PATENT COOPERATION TREATY

REC'D 21 FEB 2005
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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2997-45-PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US03/14177	International filing date *(day/month/year)* 05 May 2003 (05.05.2003)	Priority date *(day/month/year)* 03 May 2002 (03.05.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): A61k 45/00, 47/44; C12N 15/88 and US Cl.: 424/283.1; 435/458		
Applicant MARKTEK BIOSCIENCES CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of ___ sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
20 November 2003 (20.11.2003)	08 January 2005 (08.01.2005)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/ US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Deborah K. Ware Jean Proctor Paralegal Specialist Telephone No. 703-308-0196

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT	International application No. PCT/US03/14177

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed.

☒ the description:
pages 1-13 as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the claims:
pages 14-17 , as originally filed
pages NONE , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the drawings:
pages None , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages None

☒ the claims, Nos. None

☒ the drawings, sheets/~~fig~~ None

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*
*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

Form PCT/IPEA/409 (Box I) (July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/14177

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims	38-56	YES
	Claims	1-37	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-56	NO
Industrial Applicability (IA)	Claims	1-56	YES
	Claims	NONE	NO

2. CITATIONS AND EXPLANATIONS
Please See Continuation Sheet

Form PCT/IPEA/409 (Box V) (July 1998)

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims 6-35 and 42-56 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: the claims do not depend from a preceding claim in the alternative form only.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/14177

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claims 38, 42-47, and 49-55 objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims are indefinite for the following reason(s): the term "contacting" of claim 38 does not well define the meaning of "contacting" per se, therefore, the metes and bounds of the claims can not be determined.

Form PCT/IPEA/409 (Box VIII) (July 1998)

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Claims 1-37 lack novelty under PCT Article 33(2) as being anticipated by Bijl et al. (US Patent No. 6,255,505 B1).

Claims are drawn to a lipid comprising polyunsaturated fatty acid and product thereof and method of making a product thereof by adding the lipid.

Bijl et al teach a lipid comprising polyunsaturated fatty acid and product thereof and method of making a product thereof by adding the lipid. Note column 1, line 55 and column 2, lines 50-67. Also note col. 3, lines 55-56 and 64-68 and column 4, line 1, lines 29-35 and 40-45 and 64-65. Furthermore note column 5, lines 10-15 and 54-65 and column 6, lines 1-15. Also note column 7, lines 10-17 and column 7, lines 60-64, and col. 8, lines 1-20and 49-55. Further, note col. 9, lines 25-30, and 50-68 and col. 10, lines 6-10. In addition, note col. 22, lines 5-10 and Table 3, col. 23, lines 39-40 and col. 25-26, line 17 and the Table of col. 26 (note Example 22, specifically). Also note col. 27, line 59-63 and col. 28, all lines. Also see col. 29-30, all lines.

Claims are therefore, anticipated by the teachings of the reference.

Claims 1-56 lack an inventive step under PCT Article 33(3) as being obvious over Bijl et al (US Patent No. 6,255,505 B1), described above.

Claims are further drawn to method of obtaining a lipid as described above The method involves the contacting of the biomass with an enzyme which may be a lipase and protease.

Bijl et al also describe that the biomass may contain lipase and protease. Note col. 4, lines 40-45.

Although Bijl et al describe seeking to at least partially inactivate the enzymes of the broth, it is suggested that the presence of the enzymes is desired. Further, it is known and described that these enzymes are compound degrading substances. For example, lipase cleaves or breaks down lipids into smaller lipid compounds. Therefore, there is a lack of inventive step because the presence of these enzymes is known in a biomass useful for making the lipids and one of skill would have expected a successful result upon contacting the biomass with the enzymes for a process of obtaining the lipids. These claims lack an inventive step.

Claims 38-56 meet the criteria set out in PCT Article 33(2), because the prior art does not teach a process of obtaining a lipid from a biomass using the identical steps, thus, these claims are not anticipated but suggested by the reference.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Claims 1-56 meet the criteria set out in PCT Article 33(4), and thus possess industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 2997-45-1-PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2004/034965	International filing date *(day/month/year)* 22 October 2004 (22.10.2004)	Priority date *(day/month/year)*
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant MARTEK BIOSCIENCES CORPORATION		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☒	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 11 December 2007 (11.12.2007)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Dorothée Mülhausen e-mail: pt01.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	31 OCT 2007
Applicant's or agent's file reference 2997-45-1-P	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US04/34965	22 October 2004 (22.10.2004)	

International Patent Classification (IPC) or both national classification and IPC

IPC: C12P 7/64(2006.01)
USPC: 424/93.4;435/145,135,183

Applicant

MARTEK BIOSCIENCES CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	31 October 2007 (31.10.2007)	Irene Marx Telephone No. 571-272-0926

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Form PCT/ISA/237(Box No. I) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
   - ☐ paid additional fees
   - ☐ paid additional fees under protest and, where applicable, the protest fee
   - ☐ paid additional fees under protest but the applicable protest fee was not paid
   - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
   - ☐ complied with
   - ☒ not complied with for the following reasons:

   See the lack of unity section of the International Search Report(Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:
   - ☐ all parts.
   - ☒ the parts relating to claims Nos. 1-49

Form PCT/ISA/237 (Box No. IV) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 16-18,20,22-27,34-36,38-41,43-46	YES
	Claims 1-15,19,21,28-33,37,42,47-49	NO
Inventive step (IS)	Claims NONE	YES
	Claims 1-49	NO
Industrial applicability (IA)	Claims 1-49	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-15, 19, 21, 28-33, 37, 42, 47-49 lack novelty under PCT Article 33(2) as being anticipated by Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

Claims 1-49 lack an inventive step under PCT Article 33(3) as being obvious over Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

The reference differs from the claimed invention in the specific amounts recovered and in the further treatments included in the process. However, one of ordinary skill in this art would recognize that the specific amounts recovered depend largely on the specific microorganism providing the biomass and the specific culturing conditions used. In addition, the treatment of lipids with various agents, such as chelating agents, ion exchange resins and the use of refining techniques or old and well known in this art.

The process conditions discussed in the reference appears to be substantially the same as claimed. However, even if they are not, the adjustment of process conditions for optimization purposes identified as result-effective variables cited in the references would have been prima facie obvious to a person having ordinary skill in the art, since such adjustment is at the essence of biotechnical engineering.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process of Bijl *et al.* by using further well known techniques in the extraction, recovery and refining of the microbial oil for the expected benefit of maximizing the yield and providing a product suitable for human consumption.

Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

PATENT COOPERATION TREATY

RECEIVED
MAY 3 0 2001
SHERIDAN, ROSS

From the INTERNATIONAL SEARCHING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

Reviewed:
Date:
Initial:
Please return to Janice

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 2997-19-PCT	Date of Mailing *(day/month/year)* 22 MAY 2001 FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001
Applicant OMEGATECH, INC.	

1. [X] The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER TATE TERRY J. DEY PARALEGAL SPECIALIST TECHNOLOGY CENTER 1600 Telephone No. (703) 308-0196

Form PCT/ISA/220 (July 1998) ★

(See notes on accompanying sheet)

BEST AVAILABLE COPY

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 2997-19-PCT	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001	(Earliest) Priority Date *(day/month/year)* 19 JANUARY 2000
Applicant OMEGATECH, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:
   [ ] contained in the international application in written form.
   [ ] filed together with the international application in computer readable form.
   [ ] furnished subsequently to this Authority in written form.
   [ ] furnished subsequently to this Authority in computer readable form.
   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has b een furnished.
2. [X] **Certain claims were found unsearchable** (See Box I).
3. [X] **Unity of invention is lacking** (See Box II).
4. With regard to the **title**,
   [X] the text is approved as submitted by the applicant.
   [ ] the text has been established by this Authority to read as follows:
5. With regard to the **abstract**,
   [X] the text is approved as submitted by the applicant.
   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the **drawings** to be published with the abstract is Figure No. _____
   [ ] as suggested by the applicant.
   [ ] because the applicant failed to suggest a figure.
   [ ] because this figure better characterizes the invention.
   [X] None of the figures.

Form PCT/ISA/210 (first sheet) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 83
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet(1)) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :C12P 7/64, 1/04, 1/02; C12N 1/12; C12M 1/33, 3/08
US CL :435/134, 170, 171, 306.1, 946
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 435/134, 170, 171, 306.1, 946

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST, BIOSIS, CAPLUS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,179,012 A (GUDIN et al) 12 January 1993, column 2, line 37 - column 6, line 4.	1, 6, 7
Y		2-5, 8-82, 84, 85
Y	WO 98/03671 A1 (NAGASE BIOCHEMICALS, LTD.), 29 January 1998, page 2, line 32 - page 11, line 23.	1-82, 84, 85
Y	US 5,130,242 A (BARCLAY) 14 July 1992, col 4, line 52 - col 13, line 49.	1-82, 84, 85
Y	US 5,928,696 A (BEST et al) 27 July 1999, see entire document.	1-82, 84, 85
Y	US 4,720,456 A (WAGNER et al) 19 January 1988, col 1, lines 7-28.	1-82, 84, 85

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 08 MARCH 2001	Date of mailing of the international search report 22 MAY 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER TATE TERRY J. DEY PARALEGAL SPECIALIST TECHNOLOGY CENTER 1600 Telephone No. (703) 3[illegible]

Form PCT/ISA/210 (second sheet) (July 1998) *

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	5,539,133 A (KOHN et al) 23 July 1996, see column 1, line 10 - column 5, line 20.	1-82, 84, 85

Form PCT/ISA/210 (continuation of second sheet) (July 1998) *

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-46, drawn to a method of obtaining lipid from microorganisms comprising a step of lysing the microbial cells.

Group II, claim(s) 47-82, 84-85, drawn to a method of obtaining lipid from microorganisms which does not necessarily comprise a step of lysing the microbial cells.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The Group I process involves a step of lysing the microbial cells to produce a lysed cell mixture whereas the Group II process does not necessarily involve such a step. Thus, the Group II process does not share this special technical feature.

UNITED STATES RECEIVING OFFICE (RO/US) FEE CODING AND RECORDING SHEET

☐ ADD'L SHEETS

IDENTIFICATION OF THE INTERNATIONAL APPLICATION

INTERNATIONAL APPLICATION NUMBER	INTERNATIONAL FILING DATE
PCT/US01/01806	19 JANUARY 2001

APPLICANT (Name)
OMEGATECH, INC.

PAYMENTS					REFUNDS	
Payment on Filing	Deposit Account	Deposit Account	To Deposit Account	To Deposit Account
	19 1970			
Deposit Account	DATE: 08 MARCH 01	DATE:	DATE:	DATE:
☐ CASH/CHECK	☐ CASH/CHECK	☐ CASH/CHECK	☐ BY CHECK	☐ BY CHECK
150	152 210			
151				
153				
800				
801				
802				
892				
Total Paid:	Total Paid: 210	Total Paid:	Total Refunded:	Total Refunded:
States Included for 892:	892:	892:		
States Included for 893:	893:	893:		

22 MAY 2001

Date Mailed:

RO/US Authorization	RO/US Authorization	RO/US Authorization	RO/US Authorization	RO/US Authorization
Jacqueline Moore				

PCT RO/102(b) (U.S. VERSION)
(Rev. 10-82)

U.S. DEPARTMENT OF COMMERCE – Patent & Trademark Office

CHAPTER I
PCT TELEPHONE MEMORANDUM
FOR
LACK OF UNITY OF INVENTION



PCT No.: PCT/US01/01806

Examiner: CHRISTOPHER TATE

Attorney spoken to: GARY CONNELL

Date of call: 08 MARCH 2001

☒ Amount of payment approved: 210.00

☒ Deposit account number to be charged: 19-1970

☒ Attorney elected to pay for ALL additional inventions

☐ Attorney elected to pay only for the additional inventions covered by

☐ Group(s):

-- encompassing --

☐ Claim(s):

☐ Attorney elected **NOT** to pay for any additional inventions, therefore, only the first claimed invention (Group I) covered by Claim(s) _ has been searched.

☒ Attorney was orally advised that there is no right to protest for any group not paid for.

☒ Attorney was orally advised that any protest must be filed no later than 15 days from the mailing of the Search Report (PCT/ISA/210).

Time Limit For Filing A Protest

Applicant is hereby given 15 days from the mailing date of this Search Report in which to file a protest of the holding of lack of unity of invention. In accordance with PCT Rule 40.2, applicant may protest the holding of lack of unity only with respect to the group(s) paid for.

Detailed Reasons For Holding Lack Of Unity Of Invention:

Detailed Reasons For Holding Lack of Unity Of Invention:
(Continued on a separate sheet)

Note: A copy of this form must be attached to the Search Report.

USPTO/299 (August 1998) B

ATTACHMENT TO CHAPTER I PCT TELEPHONE MEMORANDUM FOR LACK OF UNITY OF INVENTION

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-46, drawn to a method of obtaining lipid from microorganisms comprising a step of lysing the microbial cells.

Group II, claim(s) 47-82, 84-85, drawn to a method of obtaining lipid from microorganisms which does not necessarily comprise a step of lysing the microbial cells.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The Group I process involves a step of lysing the microbial cells to produce a lysed cell mixture whereas the Group II process does not necessarily involve such a step. Thus, the Group II process does not share this special technical feature.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

	Date of Mailing *(day/month/year)* 22 MAY 2001
Applicant's or agent's file reference 2997-19-PCT	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001
Applicant OMEGATECH, INC.	

1. [X] The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CHRISTOPHER TATE TERRY J. DEY PARALEGAL SPECIALIST TECHNOLOGY CENTER 1600
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

Form PCT/ISA/220 (July 1998) ★ *(See notes on accompanying sheet)*

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PATENT COOPERATION TREATY

SAC/GJC

From the INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

RECEIVED
NOV 06 2007
SHERIDAN ROSS PC

PCT

COMMUNICATION IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE

Applicant's or agent's file reference 2997-45-1-P	Date of mailing (*day/month/year*) 31 OCT 2007 REPLY DUE See paragraph 1 below
International application No. PCT/US04/34965	International filing date (*day/month/year*) 22 October 2004 (22.10.2004)
Applicant MARTEK BIOSCIENCES CORPORATION	

1. ☐ REPLY DUE within _____ months/days from the above date of mailing

   ☒ NO REPLY DUE

2. COMMUNICATION:
The International Search Report and Written Opinion mailed on 26 September 2007 contains various errors including lack of indication for Box 6 of the cover sheet of the Search Report, the incorrect indication of a Y reference in box C of the Search Report, missing box IV of the Written Opinion and incorrect indication on Box V of the Written Opinion. A corrected copy is hereby attached. The response period for the International Search Report has been reset from the above Mailing Date.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Shian T. Luong Telephone No. 571-272-3700

Form PCT/ISA/224 (January 1994; reprint January 2004)

Electronic Acknowledgement Receipt	
EFS ID:	25658398
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	2715.1350003/JUK/JHH
Receipt Date:	02-MAY-2016
Filing Date:	01-JUN-2011
Time Stamp:	16:28:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Christi_etal_1986.pdf	1484064 afa1b6fa818e6af890c8a7aec4eec254eac6764f	no	11
Warnings:					
Information:					

2	Non Patent Literature	Declaration_of_Nobushige_Doisaki.pdf	470881 3b731a0c95d1f61ccd5358ab13659cb2385cc2f1	no	8
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3	Non Patent Literature	Ensanni_1987.pdf	1721948 f67d3a07897aec1c4ded4c6a1eb7203d7e3f4695	no	39
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4	Non Patent Literature	GRAS_Exemption_Claim_for_DHA_and_ARA_2001.pdf	1405640 6a6bfd91980b9708f9bfa11c7ad22eee9d67f554	no	33
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5	Non Patent Literature	EP2266525_Extended_EP_Search_dated_Nov242010.pdf	267487 a2b48ad8bb233cb272d1cc882be70b11f3d43fdf	no	7
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6	Non Patent Literature	EP1252324_ESR_dated_July_30_2004.pdf	199144 6494bc6f1b7c43b7b837c38b2360b09e851e7d45	no	5
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7	Non Patent Literature	Public_Disclosure_1997.pdf	829421 b324f53ddd99bcc43700ba8883c8f43df592b693	no	14
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11	Non Patent Literature	Hruschka_etal_1998.pdf	1442871 a7fec86f3d9391b11b6c4344cfd4d53f930c60c8	no	5
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12	Non Patent Literature	WO2003092628_WrittenOpinion_dated_July_1_2004.pdf	896799 5b498a3130abef969fa02f322fec2304249fbc36	no	18
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13	Non Patent Literature	Jagannadham_etal_1991.pdf	867727 9f111082d9a9846ffce478c386d20f3272e57491	no	7
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14	Non Patent Literature	Jin_etal_2012.pdf	444519 a89941e63b2730191f809fc37586825d9bdf6845	no	5
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15	Non Patent Literature	KR20107008702_DecisionofKRIPOfficedated120312.pdf	867810 f950b053949c3ca342aa4991e616b08175625dc0	no	21
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16	Non Patent Literature	KR1020107027153_OA_dated031011.pdf	271838 2089ef8dffd872f4fa6d51d824591ffd31fbf98e	no	8
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17	Non Patent Literature	KR1020107008702_NoticeofOpinionSubmission_081710.pdf	295464 bdaa9b3a3c73d37948acda0c675441b12c7e80e8	no	8
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18	Non Patent Literature	KIPO_TrialDecision_dated_November_30_2012_KR20107008702.pdf	867749 2c16ff7923e840172b05d24d0a1a938c3370279f	no	21
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19	Non Patent Literature	Kyle_1992.pdf	1055103 68a589d3840226d69276c73d298a7f06d6fcf136	no	23
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28	Non Patent Literature	NoticeofOpposition_EP1252324_dated_071911_EngTrans.pdf	389432 55788860f3e57e17c2e4eb6b9029b86bba683e4a	no	9
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29	Non Patent Literature	Papanikolaous_etal_2011_113_1052-1073.pdf	6954027 34fad1e56f5e94d5db12553b4dd3445f43e2b164	no	11
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30	Non Patent Literature	Pena_etal_1992_158_75-80.pdf	1087778 904c4f073b2f10afdb98288123ec4155680a34b2	no	2
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38	Non Patent Literature	Totani_etal_1992.pdf	464818 cfda4b28739fdc75414ea7ac1d26748d7aae bd49	no	9
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39	Foreign Reference	JP09000284.pdf	1069278 888a4b2d283b01e21d61c9f155791d3c76f 7fdc5	no	30
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40	Foreign Reference	JP2000-135096_EF.pdf	276241 a40533ced35b59d2a8aa1f5cc71787201c6 06b25	no	15
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42	Non Patent Literature	OA_dated_Dec_1_2008_10513 576.pdf	843252 073a0e926d3cfa98a42531b6534ea3659aa 17486	no	24
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43	Non Patent Literature	OA_dated_Dec_15_2008_1097 1723.pdf	289305 c22785ce9f2b8604aa7cf5c90ecac5dc4c2d 2f6a	no	9
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44	Non Patent Literature	OA_dated_Feb_21_2008_1097 1723.pdf	246899 bf1fd66d342e16970e461e92dfbc0bd09fd3 05b3	no	7
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45	Non Patent Literature	OA_dated_Jul_3_2007_109717 23.pdf	180523 965cd1a963009b855226a1e8925ae3a2eca 4843d	no	5
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46	Non Patent Literature	OA_dated_Jun_1_2009_10513 576.pdf	1741647 5b3eec3ebf01f70c5f6a8d365be857ac4f95 0e22	no	46
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48	Non Patent Literature	OA_dated_Mar_19_2009_10971723.pdf	135775 800f498d4f74fe1d739038c1b600f7b1fb4c37e6	no	3
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53	Non Patent Literature	WO2003092628-ISR_dated_November_3_2003.pdf	140229 577629f0f2df5dfc574e43f75f96d12dd8a0e825	no	4
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54	Non Patent Literature	WO2006046943-ISR_dated_September_26_2007.pdf	189443 c637f6fdcb5c5837f7b55703f3c758b461d0ba79	no	4
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55	Non Patent Literature	WO2001001806_IPER_dated_May_6_2002.pdf	1431668 25ea39555ef0f44105055ac960402469d67a5712	no	33
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56	Non Patent Literature	WO2001001806_IPER_dated_Sept_27_2002.pdf	1450023 f3b35a53b5af4971d8d71298350fba634858a35a	no	33
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57	Non Patent Literature	WO2003092628-IPER_dated_February_21_2005.pdf	232701 0156ce15902cf12127 4f8589ea412b8643e22fa6	no	7
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58	Non Patent Literature	WO2006046943-IPRP_dated_December_11_2007.pdf	205182 d92a9d5f60e465b4652f56a77bb4b479584f4504	no	5
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59	Non Patent Literature	WO2001001806_ISR_dated_May_22_2001.pdf	402798 f1d7c3cf0b82fa99651fad54f0da5f88cdf5ef4e	no	11
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Warnings:					
Information:					
		Total Files Size (in bytes):	60119132		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SAC / ADS

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

RECEIVED
OCT 0 1 2007
SHERIDAN, ROSS

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	26 SEP 2007
Applicant's or agent's file reference 2997-45-1-P	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US04/34965	22 October 2004 (22.10.2004)	

International Patent Classification (IPC) or both national classification and IPC

IPC: **C12P 7/64**(2006.01)
USPC: 424/93.4;435/145,135,183

Applicant

MARTEK BIOSCIENCES CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	17 August 2007 (17.08.2007)	Irene Marx Telephone No. (571) 272-0926

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 16-18, 20, 22-27, 34-36, 38-41, 43-46	YES
	Claims 1-15, 19, 21, 28-33, 37, 42, 47-49	NO
Inventive step (IS)	Claims 1-49	YES
	Claims NONE	NO
Industrial applicability (IA)	Claims 1-49	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-15, 19, 21, 28-33, 37, 42, 47-49 lack novelty under PCT Article 33(2) as being anticipated by Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

Claims 1-49 lack an inventive step under PCT Article 33(3) as being obvious over Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

The reference differs from the claimed invention in the specific amounts recovered and in the further treatments included in the process. However, one of ordinary skill in this art would recognize that the specific amounts recovered depend largely on the specific microorganism providing the biomass and the specific culturing conditions used. In addition, the treatment of lipids with various agents, such as chelating agents, ion exchange resins and the use of refining techniques or old and well known in this art.

The process conditions discussed in the reference appears to be substantially the same as claimed. However, even if they are not, the adjustment of process conditions for optimization purposes identified as result-effective variables cited in the references would have been prima facie obvious to a person having ordinary skill in the art, since such adjustment is at the essence of biotechnical engineering.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process of Bijl *et al.* by using further well known techniques in the extraction, recovery and refining of the microbial oil for the expected benefit of maximizing the yield and providing a product suitable for human consumption.

Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

Application No. Patent No.	Publication date *(day/month/year)*	Filing date *(day/month/year)*	Priority date (valid claim) *(day/month/year)*

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

Kind of non-written disclosure	Date of non-written disclosure *(day/month/year)*	Date of written disclosure referring to non-written disclosure *(day/month/year)*

Form PCT/ISA/237 (Box No. VI) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

Form PCT/ISA/237 (Supplemental Box) (April 2005)

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

(i) the claim is unchanged;
(ii) the claim is cancelled;
(iii) the claim is new;
(iv) the claim replaces one or more claims as filed;
(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers, claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1*bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

PATENT COOPERATION TREATY

RECEIVED
SEP 2 8 2001
SHERIDAN, ROSS

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

Reviewed:
Date:
Initial:
Please return to Janice

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of Mailing *(day/month/year)*	25 SEP 2001
Applicant's or agent's file reference: 2997-19-PCT	REPLY DUE within TWO months from the above date of mailing

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US01/01806	19 JANUARY 2001	19 JANUARY 2000

International Patent Classification (IPC) or both national classification and IPC
Please See Supplemental Sheet.

Applicant
OMEGATECH, INC.

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I [X] Basis of the opinion
- II [ ] Priority
- III [X] Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV [X] Lack of unity of invention
- V [X] Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI [ ] Certain documents cited
- VII [ ] Certain defects in the international application
- VIII [ ] Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension., see Rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 *bis*.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 19 MAY 2002

Name and mailing address of the IPEA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	CHRISTOPHER TATE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

Form PCT/IPEA/408 (cover sheet) (July 1998) *

WRITTEN OPINION

International application No.
PCT/US01/01806

I. Basis of the opinion

1. With regard to the elements of the international application:*

[X] the international application as originally filed

[X] the description:
pages 1-16 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

[X] the claims:
pages 17-26 , as originally filed
pages NONE , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

[X] the drawings:
pages 1 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

[X] the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

[ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

[ ] the language of publication of the international application (under Rule 48.3(b)).

[ ] the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

[ ] contained in the international application in printed form.

[ ] filed together with the international application in computer readable form.

[ ] furnished subsequently to this Authority in written form.

[ ] furnished subsequently to this Authority in computer readable form.

[ ] The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

[ ] The statement that the information recorded in computer readable form is identical to the writen sequence listing has been furnished.

4. [X] The amendments have resulted in the cancellation of:

[X] the description, pages NONE

[X] the claims, Nos. NONE

[X] the drawings, sheets/~~fig~~ NONE

5. [ ] This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*

Form PCT/IPEA/408 (Box I) (July 1998)*

WRITTEN OPINION

International application No.
PCT/US01/01806

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application.

☒ claims Nos. 83

because:

☐ the said international application, or the said claim Nos. _ relate to the following subject matter which does not require international preliminary examination *(specify)*.

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 83 are so unclear that no meaningful opinion could be formed *(specify)*.

Claim 83 is an improper multiple dependent claim under PCT Rule 6.4(a).

☐ the claims, or said claims Nos. _ are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. _.

2. A written opinion cannot be drawn due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

Form PCT/IPEA/408 (Box III) (July 1998)*

WRITTEN OPINION

International application No.
PCT/US01/01806

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees the applicant has:

- ☐ restricted the claims. (See Supplemental Sheet)
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1 not to invite the applicant to restrict or pay additional fees:

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

Form PCT/IPEA/408 (Box IV) (July 1998)*

WRITTEN OPINION

International application No.
PCT/US01/01806

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	2-5, 8-82, 84, 85	YES
	Claims	1, 6, 7	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-82, 84, 85	NO
Industrial Applicability (IA)	Claims	1-82, 84, 85	YES
	Claims	NONE	NO

2. citations and explanations

Claims 1, 6, and 7 lack novelty under PCT Article 33(2) as being anticipated by Gudin et al. (US 5,179,012).

Gudin et al. teaches a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7 (see, for example, column 2, line 37 - column 6, line 4).

Claims 1-82, 84, and 85 lack an inventive step under PCT Article 33(3) as being obvious over Gudin et al. (US 5,179,012) in view of Tanaka et al. (WO 98/03671), Barclay (US 5,130,242), Best et al. (US 5,928,696), Wagner (US 4,720,456), and/or Kohn et al. (US 5,539,133).

Gudin et al. teach a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7.

The secondary references disclose other conventional steps/procedures used to beneficially obtain lipid (for example, liposoluble components)from microorganisms/cells (see, for example, Tanaka et al: column page 2, line 32 - page 11, line 23; Barclay: column 4, line 52 - column 13, line 49; Best et al: entire document; Wagner et al: column 1, lines 8-28; Kohn et al: column 1, line 10 - column 5, line 20) including those claimed.

It would have been obvious to one of ordinary skill in the art to incorporate other onventional art-recognized steps, such as those beneficially disclosed by the secondary references, within the process taught by Gudin so as to more effectively obtained high yields of desired lipid (liposoluble components) from such microorganisms, as well as to remove undesired solvents therefrom. Claimed limitations not expressly disclosed by the above teachings, including particular properties of such lipids, would be intrinsic thereto and/or obvious based upon the cited teachings as a whole.

---------- NEW CITATIONS ----------
NONE

WRITTEN OPINION

International application No.
PCT/US01/01806

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:
IPC(7): C12P 7/64, 1/04, 1/02; C12N 1/12; C12M 1/33, 3/08 and US Cl.: 435/134, 170, 171, 306.1, 946

IV. LACK OF UNITY OF INVENTION:

1. This response is made to a telephone Lack of Unity requirement (see telephone memorandum attached hereto or attached to a prior Written Opinion).

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of Mailing *(day/month/year)*	25 SEP 2001
Applicant's or agent's file reference: 2997-19-PCT	REPLY DUE within TWO months from the above date of mailing

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US01/01806	19 JANUARY 2001	19 JANUARY 2000

International Patent Classification (IPC) or both national classification and IPC
Please See Supplemental Sheet.

Applicant
OMEGATECH, INC.

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I [X] Basis of the opinion
- II [ ] Priority
- III [X] Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV [X] Lack of unity of invention
- V [X] Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI [ ] Certain documents cited
- VII [ ] Certain defects in the international application
- VIII [ ] Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension., see Rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 *bis*.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 19 MAY 2002

Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CHRISTOPHER TATE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

Form PCT/IPEA/408 (cover sheet) (July 1998) *

Electronic Acknowledgement Receipt	
EFS ID:	25658693
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	2715.1350003/JUK/JHH
Receipt Date:	02-MAY-2016
Filing Date:	01-JUN-2011
Time Stamp:	16:37:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20160502_IDS_3_28612_US_NP.pdf	633672 698306190ef9bf3c6607d6c53c0d5e7e987fe359	no	0
Warnings:					
Information:					

2	Non Patent Literature	WO2006046943_WrittenOpinion_dated_Sept_26_2007.pdf	227322 331b4225a5fb80b7e271552c55f724684e188c4b	no	6
Warnings:					
Information:					
3	Non Patent Literature	WO2001001806_WrittenOpinion_dated_Sept_25_2001.pdf	247381 b73422e2f8c1bfbb54c64afc062e35f2eea99740	no	7
Warnings:					
Information:					
4	Non Patent Literature	Wynn_etal_1999.pdf	532416 7763b422f1e37c285ca4f040a8b5d252d2ff1b12	no	7
Warnings:					
Information:					
5	Non Patent Literature	Zhan_etal_1999.pdf	340112 8b5587656669da293514a6aea5104dd6702cd0e1	no	7
Warnings:					
Information:					
6	Non Patent Literature	Zhang_etal_2011_pgs281-284.pdf	739594 25be6e20ce1e183d15a41a104cbed026661b222e	no	4
Warnings:					
Information:					
7	Non Patent Literature	Zhang_etal_2011_pgs1934-1941.pdf	1008315 d58d505bbdbb1070d9aba414d16d0b202fa0e218	no	8
Warnings:					
Information:					
8	Non Patent Literature	Ellenbogen_etal_1969_EF.pdf	1612703 4b16ed8cc1b61deec47cd2b5c38799ebb0067433	no	7
Warnings:					
Information:					
9	Non Patent Literature	Sawayama_etal_1999_EF.pdf	103575 b4bfa1b43fbdb91ff2af28f886adb217c744fca1	no	7
Warnings:					
Information:					
10	Non Patent Literature	Zhang_etal_1999_EF.pdf	371882 ad62428f9cb1ce8e4f29b7c057ce8f2c17c89655	no	5
Warnings:					
Information:					

Total Files Size (in bytes):	5816972

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	2715.1350003/JUK/JHH	4148

109143 7590 07/21/2016

DSM Services USA
6480 Dobbin Road
Columbia, MD 21045

EXAMINER
CARR, DEBORAH D

ART UNIT	PAPER NUMBER
1672	

NOTIFICATION DATE	DELIVERY MODE
07/21/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

dsmna.ip@dsm.com

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 13/151,014	Applicant(s) CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1672	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *2 May 2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1 -4,6,8,31 -33,39,41,44-47,49,50,52-58 and 63-78* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1 -4,6,8,31 -33,39,41,44-47,49,50,52-58 and 63-78* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 6 January 2016 has been entered.

Notice of Pre-AIA or AIA Status

2. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 112

3. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 1 reads as follows, "A process for obtaining a lipid from a cell composition, comprising:

(a) lysing a cell of said cell composition to form a lysed cell composition;

(b) demulsifying said lysed cell composition to form a demulsified cell composition;

(c) separating said lipid from the demulsified cell composition; and

(d) harvesting said lipid;

wherein (b) comprises heating said lysed cell composition to a temperature of at least 70°C."; claims 2-4, 6, and 8 all read on further limiting step (b) of said claim 1.

Claims 2-4 uses the word "further" which renderers these claims and those that depend from them indefinite. In step (b), the lysed cell composition is demulsified to form a demulsified cell composition. It is unclear wherein the 1st base, 2nd base, and the salt are added to the cell composition. As used in these claims the word further is defined as follows, "additional to what already exists or has already taken place, been done, or been accounted for".

If they are to be added after the lysed cell composition has been demulsified, then the claims should be amended to reflect that these reagents are added to the demulsified cell composition.

If they are added prior to the demulsification, then the claims should be amended to reflect that these reagents are added to the lysed cell composition prior to demulsifying and removing the word "further".

If these reagents are in fact being used as the demulsification agent, then the claims should be amended to reflect that this is how demulsification is being accomplished.

Claims 31-33 are rendered indefinite for the same reasons listed supra. The process steps listed must occur prior than the lysing step since it is done on the cell or cell composition. The word "further" implies it happens after the lysing step. Claim 33 concentrates the lysed cell composition but is it unclear if this happens before step (b) but after step (a) or prior to step (a).

Claims 64-66 are rendered indefinite for the same reasons listed supra. The word "further" implies it happens after the demulsification wherein it's a demulsified cell composition not a lysed cell composition, or after the cell composition has been lysed.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim(s) 1, 31, 33, 63-78 is/are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by Kobzeff et al. (US Pub. 2006/0099693).

US Pub'693 teaches a method for liberating a lipid from a biomass comprising liberating the lipid at a temperature of about 10 C to about 80 C at a pH level of from about pH 5 to about pH 9. This method is conducted in the substantial absence of an extraction solvent. If the lipid from the above step is in the form of an emulsion, this product can be used "as is" or dried and used or treated to release the lipid from the emulsion [See: sect. 0012, sect. 0014, sect. 0020-0021, sect. 0028-0029, sect. 0031, sect.0036].

Claim Rejections - 35 USC § 103

3. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 52, 54-57 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Dueppen (US Pub. 2005/0115897).

As to Claim 52, US Pub'897 discloses an extracted microbial lipid (abstract: para (0011)) comprising a triglyceride fraction of at least 70% by weight (para [0035]). US Pub'897 discloses

therein the triglyceride fraction comprises docosahexaenoic acid (para [0011]). US Pub'897 discloses wherein the docosapentaenoic acid n-6 content of the triglyceride fraction (para [0010], (0011]) is from at least 0.5% by weight to 6% by weight (para [0056]), and wherein the oil has an anisidine value of 26 or Jess (para [0067], Table 5).

US Pub'897 does not specifically disclose wherein the DHA content is at least 50% by weight. However, US Pub'897 teaches wherein the lipid are preferably at least 85% triglyceride (para [00351]. and wherein 'preferred attributes of the process include the selective recovery of only LCPUFA-containing triglycerides at the expense of trisaturated glycerides' (para [0038]). It would have been obvious to a person skilled in to obtain a DHA content of at least 50 wt% from a DHA-producing microbe, based upon the teaching of US Pub'897.

As to Claim 54, US Pub'897 discloses an extracted microbial lipid (abstract; para [0011]) comprising a triglyceride fraction of at least 70% by weight (para [0035]). US Pub'897 disdoses wherein the docosahexaenoic acid content of the triglyceride fraction (para [0011]) and wherein the oil has an anisidine value of 26 or less (para [0067], Table 5). US Pub'897 does not disclose an embodiment where DHA content is at least 60% by weight. However, US Pub'897 teaches wherein the lipid are preferably at least 85% triglyceride (para (0035]), and wherein ' preferred attributes of the process include the selective recovery of only LCPUFA-containing triglycerides at the expense of trisaturated glycerides• (para (0038]). It would have been obvious to a person skilled in to obtain a DHA content of at least 60 wt% from a DHA· producing microbe based upon the teaching of US Pub'897.

As to Claim 55, US Pub'897 discloses wherein the oil has a peroxide value of 5 or less (para [0064], Table 2).

5. Claim 53 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Dueppen (US Pub. 2005/0115897) in view of METZ et al (US Pub. 2008/0148433).

As to Claim 53, US Pub'897 discloses an extracted microbial lipid (abstract; para [0011]) comprising a triglyceride fraction of at least 70% by weight (para [0035]). US Pub'897 discloses wherein the triglyceride fraction comprises docosahexaenoic acid (para [0011]). US Pub'897 discloses wherein the docosapentaenoic acid n-6 content of the triglyceride fraction (para [0010], [0011]) is from at least 0.5% by weight to 6% by weight (para [0056]), and wherein the oil has an anisidine value of 26 or less (para [0067], Table 5). US Pub'897 discloses a ratio of DHA to DPA of about 3:1 (para [0040]), but does not explicitly disclose wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1.

Metz teaches plants engineered to produce at least two target PUFAs (e.g., DHA and DPAn-6) at desired ratios ('In one aspect. the plant produces DHA and DPAn-6 (the products of a PUFA PKS system described herein). and the ratio of DHA to DPAn-6 is from about 1:10 to about 10:1, including any ratio in between. In a one embodiment, the ratio of DHA to DPA is from about 1:1 to about 3:1, and in another embodiment, about 2.5:1 "; para [0220]).

It would have been obvious to a person skilled in the art to use the specific PUFA-producing processes of Metz to adjust the DHA produced in a microbe as taught by US Pub'897 in order to achieve a DHA:DPA ratio of 6:1 or greater, In order to produce a specifically DHA-rich product.

6. Claims 39, 41, 44-47, 49-50 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Fichtali et al.

Claim(s) 39, 41, 44-47, 49-50 is/are product-by-process claims. M.P.E.P. § 2113 reads, "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps."

"Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

The use of 35 U.S.C. §§ 102 and 103 rejections for product-by-process claims has been approved by the courts. "[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of

processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

US Pub'791 relates to a polyunsaturated fatty acid-containing oil product and uses thereof, such as in a solid fat composition that includes a microbially-derived long chain polyunsaturated fatty acid. The claims differs in that an aroma level is given for the oil.

However it would have been obvious to one of ordinary skill in the art to extrapolate based on the data given in the examples, to deem that the oil exhibited no odor.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBORAH D. CARR whose telephone number is (571)272-0637. The examiner can normally be reached on Monday-Friday 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fereydoun Sajjadi can be reached on 571-272-3311. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEBORAH D CARR/
Primary Examiner

Art Unit 1672

Ddc

Notice of References Cited	Application/Control No. 13/151,014	Applicant(s)/Patent Under Reexamination CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1672	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2006/0099693 A1	05-2006	Kobzeff; Joseph M.	A23D9/00	435/134
*	B	US-2008/0148433 A1	06-2008	Metz; James G.	C07K14/21	800/281
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

CPC- SEARCHED		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016	DDC
C11B3/02	9/2015, 1/2016, 7/2016	DDC
C11B3/16	9/2015, 1/2016, 7/2016	DDC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016	ddc
435	134	8/2014, 1/2016, 7/2016	ddc

SEARCH NOTES		
Search Notes	Date	Examiner
see transcript	8/2014	ddc
updated search	1/2015	ddc
updated search	9/2015	ddc
updated search	1/2016	ddc
updated search	7/2016	ddc

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/DEBORAH D CARR/ Primary Examiner.Art Unit 1672

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
435	134	8/2014	ddc
554	8, 223, 224, 227	8/2014	ddc
see areas searched		9/2015, 1/2016	ddc

	/DEBORAH D CARR/ Primary Examiner.Art Unit 1672

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016			
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	34	÷	-	-	-	-	-			
	35	÷	-	-	-	-	-			
	36	÷	-	-	-	-	-			

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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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	71		=	=	=	=	✓			
	72		=	=	=	=	✓			

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016			
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	74		=	=	=	=	✓			
	75		=	=	=	=	✓			
	76		=	=	=	=	✓			
	77		=	=	=	=	✓			
	78		=	=	=	=	✓			

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Courtesy Reminder for
Application Serial No: 13/151,014

Attorney Docket No: 2715.1350003/JUK/JHH
Customer Number: 109143
Date of Electronic Notification: 07/21/2016

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:
dsmna.ip@dsm.com

To view your correspondence online or update your email addresses, please visit us anytime at **https://sportal.uspto.gov/secure/myportal/privatepair.** If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 4148
Cherinko et al.	Art Unit: 1672
Appl. No.: 13/151,014	Examiner: CARR, DEBORAH D.
Filed: June 1, 2011	Atty. Docket: 28612-US-NP

For: **EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM**

Reply and Amendment

Mail Stop Amendment

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the non-final Office Action dated July 21, 2016, Applicants submit the following amendments and remarks.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A process for obtaining a lipid from a cell composition, comprising:
(a) lysing a cell of said cell composition to form a lysed cell composition;
(b) demulsifying said lysed cell composition to form a demulsified cell composition, wherein the demulsifying comprises contacting said lysed cell composition with a first base to raise the pH of the lysed cell composition to 8 or above;
(c) separating said lipid from the demulsified cell composition; and
(d) harvesting said lipid;
wherein (b) comprises heating said lysed cell composition to a temperature of at least 70° C.

2. (Cancelled)

3. (Currently Amended) The process of claim 2, wherein (b) ~~further~~ comprises contacting said lysed cell composition with a second base to raise the pH of the lysed cell composition to 7 or above to demulsify the cell composition.

4. (Currently Amended) The process of claim 1, wherein (b) ~~further~~ comprises contacting said lysed cell composition with a salt to demulsify the cell composition.

5. (Cancelled)

6. (Previously Presented) The process of claim 4, wherein the salt is added in an amount of 0.1% to 20% by weight of the lysed cell composition.

7. (Cancelled).

8. (Previously Presented) The process of claim 4, wherein the salt is selected from: alkali metal salts, alkali earth metal salts, sulfate salts, and combinations thereof.

9-30. (Cancelled)

31. (Currently Amended) The process of claim 1, ~~further~~ comprising washing the cell or cell composition prior to (a).

32. (Currently Amended) The process of claim 1, ~~further~~ comprising pasteurizing the cell or cell composition prior to (a).

33. (Currently Amended) The process of claim 1, ~~further~~ comprising concentrating the lysed cell composition prior to (a).

34-38. (Cancelled)

39. (Previously Presented) A lipid obtained by the process of claim 1, wherein the lipid has an overall aroma intensity of 3 or less.

40. (Cancelled)

41. (Previously Presented) The lipid of claim 39, wherein the lipid comprises at least 35% by weight docosahexaenoic acid.

42. (Cancelled)

43. (Cancelled)

44. (Previously Presented) The lipid of claim 39, wherein the lipid has an anisidine value of 26 or less.

45. (Previously Presented) The lipid of claim 39, wherein the lipid has a phosphorus content of 100 ppm or less.

46. (Previously Presented) The lipid of claim 39, wherein the lipid has a peroxide value of 5 or less.

47. (Original) The lipid of claim 39, comprising at least 20% by weight eicosapentaenoic acid and less than 5% by weight each of arachidonic acid, docosapentaenoic acid n-6, oleic acid, linoleic acid, linolenic acid, eicosenoic acid, erucic acid, and stearidonic acid.

48. (Cancelled)

49. (Previously Presented) The lipid of claim 47, wherein the lipid has a peroxide value of 5 or less.

50. (Previously Presented) The lipid of claim 39, wherein the lipid is a crude oil.

51. (Cancelled)

52. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

53. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

54. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weigh of an organic solvent.

55. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a peroxide value of 5 or less.

56. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a phosphorus content of 100 ppm or less.

57. (Previously Presented) The extracted microbial lipid of claim 52, wherein the lipid is a crude oil.

58. (Previously Presented) A process for obtaining a lipid, the process comprising refining a crude lipid of claim 50.

59-62. (Cancelled)

63. (Previously Presented) The process of claim 1, wherein (b) comprises heating said lysed cell composition to a temperature of from 70° C to 100° C.

64. (Currently Amended) The process of claim 1, wherein (b) ~~further~~ comprises agitating the lysed cell composition to demulsify the cell composition.

65. (Currently Amended) The process of claim 1, wherein (a) ~~further~~ comprises adding a salt to said cell composition to demulsify the cell composition.

66. (Currently Amended) The process of claim 1, wherein (a) comprises raising the pH of said cell composition to 8 or above to demulsify or lyse the cell composition.

67. (Previously Presented) The process of claim 1, wherein the lysed cell composition is in the form of an oil-in-water emulsion comprising a mixture of a continuous aqueous phase and a dispersed lipid phase.

68. (Previously Presented) The process of claim 1, wherein (c) comprises centrifuging the demulsified cell composition.

69. (Previously Presented) The process of claim 1, wherein the lipid is a crude lipid.

70. (Previously Presented) The process of claim 69, further comprising (e) refining said crude lipid to obtain a refined lipid.

71. (Previously Presented) The process of claim 1, wherein said lipid has an anisidine value of 26 or less.

72. (Previously Presented) The process of claim 1, wherein said lipid has a peroxide value of 5 or less.

73. (Previously Presented) The process of claim 1, wherein said cell is a microbial cell.

74. (Previously Presented) The process of claim 73, wherein said microbial cell is of the genus *Thraustochytrium*, *Schizochytrium*, or mixtures thereof.

75. (Previously Presented) The process of claim 1, wherein said lipid comprises omega 3 and/or omega-6 polyunsaturated fatty acids.

76. (Previously Presented) The process of claim 1, wherein said lipid comprises at least one of DHA, DPA(n-3), DPA(n-6), EPA, and ARA.

77. (Previously Presented) The process of claim 1, wherein an organic solvent is not added to said cell composition, said lysed cell composition, or said lipid in an amount or concentration sufficient to extract said lipid from said cell.

78. (Previously Presented) The process of claim 1, wherein the lipid contains less than 5% by weight of an organic solvent.

Remarks

After entry of the above amendments, the claims pending in the subject application are 1, 3-4, 6, 8, 31-33, 39, 41, 44-47, 49, 50, 52-58 and 63-78. Claims 2-4, 31-33 and 64-66 have been amended. No new matter has been added by these amendments.

Reconsideration of this application based on the Amendments and Remarks presented herein is respectfully requested.

Rejections under 35 U.S.C. §112

Claims 2-4, 31-33 and 64-66 have been rejected under 35 U.S.C. §112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

Claims 2-4, 31-33 and 64-66 have been amended to address this rejection. Applicants submit that claims 2-4, 31-33 and 64-66 are not indefinite and request that this rejection be withdrawn.

Rejections under 35 U.S.C. §102(b)

A. Claims 1, 31, 33, 63-78 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Publication No. 2006/0099693 to Kobzeff et al. ("Kobzeff").

Claim 1 has been amended to include dependent claim 2, which was not included in this rejection. Specifically, claim 1 has been amended to include in (b), wherein the demulsifying comprises contacting said lysed cell composition with a first base to raise the pH of the lysed cell composition to 8 or above. Kobzeff does not include raising the pH of the lysed cell composition to 8 or above to demulsify the cell composition.

Applicants submit that independent claim 1 and dependent claims therefrom are not anticipated by Kobzeff and request that this rejection be withdrawn.

Rejections under 35 U.S.C. §103(a)

A. Claims 52 and 54-57 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 2005/0115897 to Dueppen et al. ("Dueppen").

Claim 52 is directed to an extracted microbial lipid comprising a triglyceride (TG) fraction of at least 70% by weight, wherein the docosahexaenoic acid (DHA) content of the TG fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 (DPA n-6) content

of the TG fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% organic solvent.

The Examiner states Dueppen discloses an extracted microbial lipid comprising a triglyceride (TG) fraction of at least 70% by weight, wherein the TG fraction comprises docosahexaenoic acid (DHA), docosapentaenoic acid n-6 (DPA n-6) from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of less than 26 but does not disclose wherein the DHA content is at least 50% by weight. Based on paragraphs [0035] and [0038] of Dueppen, the Examiner states it would have been obvious to one of ordinary skill in the art at the time the invention was made to obtain a DHA content of at least 50 wt.% from a DHA-producing microbe.

One of ordinary skill in the art would not look to Dueppen for preparation of a composition comprising a triglyceride fraction wherein the DHA is at least 50% by weight and the DPA n-6 is from at least 0.5-6% and having less than 5% organic solvent. The Examiner cites paragraph [0056] as disclosing DPA n-6 in an amount from at least 0.5% by weight to 6% by weight. In example 1, a sample of unwinterized DHA-rich liquid was pulled from frozen storage. It was subjected to "acetone winterization" (*see*, [0054]) in which a portion of the sample was put in a flask and cold acetone was added. The sample was filtered, and the solid fraction washed with cold acetone and dried. The "lipid/acetone" fraction resulting from the filtration was concentrated to produce an orange-colored liquid. Both the solid fraction and the lipid/acetone fraction were analyzed by FAME for their fatty acid profile. FAME analysis measures fatty acid profile and does not analyze lipid class profile, which would show the quantitative value of the lipid composition (including triglycerides). As disclosed in [0056], the solid fraction had very little DHA (2.4%) and DPA n-6 (0.9%). In contrast to Dueppen, the present invention comprises a triglyceride fraction wherein the DHA is at least 50% by weight and the DPA n-6 is from at least 0.5-6%.

Dueppen relates to production of a lipid composition. The solid fraction in Dueppen, although containing minor amounts of lipids, is not the lipid composition which is the targeted inventive concept of Dueppen. In fact, Dueppen explicitly refers to the portions of the sample in Example 1 after winterization as a "solid fraction" and not as the "lipid/acetone fraction". The sample cited by the Examiner for the amount of DPA n-6 is not the lipid-containing fraction of Dueppen. The amount of DHA and DPA n-6 contained in the sample in Dueppen is 2.4% and 0.9%, respectively. One of skill in the art would not look to Dueppen to produce a lipid composition having at least 50% DHA and from at least 0.5-6% DPA n-6, as the solid

fraction containing 2.4% DHA and 0.9% DPA n-6 is not the lipid composition. Even if one of ordinary skill in the art would look to the non-lipid-containing fraction (which position Applications do not support), the DHA amount found in the solid fraction is at least 20 times greater in the present application than that in Dueppen. The amount of DHA and DPA n-6 in the lipid/acetone fraction is 41% and 16%, respectively. One of ordinary skill in the art would not look to Dueppen, particularly the lipid/acetone fraction, as the amount of DPA n-6 is much greater than that of the present invention.

Further, Dueppen is a process for purifying a lipid composition having predominantly neutral lipid components wherein the process employs contacting the lipid composition with a polar solvent. Example 1 explicitly discloses use of a polar solvent (acetone) for purification of a lipid composition. From the use of acetone, which is an organic solvent, one of skill in the art would not look to Dueppen for a composition having less than 5% organic solvent.

Applicants therefore respectfully submit that as the solid fraction the Examiner cites in his rejection to show the DPA n-6 levels is not a lipid composition and as Dueppen discloses production of a lipid composition, in which the lipid-acetone fraction shows significantly higher levels of DPA n-6 than in the present application, and also discloses use of a polar solvent for purification of the lipid-containing fraction, Dueppen actually teaches away from the present invention and one of skill in the art would not look to Dueppen to produce a composition wherein the DHA is at least 50% by weight and the DPA n-6 is from at least 0.5-6% and has less than 5% organic solvent.

Claim 54, as amended, is directed to an extracted microbial lipid comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weigh of an organic solvent.

The Examiner states Dueppen discloses an extracted microbial lipid comprising a TG fraction of at least 70% by weight, wherein the DHA content of the TG fraction, wherein the oil has a peroxide value of 5 or less and wherein the oil has an anisidine value of 26 or less but does not disclose wherein the DHA content is at least 60% by weight. Based on paragraphs [0035] and [0038] of Dueppen, the Examiner states it would have been obvious to one of ordinary skill in the art at the time the invention was made to obtain a DHA content of at least 60 wt.% from a DHA-producing microbe.

One of ordinary skill in the art would not look to Dueppen for preparation of a composition comprising a triglyceride fraction wherein the DHA is at least 60% by weight and

has less than 5% organic solvent. In example 1, a sample of unwinterized DHA-rich liquid was pulled from frozen storage. It was subjected to "acetone winterization" (*see*, [0054]) in which a portion of the sample was put in a flask and cold acetone was added. The sample was filtered, and the solid fraction washed with cold acetone and dried. The "lipid/acetone" fraction resulting from the filtration was concentrated to produce an orange-colored liquid.

Dueppen is a process for purifying a lipid composition having predominantly neutral lipid components wherein the process employs contacting the lipid composition with a polar solvent. Example 1 explicitly discloses use of a polar solvent (acetone) for purification of a lipid composition.

Applicants therefore respectfully submit that as Dueppen discloses use of a polar solvent for purification of the lipid-containing fraction, Dueppen actually teaches away from the present invention and one of skill in the art would not look to Dueppen to produce a composition wherein the DHA is at least 60% by weight and has less than 5% organic solvent.

Applicants submit that independent claims 52 and 54 and dependent claims therefrom are not unpatentable over Dueppen and request that this rejection be withdrawn.

B. Claim 53 is rejected under 35 U.S.C. §103(a) as being unpatentable over Dueppen in view of U.S. Publication No. 2008/0148433 ("Metz").

Claim 53 is directed to an extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

As discussed in the arguments above, one of ordinary skill in the art would not look to Dueppen to produce a composition having at least 50% DHA and from at least 0.5-6% DPA n-6 and having less than 5% of an organic solvent. Metz is cited for disclosure of the ratio of DHA and DPA n-6. Metz does not cure the deficiencies of Dueppen.

Applicants submit that independent claim 53 is not unpatentable over Dueppen in view of Metz and request that this rejection be withdrawn.

C. Claims 39, 41, 44-47 and 49-50 are rejected under 35 U.S.C. §103(a)) as being unpatentable over U.S. Publication No. 2008/0107791 to Fichtali et al. ("Fichtali").

The Examiner states claims 39, 41, 44-47 and 49-50 are product-by-process claims and that MPEP §2113 reads, "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps." Further, the Examiner states Fichtali relates to a polyunsaturated fatty acid-containing product and uses thereof, such as in a solid fat composition that includes a microbially-derived long chain polyunsaturated fatty acid and the claims differ in that an aroma oil is given for the oil but that it would be obvious to one of skill in the art to extrapolate based on the data given in the examples to deem that the oil exhibited no odor.

Applicants respectfully submit that claim 39 does not claim that the oil does not have any odor, rather that it has an aroma intensity value of less than 3, which is not the same as claiming there is no odor in the oil. As described in the present application, the term "overall aromatic intensity" refers to the gustatory, or taste, sensory rating given to the lipid by a panel of sensory analysts. In some embodiments, the Universal Spectrum descriptive analysis method is used to assess the aroma and aromatic characteristics of samples. This method uses an intensity scale of 0 - 15, where 0 = none detected and 15 = very high intensity, to measure the aroma and aromatic attributes of the oils. As shown in Table 10 of the present application, certain aroma and aromatic characteristics, such as fishy marine complex, green complex, herbaceous, nutty roasted, painty and other aromas and aromatics were measured. There is no teaching, suggestion or motivation in Fichtali that the oils had aroma or aromatic characteristics. Additionally, the oils disclosed in the examples in Fichtali have all been deodorized with the addition of antioxidants, in contrast to the oils in the present application. Such deodorization and antioxidant addition would cause less oxidation to occur, but does not necessarily mean that the aroma intensity level would be less than 3, as claimed in claim 39. One of skill in the art would therefore not look to Fichtali to arrive at the present invention, wherein the oil produced by the process of claim 1 has an aroma intensity level of less than 3. Applicants submit that independent claim 39 and claims dependent therefrom are not unpatentable over Fichtali and request that this rejection be withdrawn.

Conclusion

Prompt and favorable consideration of this Reply and Amendment is respectfully requested. Applicants believe the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

The Commissioner is hereby authorized to charge any deficiency in fees or credit any over payment to deposit account No. 50-5958, referencing attorney docket No. 28612-US-NP.

Respectfully submitted,

/Shannon McGarrah/

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6480 Dobbin Road
Columbia, Maryland 21045
443-542-2395

Date: October 21, 2016

Electronic Acknowledgement Receipt	
EFS ID:	27291404
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	2715.1350003/JUK/JHH
Receipt Date:	21-OCT-2016
Filing Date:	01-JUN-2011
Time Stamp:	17:42:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Arguments/Remarks Made in an Amendment	20161021_Reply_NFOA_28612-US-NP.pdf	142486 378757974 5d14b66d229a8e94feabafc5e5a39cd	no	12
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/151,014	Filing Date 06/01/2011	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	10/21/2016	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 39	Minus	** 42	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***6	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevar Figures Appear
	1	4680314		1987-07-14	Microbio Resources Inc.	
	2	4857329		1989-08-15	Agency of Industrial Science & Technology	
	3	5476787		1995-12-19	Director-General of Agency of Industrial Science a	
	4	5951875		1999-09-14	Eastman Chemical Company	
	5	6180376	B1	2001-01-30	Zeneca Limited	
	6	7527734	B1	2009-05-05		
	7	8192628	B2	2012-06-05	Sapphire Energy Inc.	

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	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevar Figures Appear
	1	20020037303	A1	2002-03-28		
	2	20030054084	A1	2003-03-20		
	3	20070213298		2007-09-13	Universitetet 1 Oslo	
	4	20080020124	A1	2008-01-24		
	5	20080206379	A1	2008-08-28		
	6	20090221705		2009-09-03		
	7	20090275658	A1	2009-11-05		
	8	20100069492	A1	2010-03-18	Photonz Corporation Ltd	
	9	20100226977		2010-09-09		
	10	20100239712	A1	2010-09-23	Solazyme Inc.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

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	12	20110159167	A1	2011-06-30		
	13	20110179699	A1	2011-07-28	ENI SPA	
	14	20110201063	A1	2011-08-18		
	15	20110251278	A1	2011-10-13	Feyecon B.V.	
	16	20120022278	A1	2012-01-26	Sapphire Energy Inc.	
	17	20120036767	A1	2012-02-16		
	18	20120040428	A1	2012-02-16		
	19	20120040443	A1	2012-02-16	Alfa Laval Corporate AB	
	20	20120135479	A1	2012-05-31	Solazyme Inc.	
	21	20130129775	A1	2013-05-23	Heliae Development LLC	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	22	20160002566	A1	2016-01-07	Commonwealth Scientific and Industrial Research Or	

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	1	CN101985637	CN	A	2011-03-16	Cargill Alking BioEngineering Wuhan Co Ltd		
	2	EP1905309A1	EP	A1	2008-04-02	SemBioSys Genetics Inc.		
	3	WO20010076385	WO		2001-10-18	WEST-FALIA SEPARATOR INDUSTRY GMBH		
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	5	WO2003092628	WO	A2	2003-11-13	Martek Biosciences Corporation		
	6	WO2006046943	WO		2006-05-04	Martek Biosciences Corporation		
	7	WO2006128244	WO	A1	2006-12-07	McFarlane Marketing Pty Ltd		
	8	WO2008130372	WO	A2	2008-10-30	Microbia Precision Engineering		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	9	WO2008151373	WO	A1	2008-12-18	Fuji Fuels Pty Ltd		
	10	WO2009605278	WO		1996-02-22	Dr. Frische GmbH		
	11	WO2010006765	WO		2010-01-21	Lonza Ltd		
	12	WO2010096002	WO	A1	2010-08-26	Alfa Laval Corporate AB		
	13	WO2010138620	WO	A1	2010-12-02	Solazyme Inc.		
	14	WO20120054404	WO	A2	2012-04-26	Originoil Inc.		
	15	WO20120109642	WO	A1	2012-08-16	Phycal Inc.		
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	17	WO2012109642	WO	A1	2012-08-16	Physcal Inc.		
	18	WO2013040732	WO	A1	2013-03-28	Xiamen Huison Biotech Co. Ltd.		
	19	WO2014004999	WO	A1	2014-01-03	BP Biofuels UK Limited		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	20	WO2015092544	WO	A1	2015-06-25	DSM Nutritional Products AG		
	21	WO2015095462	WO	A1	2015-06-25	BP Biofuels UK Limited		
	22	WO2015095688	WO	A1	2015-06-25	DSM IP Assets B.V.		
	23	WO2015095690	WO	A2	2015-06-25	DSM IP Assets B.V.		
	24	WO2015095693	WO	A2	2015-06-25	DSM IP Assets B.V.		
	25	WO2015095694	WO	A1	2015-06-25	DSM IP Assets B.V.		
	26	WO2015095696	WO	A1	2015-06-25	DSM IP Assets B.V.		

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T
	1	BALDAUF, S.M., BOOK, Am. Nat., 1999, 154, S178	
	2	MERCER, PAULA ET AL., Developments in oil extraction from microalgae, Eur. J. Lipid Sci. Technol., 2011, 1-9	

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	3	WIPO, WO2006046943 Communication in which no other form available, dated October 31 2007, 2007	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent docum [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark he English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) f the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2016-12-06
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by t public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advise that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicite is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information A (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need f the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursua to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, o his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:	13151014			
Filing Date:	01-Jun-2011			
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom			
First Named Inventor/Applicant Name:	Stephen Robert Cherinko			
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray			
Attorney Docket Number:	28612-US-NP			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	27712971
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	06-DEC-2016
Filing Date:	01-JUN-2011
Time Stamp:	17:30:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$180
RAM confirmation Number	120716INTEFSW00005294505958
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	EP1905309.pdf	1930859 9a4a38e69a581bc735c86ed5a02fa47c3c0b2634	no	22
Warnings:					
Information:					
2	Foreign Reference	WO0176385.pdf	780110 7f3fa3d008a5632ebea408e112580a2c4439693a	no	19
Warnings:					
Information:					
3	Foreign Reference	WO0176715.pdf	1311111 7cc58e39ee389ba4b3dcc37bbe1f10643f2da53d	no	26
Warnings:					
Information:					
4	Foreign Reference	WO06046943.pdf	1614013 e1a68e9c0659ffb7e2bd381ef541db96708e366d	no	30
Warnings:					
Information:					
5	Foreign Reference	WO06128244.pdf	2096729 10ef57312530b3a0eb1392977469cc3e069c22e3d	no	49
Warnings:					
Information:					
6	Foreign Reference	WO08151373.pdf	1737078 9f0ad15b2ee9c267aaf1d86b1beee55bb270e508	no	48
Warnings:					
Information:					

7	Foreign Reference	WO9605278.pdf	1467140 00b035e67840992c46426b53cd3314d3c58a56b7	no	41
Warnings:					
Information:					
8	Foreign Reference	WO10006765.pdf	755832 53dfab98d69db06888623d0935b83d6b83d9359b	no	19
Warnings:					
Information:					
9	Foreign Reference	WO10096002.pdf	1035437 16b69bec2e3173fbb66ce46610cac15fa94064a9	no	23
Warnings:					
Information:					
10	Foreign Reference	WO10138620.pdf	8852596 d706b696566f949a37b68178baae6fc4e18fb4396	no	149
Warnings:					
Information:					
11	Foreign Reference	WO12054404.pdf	3314597 aad7b5fc57ee6bd8db1f479ccd0c318ddf2d325e	no	82
Warnings:					
Information:					
12	Foreign Reference	WO12109642.pdf	3501571 1d5c70e7af1bb435b41775c879bd6ad3563c97c3	no	43
Warnings:					
Information:					
13	Foreign Reference	WO12078852.pdf	3764038 da14badf58aefb724290b7d81294e057a90995ce	no	76
Warnings:					
Information:					

14	Foreign Reference	WO14004999.pdf	301508 ee506c799e7ff11becf3cbac31284d852329c9eb	no	26
Warnings:					
Information:					
15	Foreign Reference	MTCN101985637.pdf	476144 d5a2d59ad830793691eb559bd9d91f148f74d6e5	no	11
Warnings:					
Information:					
16	Foreign Reference	WO08130372.pdf	50193 2d4dc1895f93a9409d439abf00f53e371357b6e3	no	1
Warnings:					
Information:					
17	Foreign Reference	WO13040732.pdf	604632 72665d1eb1e8480df81722588e1c77e5ffad463c	no	16
Warnings:					
Information:					
18	Foreign Reference	WO15095462.pdf	1793690 f22583f5048bb6ba566d5728d04c1d440611 8b2cd	no	50
Warnings:					
Information:					
19	Foreign Reference	WO15092544.pdf	944529 23b677dbfbf875deabcc71eabc7b2bb5d6f28156	no	33
Warnings:					
Information:					
20	Foreign Reference	WO15095688.pdf	589045 b3edfbec9066e76693ec9b1443d86cda62bafe1f	no	63
Warnings:					
Information:					

21	Foreign Reference	WO15095690.pdf	435656 b12e0d25fbe1b4168df148d48479248ceb2fcf6a	no	47
Warnings:					
Information:					
22	Foreign Reference	WO15095693.pdf	459835 9702a99746dfa9bec7cad8a9c650dcdb69bc6022	no	51
Warnings:					
Information:					
23	Foreign Reference	WO15095694.pdf	765832 74180a63133fca6c8ee87222bcaaac7ef592358c	no	55
Warnings:					
Information:					
24	Foreign Reference	WO15095696.pdf	513072 c68867461c18c992b98298348abeaccbce0bb8b	no	54
Warnings:					
Information:					
25	Non Patent Literature	WO2006046943_Comm_dated_Oct_31_2007.pdf	43703 40d958a991f6b96a25c430d6dfad2104c0df39fd	no	1
Warnings:					
Information:					
26	Non Patent Literature	Mercer_2011.pdf	157765 182eb477871266d40454b380a5e1c3f689897db1	no	9
Warnings:					
Information:					
27	Information Disclosure Statement (IDS) Form (SB08)	20161206_IDS4_28612-US-NP_EF.pdf	166112 cbdc19096c910ed63d3615f15b281105ae9f205c	no	9
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					

28	Foreign Reference	WO03092628_EF.pdf	10569126 d61c54d43da0546867dfae60702afd9f3cfb bd6b	no	18
Warnings:					
Information:					
29	Fee Worksheet (SB06)	fee-info.pdf	30683 de04654f03776073d5715c44b8a3a099b01 f1a3d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	50062636		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT COOPERATION TREATY

SAC/GJC

From the INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

RECEIVED
NOV 06 2007
SHERIDAN ROSS PC

PCT

COMMUNICATION IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE

Applicant's or agent's file reference 2997-45-1-P	Date of mailing (*day/month/year*) 31 OCT 2007 REPLY DUE See paragraph 1 below
International application No. PCT/US04/34965	International filing date (*day/month/year*) 22 October 2004 (22.10.2004)
Applicant MARTEK BIOSCIENCES CORPORATION	

1. ☐ REPLY DUE within _____ months/days from the above date of mailing

   ☒ NO REPLY DUE

2. COMMUNICATION:
The International Search Report and Written Opinion mailed on 26 September 2007 contains various errors including lack of indication for Box 6 of the cover sheet of the Search Report, the incorrect indication of a Y reference in box C of the Search Report, missing box IV of the Written Opinion and incorrect indication on Box V of the Written Opinion. A corrected copy is hereby attached. The response period for the International Search Report has been reset from the above Mailing Date.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Shian T. Luong Telephone No. 571-272-3700

Form PCT/ISA/224 (January 1994; reprint January 2004)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 01/30/2017

DSM Services USA
6480 Dobbin Road
Columbia, MD 21045

EXAMINER
CARR, DEBORAH D

ART UNIT	PAPER NUMBER
1672	

NOTIFICATION DATE	DELIVERY MODE
01/30/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

dsmna.ip@dsm.com

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 13/151,014	Applicant(s) CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1672	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *21 October 2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1 -4,6,8,31 -33,39,41,44-47,49,50,52-58 and 63-78* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1 -4,6,8,31 -33,39,41,44-47,49,50,52-58 and 63-78* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *12/16*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Arguments

2. Applicant's arguments, see pages 7-12, filed 21 October 2016, with respect to the rejection(s) of claim(s) 1, 31, 33, 63 under 35USC§102(b) and claim(s) 52-57 under 35USC§103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection under 35 USC§102(b) and 35USC§103(a) is made in view of different interpretation of the previously applied reference.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim(s) 1, 4, 6, 8, 31- 33, 63-78 is/are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by Kobzeff et al. (US Pub. 2006/0099693).

US Pub'693 teaches a method for liberating a lipid from a biomass comprising liberating the lipid at a temperature of about 10°C to about 80°C at a pH level of from about pH 5 to about pH 9. This method is conducted in the substantial absence of an extraction solvent. If the lipid from the above step is in the form of an emulsion, this product can be used "as is" or dried and used or treated to release the lipid from the emulsion (See: sect. [0012], sect. [0014], sect. [0020]-[0021], sect. [0024], sect. [0027-0029], sect. [0031], sect. [0036] - [0037]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 52, 54-57 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Dueppen (US Pub. 2005/0115897).

As to Claim 52, US Pub'897 discloses an extracted microbial lipid (abstract: para (0011)) comprising a triglyceride fraction of at least 70% by weight (para [0035]). US Pub'897 discloses therein the triglyceride fraction comprises docosahexaenoic acid (para [0011]). US Pub'897 discloses wherein the docosapentaenoic acid n-6 content of the triglyceride fraction (para [0010], (0011]) is from at least 0.5% by weight to 6% by weight (para [0056]), and wherein the oil has an anisidine value of 26 or less (para [0067], Table 5).

US Pub'897 does not specifically disclose wherein the DHA content is at least 50% by weight. However, US Pub'897 teaches wherein the lipid are preferably at least 85% triglyceride (para [00351]) and wherein 'preferred attributes of the process include the selective recovery of only LCPUFA-containing triglycerides at the expense of trisaturated glycerides' (para [0038]). It would have been obvious to a person skilled in to obtain a DHA content of at least 50 wt. % from a DHA-producing microbe, based upon the teaching of US Pub'897.

As to Claim 54, US Pub'897 discloses an extracted microbial lipid (abstract; para [0011]) comprising a triglyceride fraction of at least 70% by weight (para [0035]). US Pub'897 discloses wherein the docosahexaenoic acid content of the triglyceride fraction (para [0011]) and wherein

the oil has an anisidine value of 26 or less (para [0067], Table 5). US Pub'897 does not disclose an embodiment where DHA content is at least 60% by weight. However, US Pub'897 teaches wherein the lipid are preferably at least 85% triglyceride (para (0035]), and wherein ' preferred attributes of the process include the selective recovery of only LCPUFA-containing triglycerides at the expense of trisaturated glycerides• (para (0038]). It would have been obvious to a person skilled in to obtain a DHA content of at least 60 wt% from a DHA· producing microbe based upon the teaching of US Pub'897.

As to Claim 55, US Pub'897 discloses wherein the oil has a peroxide value of 5 or less (para [0064], Table 2).

Applicant argue that US'897 does not disclose a lipid composition comprising the required PUFA concentration and the preparation disclosed would not result in a lipid composition containing less than 5% organic solvent.

As disclosed in para [0023] the desired lipid composition is comprised of LCPUFA in the form that exist in the lipid, most typically triglyceride. The undesirable components are the trisaturated glycerides such as lauric acid, myristic acid, and palmitic acid. The solvent used in the process are those in which the trisaturated glycerides are insoluble and are selectively crystallized out followed by centrifugation. (See para [0027]).

Applicant refers to para [0054] wherein it's stated that the solid fraction contains very little DHA and DPA. The solid fraction should contain very little DHA and DPA since the solvent used was one in which both PUFA was soluble and the only components (trisaturated glycerides) should have remained solid in the solution and in the left after filtering. The lipid composition which as applicant has stated on page 3 on the response is the inventive concept of US Pub'897 constants higher levels of DHA and DPA.

As to the organic solvent content, applicant argues that more than 5% is present since the lipid fraction is rinsed with acetone. It is stated in para [0060] the lipid/acetone fraction is placed in a rotary evaporator which means the acetone is evaporated off leaving the orange colored liquid.

7. Claim 53 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Dueppen (US Pub. 2005/0115897) in view of Metz et al (US Pub. 2008/0148433).

As to Claim 53, US Pub'897 discloses an extracted microbial lipid (abstract; para [0011]) comprising a triglyceride fraction of at least 70% by weight (para [0035]). US Pub'897 discloses wherein the triglyceride fraction comprises docosahexaenoic acid (para [0011]). US Pub'897 discloses wherein the docosapentaenoic acid n-6 content of the triglyceride fraction (para [0010], [0011]) is from at least 0.5% by weight to 6% by weight (para [0056]), and wherein the oil has an anisidine value of 26 or less (para [0067], Table 5). US Pub'897 discloses a ratio of DHA to DPA of about 3:1 (para [0040]), but does not explicitly disclose wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1.

Metz teaches plants engineered to produce at least two target PUFAs (e.g., DHA and DPAn-6) at desired ratios ('In one aspect. the plant produces DHA and DPAn-6 (the products of a PUFA PKS system described herein). and the ratio of DHA to DPAn-6 is from about 1:10 to about 10:1, including any ratio in between. In a one embodiment, the ratio of DHA to DPA is from about 1:1 to about 3:1, and in another embodiment, about 2.5:1 "; para [0220]).

It would have been obvious to a person skilled in the art to use the specific PUFA-producing processes of Metz to adjust the DHA produced in a microbe as taught by US Pub'897 in order to achieve a DHA:DPA ratio of 6:1 or greater, In order to produce a specifically DHA-rich product.

Applicant argue that US'897 does not disclose a lipid composition comprising the required PUFA concentration and the preparation disclosed would not result in a lipid composition containing less than 5% organic solvent.

As disclosed in para [0023] the desired lipid composition is comprised of LCPUFA in the form that exist in the lipid, most typically triglyceride. The undesirable components are the trisaturated glycerides such as lauric acid, myristic acid, and palmitic acid. The solvent used in the process are those in which the trisaturated glycerides are insoluble and are selectively crystallized out followed by centrifugation. (See para [0027]).

Applicant refers to para [0054] wherein it's stated that the solid fraction contains very little DHA and DPA. The solid fraction should contain very little DHA and DPA since the solvent used was one in which both PUFA was soluble and the only components (trisaturated glycerides) should have remained solid in the solution and in the left after filtering. The lipid composition which as applicant has stated on page 3 on the response is the inventive concept of US Pub'897 constants higher levels of DHA and DPA.

As to the organic solvent content, applicant argues that more than 5% is present since the lipid fraction is rinsed with acetone. It is stated in para [0060] the lipid/acetone fraction is placed in a rotary evaporator which means the acetone is evaporated off leaving the orange colored liquid.

8. Claims 39, 41, 44-47, 49-50 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Fichtali et al.

Claim(s) 39, 41, 44-47, 49-50 is/are product-by-process claims. M.P.E.P. § 2113 reads, "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps."

"Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

The use of 35 U.S.C. §§ 102 and 103 rejections for product-by-process claims has been approved by the courts. "[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

US Pub'791 relates to a polyunsaturated fatty acid-containing oil product and uses thereof, such as in a solid fat composition that includes a microbially-derived long chain polyunsaturated fatty acid. The claims differs in that an aroma level is given for the oil.

However it would have been obvious to one of ordinary skill in the art to extrapolate based on the data given in the examples, to deem that the oil exhibited no overall aroma intensity. The range given for the overall aroma intensity of 3 or less reads on zero. Therefore one could day that the oil product reads on the instant invention of the claims listed supra.

Claim Rejections - 35 USC § 112

9. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 3 rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Applicant has amended claim 1 read state that the pH is raised to 8 or above. Claims 7 states that a second base is added to raise the pH to 7 or above. It is unclear how the second base can raise the pH to 7 or above when the pH is already 8 or above.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBORAH D. CARR whose telephone number is (571)272-0637. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fereydoun Sajjadi can be reached on 571-272-3311. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEBORAH D CARR/
Primary Examiner
Art Unit 1672

Ddc

Notice of References Cited	Application/Control No. 13/151,014	Applicant(s)/Patent Under Reexamination CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1672	Page 1 of 1

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*	B	US-2005/0115897 A1	06-2005	Dueppen, Daniel G	C11B1/00	210/634
*	C	US-2008/0148433 A1	06-2008	Metz; James G.	C07K14/21	800/281
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	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

CPC- SEARCHED		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017	DDC
C11B3/02	9/2015, 1/2016, 7/2016	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017	DDC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017	ddc

SEARCH NOTES		
Search Notes	Date	Examiner
see transcript	8/2014	ddc
updated search	1/2015	ddc
updated search	9/2015	ddc
updated search	1/2016	ddc
updated search	7/2016	ddc
updated search	1/2017	ddc

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
435	134	8/2014	ddc
554	8, 223, 224, 227	8/2014	ddc
see areas searched		9/2015, 1/2016	ddc

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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	DEBORAH D CARR	1672

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	Attorney Docket Number	28612-US-NP

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	3	WO20010076385	WO		2001-10-18	WEST-FALIA SEPARATOR INDUSTRY GMBH		☐
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	7	WO2006128244	WO	A1	2006-12-07	McFarlane Marketing Pty Ltd		☐
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	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

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	16	WO2012078852	WO	A2	2012-06-14	SRS Energy		☐
	17	WO2012109642	WO	A1	2012-08-16	Physcal Inc		☐
	18	WO2013040732	WO	A1	2013-03-28	Xiamen Huison Biotech Co. Ltd.		☐
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	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

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	21	WO2015095462	WO	A1	2015-06-25	BP Biofuels UK Limited		☐
	22	WO2015095688	WO	A1	2015-06-25	DSM IP Assets B.V.		☐
	23	WO2015095690	WO	A2	2015-06-25	DSM IP Assets B.V.		☐
	24	WO2015095693	WO	A2	2015-06-25	DSM IP Assets B.V.		☐
	25	WO2015095694	WO	A1	2015-06-25	DSM IP Assets B.V.		☐
	26	WO2015095696	WO	A1	2015-06-25	DSM IP Assets B.V.		☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	BALDAUF, S.M., BOOK, Am. Nat., 1999, 154, S178	☐
	2	MERCER, PAULA ET AL., Developments in oil extraction from microalgae, Eur. J. Lipid Sci. Technol., 2011, 1-9	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	3	WIPO, WO2006046943 Communication in which no other form available, dated October 31 2007, 2007	☐

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EXAMINER SIGNATURE

Examiner Signature	/DEBORAH D CARR/	Date Considered	01/19/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2016-12-06
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 4148
Cherinko et al.	Art Unit: 1672
Appl. No.: 13/151,014	Examiner: CARR, DEBORAH D.
Filed: June 1, 2011	Atty. Docket: 28612-US-NP

For: **EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM**

Reply and Amendment

Mail Stop Amendment

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the non-final Office Action dated January 30, 2017, Applicants submit the following amendments and remarks.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A process for obtaining a lipid from a cell composition, comprising:
(a) lysing a cell of said cell composition to form a lysed cell composition;
(b) demulsifying said lysed cell composition to form a demulsified cell composition, wherein the demulsifying comprises contacting said lysed cell composition with a first base to raise the pH of the lysed cell composition to 8 and contacting the lysed cell composition with a second base to raise the pH of the lysed cell composition to 7 or above to demulsify the cell composition;
(c) separating said lipid from the demulsified cell composition; and
(d) harvesting said lipid;
wherein (b) comprises heating said lysed cell composition to a temperature of at least 70° C.

2. (Cancelled)

3. (Cancelled)

4. (Previously Presented) The process of claim 1, wherein (b) comprises contacting said lysed cell composition with a salt to demulsify the cell composition.

5. (Cancelled)

6. (Previously Presented) The process of claim 4, wherein the salt is added in an amount of 0.1% to 20% by weight of the lysed cell composition.

7. (Cancelled).

8. (Previously Presented) The process of claim 4, wherein the salt is selected from: alkali metal salts, alkali earth metal salts, sulfate salts, and combinations thereof.

9-30. (Cancelled)

31. (Previously Presented) The process of claim 1, comprising washing the cell or cell composition prior to (a).

32. (Previously Presented) The process of claim 1, comprising pasteurizing the cell or cell composition prior to (a).

33. (Previously Presented) The process of claim 1, comprising concentrating the lysed cell composition prior to (a).

34-38. (Cancelled)

39. (Currently Amended) A lipid obtained by the process of claim 1, the lipid comprising at least 35 % by weight docosahexaenoic acid, at least 20% by weight eicosapentaenoic acid and less than 5% by weight each of arachidonic acid, docosapentaenoic acid n-6, oleic acid, linoleic acid, linolenic acid, eicosenoic acid, erucic acid, and stearidonic acid ~~wherein the lipid has an overall aroma intensity of 3 or less~~.

40. (Cancelled)

41. (Cancelled)

42. (Cancelled)

43. (Cancelled)

44. (Previously Presented) The lipid of claim 39, wherein the lipid has an anisidine value of 26 or less.

45. (Previously Presented) The lipid of claim 39, wherein the lipid has a phosphorus content of 100 ppm or less.

46. (Previously Presented) The lipid of claim 39, wherein the lipid has a peroxide value of 5 or less.

47. (Cancelled)

48. (Cancelled)

49. (Currently Amended) The lipid of claim ~~47~~39, wherein the lipid has a peroxide value of 5 or less.

50. (Previously Presented) The lipid of claim 39, wherein the lipid is a crude oil.

51. (Cancelled)

52. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

53. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

54. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weigh of an organic solvent.

55. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a peroxide value of 5 or less.

56. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a phosphorus content of 100 ppm or less.

57. (Previously Presented) The extracted microbial lipid of claim 52, wherein the lipid is a crude oil.

58. (Previously Presented) A process for obtaining a lipid, the process comprising refining a crude lipid of claim 50.

59-62. (Cancelled)

63. (Previously Presented) The process of claim 1, wherein (b) comprises heating said lysed cell composition to a temperature of from 70° C to 100° C.

64. (Previously Presented) The process of claim 1, wherein (b) comprises agitating the lysed cell composition to demulsify the cell composition.

65. (Previously Presented) The process of claim 1, wherein (a) comprises adding a salt to said cell composition to demulsify the cell composition.

66. (Previously Presented) The process of claim 1, wherein (a) comprises raising the pH of said cell composition to 8 or above to demulsify or lyse the cell composition.

67. (Previously Presented) The process of claim 1, wherein the lysed cell composition is in the form of an oil-in-water emulsion comprising a mixture of a continuous aqueous phase and a dispersed lipid phase.

68. (Previously Presented) The process of claim 1, wherein (c) comprises centrifuging the demulsified cell composition.

69. (Previously Presented) The process of claim 1, wherein the lipid is a crude lipid.

70. (Previously Presented) The process of claim 69, further comprising (e) refining said crude lipid to obtain a refined lipid.

71. (Previously Presented) The process of claim 1, wherein said lipid has an anisidine value of 26 or less.

72. (Previously Presented) The process of claim 1, wherein said lipid has a peroxide value of 5 or less.

73. (Previously Presented) The process of claim 1, wherein said cell is a microbial cell.

74. (Previously Presented) The process of claim 73, wherein said microbial cell is of the genus *Thraustochytrium*, *Schizochytrium*, or mixtures thereof.

75. (Previously Presented) The process of claim 1, wherein said lipid comprises omega 3 and/or omega-6 polyunsaturated fatty acids.

76. (Previously Presented) The process of claim 1, wherein said lipid comprises at least one of DHA, DPA(n-3), DPA(n-6), EPA, and ARA.

77. (Previously Presented) The process of claim 1, wherein an organic solvent is not added to said cell composition, said lysed cell composition, or said lipid in an amount or concentration sufficient to extract said lipid from said cell.

78. (Previously Presented) The process of claim 1, wherein the lipid contains less than 5% by weight of an organic solvent.

Remarks

After entry of the above amendments, the claims pending in the subject application are 1, 4, 6, 8, 31-33, 39, 44-46, 49, 50, 52-58 and 63-78. Claims 3, 41 and 47 have been cancelled. Claims 1, 39 and 49 have been amended. No new matter has been added by these amendments.

Reconsideration of this application based on the Amendments and Remarks presented herein is respectfully requested.

Rejections under 35 U.S.C. §102(b)

Claims 1, 4, 6, 8, 31-33, 63-78 have been rejected under 35 U.S.C. §102 as being anticipated by U.S. Publication No. 2006/0099693 to Kobzeff et al. ("Kobzeff").

Claim 1 has been amended to include dependent claim 3, which was not included in this rejection. Specifically, claim 1 has been amended to include in (b), wherein the demulsifying comprises contacting said lysed cell composition with a first base to raise the pH of the lysed cell composition to 8 or above. Kobzeff does not include raising the pH of the lysed cell composition to 8 or above to demulsify the cell composition.

Applicants submit that independent claim 1 and dependent claims therefrom are not anticipated by Kobzeff and request that this rejection be withdrawn.

Rejections under 35 U.S.C. §103(a)

A. Claims 52 and 54-57 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 2005/0115897 to Dueppen et al. ("Dueppen").

Claim 52 is directed to an extracted microbial lipid comprising a triglyceride (TG) fraction of at least 70% by weight, wherein the docosahexaenoic acid (DHA) content of the TG fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 (DPA n-6) content of the TG fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% organic solvent.

Applicants reiterate its arguments from the previous office action. One of ordinary skill in the art would not look to Dueppen for preparation of a composition comprising a triglyceride fraction wherein the DHA is at least 50% by weight and the DPA n-6 is from at least 0.5-6% and having less than 5% organic solvent. In example 1, a sample of unwinterized DHA-rich liquid was pulled from frozen storage. It was subjected to "acetone winterization" (*see*, [0054])

in which a portion of the sample was put in a flask and cold acetone was added. The sample was filtered, and the solid fraction washed with cold acetone and dried. The "lipid/acetone" fraction resulting from the filtration was concentrated to produce an orange-colored liquid. Both the solid fraction and the lipid/acetone fraction were analyzed by FAME for their fatty acid profile. FAME analysis measures fatty acid profile and does not analyze lipid class profile, which would show the quantitative value of the lipid composition (including triglycerides). As disclosed in [0056], the solid fraction had very little DHA (2.4%) and DPA n-6 (0.9%). In contrast to Dueppen, the present invention comprises a triglyceride fraction wherein the DHA is at least 50% by weight and the DPA n-6 is from at least 0.5-6%.

Dueppen relates to production of a lipid composition. The solid fraction in Dueppen, although containing minor amounts of lipids, is not the lipid composition which is the targeted inventive concept of Dueppen. In fact, Dueppen explicitly refers to the portions of the sample in Example 1 after winterization as a "solid fraction" and not as the "lipid/acetone fraction". The sample cited by the Examiner for the amount of DPA n-6 is not the lipid-containing fraction of Dueppen. The amount of DHA and DPA n-6 contained in the sample in Dueppen is 2.4% and 0.9%, respectively. One of skill in the art would not look to Dueppen to produce a lipid composition having at least 50% DHA and from at least 0.5-6% DPA n-6, as the solid fraction containing 2.4% DHA and 0.9% DPA n-6 is not the lipid composition. Even if one of ordinary skill in the art would look to the non-lipid-containing fraction (which position Applicates do not support), the DHA amount found in the solid fraction is at least 20 times greater in the present application than that in Dueppen. The amount of DHA and DPA n-6 in the lipid/acetone fraction is 41% and 16%, respectively. One of ordinary skill in the art would not look to Dueppen, particularly the lipid/acetone fraction, as the amount of DPA n-6 is much greater than that of the present invention.

Further, Dueppen is a process for purifying a lipid composition having predominantly neutral lipid components wherein the process employs contacting the lipid composition with a polar solvent. Example 1 explicitly discloses use of a polar solvent (acetone) for purification of a lipid composition. From the use of acetone, which is an organic solvent, one of skill in the art would not look to Dueppen for a composition having less than 5% organic solvent.

Applicants therefore respectfully submit that as the solid fraction the Examiner cites in his rejection to show the DPA n-6 levels is not a lipid composition and as Dueppen discloses production of a lipid composition, in which the lipid-acetone fraction shows significantly higher levels of DPA n-6 than in the present application, and also discloses use of a polar

solvent for purification of the lipid-containing fraction, Dueppen actually teaches away from the present invention and one of skill in the art would not look to Dueppen to produce a composition wherein the DHA is at least 50% by weight and the DPA n-6 is from at least 0.5-6% and has less than 5% organic solvent.

Claim 54 is directed to an extracted microbial lipid comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weigh of an organic solvent.

One of ordinary skill in the art would not look to Dueppen for preparation of a composition comprising a triglyceride fraction wherein the DHA is at least 60% by weight and has less than 5% organic solvent. In example 1, a sample of unwinterized DHA-rich liquid was pulled from frozen storage. It was subjected to "acetone winterization" (*see*, [0054]) in which a portion of the sample was put in a flask and cold acetone was added. The sample was filtered, and the solid fraction washed with cold acetone and dried. The "lipid/acetone" fraction resulting from the filtration was concentrated to produce an orange-colored liquid.

Dueppen is a process for purifying a lipid composition having predominantly neutral lipid components wherein the process employs contacting the lipid composition with a polar solvent. Example 1 explicitly discloses use of a polar solvent (acetone) for purification of a lipid composition.

Applicants therefore respectfully submit that as Dueppen discloses use of a polar solvent for purification of the lipid-containing fraction, Dueppen actually teaches away from the present invention and one of skill in the art would not look to Dueppen to produce a composition wherein the DHA is at least 60% by weight and has less than 5% organic solvent.

Applicants submit that independent claims 52 and 54 and dependent claims therefrom are not unpatentable over Dueppen and request that this rejection be withdrawn.

B. Claim 53 is rejected under 35 U.S.C. §103(a) as being unpatentable over Dueppen in view of U.S. Publication No. 2008/0148433 ("Metz").

Claim 53 is directed to an extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil has an anisidine value

of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

As discussed in the arguments above, one of ordinary skill in the art would not look to Dueppen to produce a composition having at least 50% DHA and from at least 0.5-6% DPA n-6 and having less than 5% of an organic solvent. Metz is cited for disclosure of the ratio of DHA and DPA n-6. Metz does not cure the deficiencies of Dueppen.

Applicants submit that independent claim 53 is not unpatentable over Dueppen in view of Metz and request that this rejection be withdrawn.

C. Claims 39, 41, 44-47 and 49-50 are rejected under 35 U.S.C. §103(a)) as being unpatentable over U.S. Publication No. 2008/0107791 to Fichtali et al. ("Fichtali").

The Examiner states claims 39, 41, 44-47 and 49-50 are product-by-process claims and that MPEP §2113 reads, "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps." Further, the Examiner states Fichtali relates to a polyunsaturated fatty acid-containing product and uses thereof, such as in a solid fat composition that includes a microbially-derived long chain polyunsaturated fatty acid and the claims differ in that an aroma oil is given for the oil but that it would be obvious to one of skill in the art to extrapolate based on the data given in the examples to deem that the oil exhibited no odor.

As amended, claim 39 is directed to a lipid obtained by the process of claim 1, the lipid comprising at least 35% by weight docosahexaenoic acid, at least 20% by weight eicosapentaenoic acid and less than 5% by weight each of arachidonic acid, docosapentaenoic acid n-6, oleic acid, linoleic acid, linolenic acid, eicosenoic acid, erucic acid, and stearidonic acid.

Fichtali does not teach or suggest a lipid comprising at least 35% by weight docosahexaenoic acid, at least 20% by weight eicosapentaenoic acid and less than 5% by weight each of arachidonic acid, docosapentaenoic acid n-6, oleic acid, linoleic acid, linolenic acid, eicosenoic acid, erucic acid, and stearidonic acid. Instead, in Example 1, Fichtali teaches use of a DHA-rich *Schizochytrium* microorganism to produce an oil containing DHA. This oil is used in the following examples in Fichtali and nowhere is it disclosed that such oil also has, in particular, an eicosapentaenoic acid contact of at least 20% by weight, or less than 5% by weight each of arachidonic acid, docosapentaenoic acid n-6, oleic acid, linoleic acid, linolenic acid, eicosenoic acid, erucic acid, and stearidonic acid

Applicants submit that independent claim 39 and claims dependent therefrom are not

unpatentable over Fichtali and request that this rejection be withdrawn.

Rejections under 35 U.S.C. §112(b)

Claim 3 is rejected under 35 U.S.C. §112(b), second paragraph for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

Claim 3 has been cancelled, rendering this rejection moot.

Conclusion

Prompt and favorable consideration of this Reply and Amendment is respectfully requested. Applicants believe the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided. The Commissioner is hereby authorized to charge any deficiency in fees or credit any over payment to deposit account No. 50-5958, referencing attorney docket No. 28612-US-NP.

Respectfully submitted,

/Shannon McGarrah/

Shannon McGarrah
Attorney for Applicants
Registration No. 55,442

DSM North America, Inc.
6480 Dobbin Road
Columbia, Maryland 21045
443-542-2395

Date: July 31, 2017

PTO/AIA/22 (03-13)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 28612-US-NP
Application Number 13/151014	Filed June 1, 2011
For EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM	
Art Unit 1672	Examiner CARR, DEBORAH D.

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☐	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☑	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$ 1400
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 505958.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 55442.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Shannon McGarrah/ — Signature

July 31, 2017 — Date

Shannon McGarrah — Typed or printed name

443-542-2395 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal					
Application Number:	13151014				
Filing Date:	01-Jun-2011				
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom				
First Named Inventor/Applicant Name:	Stephen Robert Cherinko				
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray				
Attorney Docket Number:	28612-US-NP				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					
Extension-of-Time:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1400	1400
Miscellaneous:				
			Total in USD ($)	**1400**

Electronic Acknowledgement Receipt	
EFS ID:	29929063
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	31-JUL-2017
Filing Date:	01-JUN-2011
Time Stamp:	08:50:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1400
RAM confirmation Number	073117INTEFSW00012702505958
Deposit Account	505958
Authorized User	Kimberly Sauter-Bray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	20170731_4thOAReply_28612-US-NP.pdf	138405 0c41175b3c7bf760b2064aa335ce3857019cd2bd	no	11
Warnings:					
Information:					
2	Extension of Time	20170731_3MthEOT_28612-US-NP.pdf	159901 40e506788fdcf84ca91563d126a69b12b5b8edea	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30786 bd42f54aeba94eade445a8279cd7275c15cf95cd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	329092		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/151,014	Filing Date 06/01/2011	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	07/31/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 36	Minus	** 39	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/MARSHA RICHARDS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 10/19/2017

DSM North America Inc.
6480 Dobbin Road
Columbia, MD 21045

EXAMINER
CARR, DEBORAH D

ART UNIT	PAPER NUMBER
1671	

NOTIFICATION DATE	DELIVERY MODE
10/19/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

dsmna.ip@dsm.com

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 13/151,014	Applicant(s) CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1671	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2017*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,4,6,8,31-33,39,44-46,49,50,52-58 and 63-78* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *52-58* is/are allowed.

7)☒ Claim(s) *1,4,6,8,31-33,39,44-46,49,50 and 63-78* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Arguments

2. Applicant's arguments, see pages 7-11, filed 31 July, with respect to the rejection(s) of claim(s) 1, 4, 6, 8, 31- 33, 63-78 under 35USC§102(b), claim(s) 39, 44-46, 49-50, 52-58 under 35USC§103(a), and claim 3 under 35 USC§112, 2nd paragraph have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a newly amended claim 1 is being rejected under 35 USC§112, 2nd paragraph.

Claim Rejections - 35 USC § 112

3. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 1 rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Applicant has amended claim 1 read "and contacting the lysed cell composition with a second base to raise the pH of the lysed cell composition to 7 or above to demulsify the cell composition". It is unclear how the second base can raise the pH to 7 or above when the pH is already 8 or above.

Allowable Subject Matter

5. Claims 52-58 allowed.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBORAH D. CARR whose telephone number is (571)272-0637. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fereydoun Sajjadi can be reached on 571-272-3311. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system,

contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEBORAH D CARR/
Primary Examiner
Art Unit 1671

Ddc

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1671

CPC- SEARCHED		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017	DDC
C11B3/02	9/2015, 1/2016, 7/2016	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017	DDC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017	ddc

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
see transcript	8/2014	ddc
updated search	1/2015	ddc
updated search	9/2015	ddc
updated search	1/2016	ddc

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
updated search	7/2016	ddc
updated search	1/2017	ddc

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
435	134	8/2014	ddc
554	8, 223, 224, 227	8/2014	ddc
see areas searched		9/2015, 1/2016	ddc

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	
	1	÷	=	=	=	=	✓	✓	✓	
	2	÷	=	=	=	=	✓	-	-	
	3	÷	=	=	=	=	✓	✓	-	
	4	÷	=	=	=	=	✓	✓	✓	
	5	÷	-	-	-	-	-	-	-	
	6	÷	=	=	=	=	✓	✓	✓	
	7	÷	-	-	-	-	-	-	-	
	8	÷	=	=	=	=	✓	✓	✓	
	9	÷	-	-	-	-	-	-	-	
	10	÷	-	-	-	-	-	-	-	
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	32	÷	=	=	=	=	✓	✓	✓	
	33	÷	=	-	=	=	✓	✓	✓	
	34	÷	-	-	-	-	-	-	-	
	35	÷	-	-	-	-	-	-	-	
	36	÷	-	-	-	-	-	-	-	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	
	37	÷	-	-	-	-	-	-	-	
	38	÷	-	-	-	-	-	-	-	
	39	÷	=	✓	=	=	✓	✓	✓	
	40	÷	-	-	-	-	-	✓	-	
	41	÷	=	✓	=	=	✓	✓	-	
	42	÷	=	✓	-	-	-	-	-	
	43	÷	-	-	-	-	-	-	-	
	44	÷	=	✓	=	=	✓	✓	✓	
	45	÷	=	✓	=	=	✓	✓	✓	
	46	÷	=	✓	=	=	✓	✓	✓	
	47	÷	=	✓	=	=	✓	✓	-	
	48	÷	-	-	-	-	-	-	-	
	49	÷	=	✓	=	=	✓	✓	✓	
	50	÷	=	✓	=	=	✓	✓	✓	
	51	÷	=	✓	-	-	-	-	-	
	52	÷	=	✓	=	=	✓	✓	=	
	53	÷	=	✓	=	=	✓	✓	=	
	54	÷	=	✓	=	=	✓	✓	=	
	55	÷	=	✓	=	=	✓	✓	=	
	56	÷	=	✓	=	=	✓	✓	=	
	57	÷	=	✓	=	=	✓	✓	=	
	58	÷	=	✓	=	=	✓	✓	=	
	59	÷	-	-	-	-	-	-	-	
	60	÷	-	-	-	-	-	-	-	
	61	÷	-	-	-	-	-	-	-	
	62	÷	-	-	-	-	-	-	-	
	63	÷	=	=	=	=	✓	✓	✓	
	64		=	=	=	=	✓	✓	✓	
	65		=	=	=	=	✓	✓	✓	
	66		=	=	=	=	✓	✓	✓	
	67		=	=	=	=	✓	✓	✓	
	68		=	=	=	=	✓	✓	✓	
	69		=	=	=	=	✓	✓	✓	
	70		=	=	=	=	✓	✓	✓	
	71		=	=	=	=	✓	✓	✓	
	72		=	=	=	=	✓	✓	✓	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	
	73		=	=	=	=	✓	✓	✓	
	74		=	=	=	=	✓	✓	✓	
	75		=	=	=	=	✓	✓	✓	
	76		=	=	=	=	✓	✓	✓	
	77		=	=	=	=	✓	✓	✓	
	78		=	=	=	=	✓	✓	✓	

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13151014	Filing Date	2011-06-01	Docket Number (if applicable)	28612-US-NP	Art Unit	1671
First Named Inventor	Cherinko, Stephen Robert			Examiner Name	CARR, DEBORAH D.		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the orde in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 505958

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

EFS - Web 2.1.15

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-01-18
Name	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is t file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Tim will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions fc reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the informatio solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of th application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal					
Application Number:	13151014				
Filing Date:	01-Jun-2011				
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom				
First Named Inventor/Applicant Name:	Stephen Robert Cherinko				
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray				
Attorney Docket Number:	28612-US-NP				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					
Extension-of-Time:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt	
EFS ID:	31537997
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	18-JAN-2018
Filing Date:	01-JUN-2011
Time Stamp:	14:41:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1900
RAM confirmation Number	011918INTEFSW00001844505958
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment Submitted/Entered with Filing of CPA/RCE	20180118_5thFRReply_28612-US-NP_EF.pdf	75286 5cca28e7e4f67d2edc87a92b109365a29b0956a9	no	3
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	20180118_RCE_28612-US-NP_EF.pdf	1858377 d70b4acc32af42997d28f98a243f95b9b7b34712	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30933 ace7e1afb8688b9ed5f23292c90bd62f1ba79252	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1964596		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 4148
CHERINKO et al.	Art Unit: 1671
Appl. No.: 13/151,014	Examiner: CARR, DEBORAH D.
Filing Date: June 1, 2011	Atty. Docket: 28612-US-NP

For: **EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM**

Commissioner for Patents - OPAP
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION

Dear Commissioner:

This paper is filed in response to the Final Office Action dated October 19, 2017. Entry and consideration of the following amendments and remarks are respectfully requested.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Remarks/Arguments begin on page 3.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-51. (Cancelled)

52. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

53. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent.

54. (Previously Presented) An extracted microbial lipid comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weigh of an organic solvent.

55. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a peroxide value of 5 or less.

56. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a phosphorus content of 100 ppm or less.

57. (Previously Presented) The extracted microbial lipid of claim 52, wherein the lipid is a crude oil.

58. (Previously Presented) A process for obtaining a lipid, the process comprising refining a crude lipid of claim 50.

59-78. (Cancelled)

REMARKS/ARGUMENTS

Claims 1, 4, 6, 8, 31-33, 39, 44-46, 49, 50, 52-58 and 63-78 are pending. Claims 52-58 are allowed. Claims 1,4,6, 8, 31-33, 39, 44-46, 49, 50 and 63-78 are rejected and have been cancelled.

Reconsideration of this application based on the Amendments and Remarks presented herein is respectfully requested.

Rejection under 35 U.S.C. § 112, 2nd paragraph

Claim 1 is rejected under 35 U.S.C. § 112 2nd paragraph for failing to point out and distinctly claim the subject matter which Applicants regard as the invention.

Claim 1 has been cancelled, thereby rendering this rejection moot.

Accordingly, Applicants respectfully request the Office withdraw this rejection.

Conclusion

Having fully responded to the pending Office Action, Applicants submit that the claims are in condition for allowance and earnestly solicit an early Notice to that effect. The Examiner is invited to contact the undersigned to resolve any issues. If any fees or extensions are required, Applicant petitions for an extension of time and authorizes the payment of any fees (or any deficiency therein) to be charged to Deposit Account No. 50-5958, referencing Attorney Docket No. 28612-US-NP.

Respectfully submitted,

DSM North America, Inc.

By: /Shannon McGarrah/
Shannon McGarrah
Attorney for Applicant
Reg. No. 55,442

Date: January 18, 2018
DSM North America, Inc.
6480 Dobbin Road
Columbia, MD 21045
Telephone: 443-543-2395

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

109143 7590 02/23/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	PAPER NUMBER
1671	

DATE MAILED: 02/23/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: Extraction of Lipid From Cells and Products Therefrom

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$0	$1000	05/23/2018

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

109143 7590 02/23/2018
DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: Extraction of Lipid From Cells and Products Therefrom

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$0	$1000	05/23/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
CARR, DEBORAH D	1671	554-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 02/23/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	PAPER NUMBER
1671	

DATE MAILED: 02/23/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/151,014	Applicant(s) CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1671	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed 18 January 2018*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *52-58*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DEBORAH D CARR/
Primary Examiner
Art Unit: 1671

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1671

CPC- SEARCHED		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018	DDC
C11B3/02	9/2015, 1/2016, 7/2016	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018	DDC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018	ddc

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
see transcript	8/2014	ddc
updated search	1/2015	ddc
updated search	9/2015	ddc

	/DEBORAH D CARR/ Primary Examiner.Art Unit 1671

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
updated search	1/2016	ddc
updated search	7/2016	ddc
updated search	1/2017	ddc
updates search	2/2018	ddc

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
435	134	8/2014, 2/2018	ddc
554	8, 223, 224, 227	8/2014, 2/2018	ddc
see areas searched		9/2015, 1/2016, 2/2018	ddc

	/DEBORAH D CARR/ Primary Examiner.Art Unit 1671

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
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	3	÷	=	=	=	=	✓	✓	-	-
	4	÷	=	=	=	=	✓	✓	✓	-
	5	÷	-	-	-	-	-	-	-	-
	6	÷	=	=	=	=	✓	✓	✓	-
	7	÷	-	-	-	-	-	-	-	-
	8	÷	=	=	=	=	✓	✓	✓	-
	9	÷	-	-	-	-	-	-	-	-
	10	÷	-	-	-	-	-	-	-	-
	11	÷	-	-	-	-	-	-	-	-
	12	÷	-	-	-	-	-	-	-	-
	13	÷	-	-	-	-	-	-	-	-
	14	÷	-	-	-	-	-	-	-	-
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	29	÷	-	-	-	-	-	-	-	-
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	35	÷	-	-	-	-	-	-	-	-
	36	÷	-	-	-	-	-	-	-	-

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
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	70		=	=	=	=	✓	✓	✓	-
	71		=	=	=	=	✓	✓	✓	-
	72		=	=	=	=	✓	✓	✓	-

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
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	75		=	=	=	=	✓	✓	✓	-
	76		=	=	=	=	✓	✓	✓	-
	77		=	=	=	=	✓	✓	✓	-
	78		=	=	=	=	✓	✓	✓	-

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

CPC							
Symbol						Type	Version
C11B		1	/	10		F	2013-01-01
C11B		3	/	02		I	2013-01-01
C11B		3	/	16		I	2013-01-01
Y02E		50	/	16		A	2013-01-01
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			/				
			/				

CPC Combination Sets							
Symbol					Type	Set	Ranking	Version
			/					
			/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	02/20/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No. 20180220

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
554	8

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
435	134				
554	223	224	227		

INTERNATIONAL CLASSIFICATION																					
CLAIMED										NON-CLAIMED											
C	1	2	P	7 / 64 (2006.0)																	
C	1	1	B	1 / 00 (2006.0)																	
A	0	1	H	5 / 10 (2006.0)																	
A	2	3	D	9 / 00 (2006.0)																	

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	02/20/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	5		21		37	2	53		69						
	6		22		38	3	54		70						
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	13		29		45		61		77						
	14		30		46		62		78						
	15		31		47		63								
	16		32		48		64								

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	02/20/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office Part of Paper No. 20180220

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4906746		1990-03-06	Commissariat a l'Energie Atomique	
	2	6344349	B1	2002-02-05	Moldavsky et al.	
	3	6451567	B1	2002-09-17	Barclay, William	
	4	6509178		2003-01-21	Suntory Ltd. Nagase & Co. Ltd. Nagase Chemtex Corp	
	5	6582941	B1	2003-06-24	Director-General of Agency of Industrial Science;	
	6	6812001	B2	2004-11-02	Sibeijn et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	20050170479	A1	2005-08-04	Kobzeff et al.	
	2	20060099693		2006-05-11	NA	
	3	20070003686	A1	2007-01-04	Martek Biosciences Corporation	
	4	20080044876	A1	2008-02-21	Martek Biosciences Corporation	
	5	20080148433	A1	2008-06-19	Metz et al.	
	6	20090117194	A1	2009-05-07	Burja et al.	
	7	20110256268	A1	2011-10-20	Solazyme Inc.	
	8	20110283602	A1	2011-11-24	ICM Inc.	
	9	20120190872	A1	2012-07-26	Sapphire Energy Inc.	
	10	20120238732	A1	2012-09-20	Iowa State University Research Foundation	
	11	20120244584	A1	2012-09-27	Ocean Nutrition Canada Ltd	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	12	20130210093	A1	2013-08-15	IO-Mega Holding Corporation	
	13	20140212936	A1	2014-07-31	DSM IP Assets B.V.	
	14	20150176042	A1	2015-06-25	MARA Renewables Corporation	
	15	20160010026	A1	2016-01-14	MARA Renwables Corporation	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CA2076018	CA	C	1991-08-14	Martek Corporation		
	2	CA2146235	CA	C	1994-04-28	DSM IP Assets B.V.		
	3	CA2397655	CA	A1	2001-07-26	Omegatech Inc.		
	4	CA2611324	CA	A1	2007-06-21	DSM Nutritional Products AG		
	5	CA2801011	CA	A1	2011-12-08	DSM IP Assets B.V.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	6	EP1305440	EP	A2	2003-05-02	DSM N.V.		
	7	JP08-509355	JP		1996-10-08	Phycotech Inc		☒
	8	JP10-512444	JP		1998-12-02	Martek Biosciences Corporation	WO96/21037	☒
	9	WO20030092628	WO		2003-11-13	MARTEK BIOSCIENCES CORPORATION		☐
	10	WO2004001021	WO	A1	2003-12-31	DSM IP Assets B.V.		☐
	11	WO2013156720	WO	A2	2013-10-24	Roquette Freres		☐
	12	WO2015092546	WO	A1	2015-06-25	MARA Renewables Corporation		☐
	13	WO9408467	WO		1994-04-28	Omegatech Inc.		☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	ANONYMOUS, Food Standards Australia New Zealand, Dhasco and arasco oils as sources of long-chain polyunsaturated fatty acids in infant formula, 2003, 3-50, 22	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	2	CUELLAR-BERMUDEZ ET AL., Extraction and Purification of high-value metabolites from microalgae: essential lipids, astaxanthin and phycobiliproteins, Microbial Biotechnology, 2014, 190-209, 8	
	3	KAMISAKA ET AL, J. Biochem., Characterization of the Diacylglycerol Acyltransferase Activity in the Lipid Body Fraction from an Oleaginous Fungus, 1994, 1295-1301, 116	
	4	LIU GUANGCHENG, Several Demulsifying Methods, China Surfactant Detergent & Cosmetics, Dec 31 1983, 49-50	X
	5	LOWREY, JOSHUA, Nutrient recylcing of lipid-extracted waste in the production of an oleaginous thraustochytrid, Appl Microbiol Biotechnol, 2016, 4711-4721, 100	☐
	6	OLOFSSON ET AL., Seasonal Variation of Lipids and Fatty Acids of the Microalgae Nannochloropsis oculata Grown in Outdoor Large-Scale Photobioreactors, Energies, 2012, 1577-1592, 5(12)	☐
	7	THAKUR ET AL., De Novo Transciptome Sequencing and Analysis for Venturia inaequalis, the Devastating Apple Scab Pathogen, Plos One, January 2013, Vol 8 / Issue 1	☐
	8	YOU ET AL., Enzymatic hydrolysis and extraction of arachidonic acid rich lipids from Mortierella Alpina, Bioresource Technology, 2011, 6088-6094, 102	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-05-01
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:	13151014			
Filing Date:	01-Jun-2011			
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom			
First Named Inventor/Applicant Name:	Stephen Robert Cherinko			
Filer:	Shannon Elizabeth McGarrah			
Attorney Docket Number:	28612-US-NP			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	32496005
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah
Filer Authorized By:	
Attorney Docket Number:	28612-US-NP
Receipt Date:	01-MAY-2018
Filing Date:	01-JUN-2011
Time Stamp:	11:01:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	050118INTEFSW00030833506635
Deposit Account	506635
Authorized User	Kimberly Sauter-Bray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20180501_IDS_5_28612-US-NP.pdf	1034976 923aac58a25cabff344dd692acb3e88a24aab335	no	7
Warnings:					
Information:					
2	Foreign Reference	CA2076018.pdf	824403 ae1890c026b33403edb47550bf0aa4e9113b3b1c	no	26
Warnings:					
Information:					
3	Foreign Reference	CA2146235.pdf	2289858 806fa48d55fee3c3d4a6d38d8ec5f865eae4cb5f	no	67
Warnings:					
Information:					
4	Foreign Reference	CA2397655.pdf	1172037 edf4cfce43de86819525db4f89629f41a0381fd2	no	30
Warnings:					
Information:					
5	Foreign Reference	CA2611324.pdf	7441049 b744fada1e133a887856442 4ca68aec4228 1e5a1	no	111
Warnings:					
Information:					
6	Foreign Reference	CA2801011.pdf	10526982 517e9ae18801962e26881b46ea69550fa856ea48	no	164
Warnings:					
Information:					

7	Foreign Reference	EP1305440.pdf	24440 4d525572c438c37ffe09ac180418dcf1d429eaf	no	1
Warnings:					
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8	Foreign Reference	WO19960021037.pdf	1564439 cbca3c0520201921f4e8ea013566644196eae9c3	no	40
Warnings:					
Information:					
9	Foreign Reference	WO04001021.pdf	1560178 eb74f3f1ce686b4439d160274252e16744f1c592	no	33
Warnings:					
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10	Foreign Reference	WO13156720.pdf	364804 3b22b6c031205e6fea8ea2d19c9cf36afaf826c6	no	33
Warnings:					
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11	Foreign Reference	WO15092546.pdf	468384 a69318f7ad55d06941b5fd740666a35f8ed809cb	no	38
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12	Foreign Reference	WO9408467.pdf	2453491 5d62f74c5241c81eb5266884c2b64361a281cdf8	no	71
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13	Foreign Reference	JP08509355.pdf	908072 13eef5b3fdfec9963d6057991e8d5010b2a1f8db	no	47
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14	Foreign Reference	WO03092628_EF.pdf	10569126 d61c54d43da0546867dfae60702afd9f3cfb bd6b	no	18
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15	Non Patent Literature	Cuellar-Bermudez.pdf	1526047 7838b9cdb7aa09c59872755379d9e26252c 9e7c0	no	20
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16	Non Patent Literature	Guangcheng_1983_49-50.pdf	22682 71fe8327e4e1feef8f76e65d867dcacb0db2 df6d	no	1
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17	Non Patent Literature	Olofsson_2012.pdf	1028504 6eb43de94e8dfcf684948ddfc8014b8d858e 30b7	no	16
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18	Non Patent Literature	Thakur_2013_e53937.pdf	1690237 28da51413707d43c943f09b0ad97c311c02 3c38a	no	16
Warnings:					
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Warnings:					
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23	Fee Worksheet (SB06)	fee-info.pdf	30736 55c76b2dec64d7c0fbe1364a0a7b488be5ffa5af	no	2
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

7590 05/04/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	**PAPER NUMBER**
1671	
NOTIFICATION DATE	**DELIVERY MODE**
05/04/2018	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 05-01-2018 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

- ✱ The IDS lacks a statement as specified in 37 CFR 1.97(e).
- ☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).
- ☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

/bc/ Bernice Crittenden

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13151014	Filing Date	2011-06-01	Docket Number (if applicable)	28612-US-NP	Art Unit	1671
First Named Inventor	Stephen Robert Cherinko			Examiner Name	Carr, Deborah D.		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the orde in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☐ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506635

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

X Patent Practitioner Signature

Applicant Signature

EFS - Web 2.1.15

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Signature of Registered U.S. Patent Practitioner			
Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-05-04
Name	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is t
file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection
estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Tim
will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions fo
reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce,
P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4906746		1990-03-06	Commissariat a l'Energie Atomique	
	2	6344349	B1	2002-02-05	Moldavsky et al.	
	3	6451567	B1	2002-09-17	Barclay, William	
	4	6509178		2003-01-21	Suntory Ltd. Nagase & Co. Ltd. Nagase Chemtex Corp	
	5	6582941	B1	2003-06-24	Director-General of Agency of Industrial Science;	
	6	6812001	B2	2004-11-02	Sibeijn et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	20050170479	A1	2005-08-04	Kobzeff et al.	
	2	20060099693		2006-05-11	NA	
	3	20070003686	A1	2007-01-04	Martek Biosciences Corporation	
	4	20080044876	A1	2008-02-21	Martek Biosciences Corporation	
	5	20080148433	A1	2008-06-19	Metz et al.	
	6	20090117194	A1	2009-05-07	Burja et al.	
	7	20110256268	A1	2011-10-20	Solazyme Inc.	
	8	20110283602	A1	2011-11-24	ICM Inc.	
	9	20120190872	A1	2012-07-26	Sapphire Energy Inc.	
	10	20120238732	A1	2012-09-20	Iowa State University Research Foundation	
	11	20120244584	A1	2012-09-27	Ocean Nutrition Canada Ltd	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	12	20130210093	A1	2013-08-15	IO-Mega Holding Corporation	
	13	20140212936	A1	2014-07-31	DSM IP Assets B.V.	
	14	20150176042	A1	2015-06-25	MARA Renewables Corporation	
	15	20160010026	A1	2016-01-14	MARA Renwables Corporation	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CA2076018	CA	C	1991-08-14	Martek Corporation		
	2	CA2146235	CA	C	1994-04-28	DSM IP Assets B.V.		
	3	CA2397655	CA	A1	2001-07-26	Omegatech Inc.		
	4	CA2611324	CA	A1	2007-06-21	DSM Nutritional Products AG		
	5	CA2801011	CA	A1	2011-12-08	DSM IP Assets B.V.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	6	EP1305440	EP	A2	2003-05-02	DSM N.V.		
	7	JP08-509355	JP		1996-10-08	Phycotech Inc		X
	8	JP10-512444	JP		1998-12-02	Martek Biosciences Corporation	WO96/21037	☒
	9	WO20030092628	WO		2003-11-13	MARTEK BIOSCIENCES CORPORATION		☐
	10	WO2004001021	WO	A1	2003-12-31	DSM IP Assets B.V.		☐
	11	WO2013156720	WO	A2	2013-10-24	Roquette Freres		☐
	12	WO2015092546	WO	A1	2015-06-25	MARA Renewables Corporation		☐
	13	WO9408467	WO		1994-04-28	Omegatech Inc.		☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	ANONYMOUS, Food Standards Australia New Zealand, Dhasco and arasco oils as sources of long-chain polyunsaturated fatty acids in infant formula, 2003, 3-50, 22	

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	2	CUELLAR-BERMUDEZ ET AL., Extraction and Purification of high-value metabolites from microalgae: essential lipids, astaxanthin and phycobiliproteins, Microbial Biotechnology, 2014, 190-209, 8	
	3	KAMISAKA ET AL, J. Biochem., Characterization of the Diacylglycerol Acyltransferase Activity in the Lipid Body Fraction from an Oleaginous Fungus, 1994, 1295-1301, 116	
	4	LIU GUANGCHENG, Several Demulsifying Methods, China Surfactant Detergent & Cosmetics, Dec 31 1983, 49-50	X
	5	LOWREY, JOSHUA, Nutrient recylcing of lipid-extracted waste in the production of an oleaginous thraustochytrid, Appl Microbiol Biotechnol, 2016, 4711-4721, 100	☐
	6	OLOFSSON ET AL., Seasonal Variation of Lipids and Fatty Acids of the Microalgae Nannochloropsis oculata Grown in Outdoor Large-Scale Photobioreactors, Energies, 2012, 1577-1592, 5(12)	☐
	7	THAKUR ET AL., De Novo Transciptome Sequencing and Analysis for Venturia inaequalis, the Devastating Apple Scab Pathogen, Plos One, January 2013, Vol 8 / Issue 1	☐
	8	YOU ET AL., Enzymatic hydrolysis and extraction of arachidonic acid rich lipids from Mortierella Alpina, Bioresource Technology, 2011, 6088-6094, 102	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-05-01
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:	13151014			
Filing Date:	01-Jun-2011			
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom			
First Named Inventor/Applicant Name:	Stephen Robert Cherinko			
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray			
Attorney Docket Number:	28612-US-NP			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**2140**

Electronic Acknowledgement Receipt	
EFS ID:	32532197
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	04-MAY-2018
Filing Date:	01-JUN-2011
Time Stamp:	11:24:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$2140
RAM confirmation Number	050418INTEFSW00009504506635
Deposit Account	506635
Authorized User	Kimberly Sauter-Bray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

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37 CFR 1.20 (Post Issuance fees)

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1	Request for Continued Examination (RCE)	20180504_RCE_28612-US-NP.pdf	797736 34f11905e15cc127dc5a51da75dffe8c232053ff	no	3
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	20180501_IDS_5_28612-US-NP.pdf	1034976 923aac58a25cabff344dd692acb3e88a24aab335	no	7
Warnings:					
Information:					
3	Foreign Reference	CA2076018.pdf	824403 ae1890c026a33403edb47550bf0aa4e9113b3b1c	no	26
Warnings:					
Information:					
4	Foreign Reference	CA2146235.pdf	2289858 806fa48d55fee3c3d4a6d38d8ec5f865eae4cb5f	no	67
Warnings:					
Information:					
5	Foreign Reference	CA2397655.pdf	1172037 edf4cfce43de86819525db4f89629ff41a0381fd2	no	30
Warnings:					
Information:					
6	Foreign Reference	CA2611324.pdf	7441049 b744fada1e133a887856442 4ca68aec42281e5a1	no	111
Warnings:					
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7	Foreign Reference	CA2801011.pdf	10526982 517e9ae18801962e26881b46ea69550fa856ea48	no	164
Warnings:					
Information:					
8	Foreign Reference	EP1305440.pdf	24440 4d525572c438c37ffe09ac1804418dcf1d429eaf	no	1
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9	Foreign Reference	JP08509355.pdf	908072 13eef5b3fdfec9963d6057991e8d5010b2a1f8db	no	47
Warnings:					
Information:					
10	Foreign Reference	JP10512444.pdf	2151490 3be95eba65de25d59c72bb58cee3c899a9302194	no	47
Warnings:					
Information:					
11	Foreign Reference	WO04001021.pdf	1560178 eb74f3f1ce686b4439d160274252e16744f1c592	no	33
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12	Foreign Reference	WO13156720.pdf	364804 3b22b6c031205e6faa8ea2d19c9cf36afaf826c6	no	33
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17	Non Patent Literature	Lowrey_2016_4711-4721_E.pdf	384079 04fd2410cc0f002a79a51a43163c19e98c487709	no	12
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23	Fee Worksheet (SB06)	fee-info.pdf	32520 08ab80da3e184e96a556357058968b145eb2d8bc	no	2
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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NOTICE OF ALLOWANCE AND FEE(S) DUE

109143 7590 05/22/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	PAPER NUMBER
1671	

DATE MAILED: 05/22/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: Extraction of Lipid From Cells and Products Therefrom

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$0	$1000	08/22/2018

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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109143 7590 05/22/2018
DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: Extraction of Lipid From Cells and Products Therefrom

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$0	$1000	08/22/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
CARR, DEBORAH D	1671	554-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

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❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 05/22/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	PAPER NUMBER
1671	

DATE MAILED: 05/22/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/151,014	Applicant(s) CHERINKO ET AL.	
	Examiner DEBORAH D. CARR	Art Unit 1671	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the response filed 4 May 2018*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *52-58*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 05/2018
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DEBORAH D CARR/
Primary Examiner
Art Unit: 1671

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1671

CPC- SEARCHED		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018	DDC
C11B3/02	9/2015, 1/2016, 7/2016	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018	DDC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018	ddc

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner

	/DEBORAH D CARR/ Primary Examiner.Art Unit 1671

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
see transcript	8/2014	ddc
updated search	1/2015	ddc
updated search	9/2015	ddc
updated search	1/2016	ddc
updated search	7/2016	ddc
updated search	1/2017	ddc
updates search	2/2018	ddc
updated search	5/2018	

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
435	134	8/2014, 2/2018, 5/2018	ddc
554	8, 223, 224, 227	8/2014, 2/2018, 5/2018	ddc
see areas searched		9/2015, 1/2016, 2/2018, 5/2018	ddc

	/DEBORAH D CARR/ Primary Examiner.Art Unit 1671

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
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	3	÷	=	=	=	=	✓	✓	-	-
	4	÷	=	=	=	=	✓	✓	✓	-
	5	÷	-	-	-	-	-	-	-	-
	6	÷	=	=	=	=	✓	✓	✓	-
	7	÷	-	-	-	-	-	-	-	-
	8	÷	=	=	=	=	✓	✓	✓	-
	9	÷	-	-	-	-	-	-	-	-
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	30	÷	-	-	-	-	-	-	-	-
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	32	÷	=	=	=	=	✓	✓	✓	-
	33	÷	=	-	=	=	✓	✓	✓	-
	34	÷	-	-	-	-	-	-	-	-
	35	÷	-	-	-	-	-	-	-	-
	36	÷	-	-	-	-	-	-	-	-

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	**Art Unit**
	DEBORAH D CARR	1672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
	37	÷	-	-	-	-	-	-	-	-
	38	÷	-	-	-	-	-	-	-	-
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	70		=	=	=	=	✓	✓	✓	-
	71		=	=	=	=	✓	✓	✓	-
	72		=	=	=	=	✓	✓	✓	-

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
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☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
	73		=	=	=	=	✓	✓	✓	-
	74		=	=	=	=	✓	✓	✓	-
	75		=	=	=	=	✓	✓	✓	-
	76		=	=	=	=	✓	✓	✓	-
	77		=	=	=	=	✓	✓	✓	-
	78		=	=	=	=	✓	✓	✓	-

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4906746		1990-03-06	Commissariat a l'Energie Atomique	
	2	6344349	B1	2002-02-05	Moldavsky et al.	
	3	6451567	B1	2002-09-17	Barclay, William	
	4	6509178		2003-01-21	Suntory Ltd. Nagase & Co. Ltd. Nagase Chemtex Corp	
	5	6582941	B1	2003-06-24	Director-General of Agency of Industrial Science;	
	6	6812001	B2	2004-11-02	Sibeijn et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
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	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	20050170479	A1	2005-08-04	Kobzeff et al.	
	2	20060099693		2006-05-11	NA	
	3	20070003686	A1	2007-01-04	Martek Biosciences Corporation	
	4	20080044876	A1	2008-02-21	Martek Biosciences Corporation	
	5	20080148433	A1	2008-06-19	Metz et al.	
	6	20090117194	A1	2009-05-07	Burja et al.	
	7	20110256268	A1	2011-10-20	Solazyme Inc.	
	8	20110283602	A1	2011-11-24	ICM Inc.	
	9	20120190872	A1	2012-07-26	Sapphire Energy Inc.	
	10	20120238732	A1	2012-09-20	Iowa State University Research Foundation	
	11	20120244584	A1	2012-09-27	Ocean Nutrition Canada Ltd	

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	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	12	20130210093	A1	2013-08-15	IO-Mega Holding Corporation	
	13	20140212936	A1	2014-07-31	DSM IP Assets B.V.	
	14	20150176042	A1	2015-06-25	MARA Renewables Corporation	
	15	20160010026	A1	2016-01-14	MARA Renwables Corporation	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CA2076018	CA	C	1991-08-14	Martek Corporation		
	2	CA2146235	CA	C	1994-04-28	DSM IP Assets B.V.		
	3	CA2397655	CA	A1	2001-07-26	Omegatech Inc.		
	4	CA2611324	CA	A1	2007-06-21	DSM Nutritional Products AG		
	5	CA2801011	CA	A1	2011-12-08	DSM IP Assets B.V.		

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	6	EP1305440	EP	A2	2003-05-02	DSM N.V.		
	7	JP08-509355	JP		1996-10-08	Phycotech Inc		X
	8	JP10-512444	JP		1998-12-02	Martek Biosciences Corporation	WO96/21037	☒
	9	WO20030092628	WO		2003-11-13	MARTEK BIOSCIENCES CORPORATION		☐
	10	WO2004001021	WO	A1	2003-12-31	DSM IP Assets B.V.		☐
	11	WO2013156720	WO	A2	2013-10-24	Roquette Freres		☐
	12	WO2015092546	WO	A1	2015-06-25	MARA Renewables Corporation		☐
	13	WO9408467	WO		1994-04-28	Omegatech Inc.		☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	ANONYMOUS, Food Standards Australia New Zealand, Dhasco and arasco oils as sources of long-chain polyunsaturated fatty acids in infant formula, 2003, 3-50, 22	

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

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	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	2	CUELLAR-BERMUDEZ ET AL., Extraction and Purification of high-value metabolites from microalgae: essential lipids, astaxanthin and phycobiliproteins, Microbial Biotechnology, 2014, 190-209, 8	
	3	KAMISAKA ET AL, J. Biochem., Characterization of the Diacylglycerol Acyltransferase Activity in the Lipid Body Fraction from an Oleaginous Fungus, 1994, 1295-1301, 116	
	4	LIU GUANGCHENG, Several Demulsifying Methods, China Surfactant Detergent & Cosmetics, Dec 31 1983, 49-50	X
	5	LOWREY, JOSHUA, Nutrient recylcing of lipid-extracted waste in the production of an oleaginous thraustochytrid, Appl Microbiol Biotechnol, 2016, 4711-4721, 100	☐
	6	OLOFSSON ET AL., Seasonal Variation of Lipids and Fatty Acids of the Microalgae Nannochloropsis oculata Grown in Outdoor Large-Scale Photobioreactors, Energies, 2012, 1577-1592, 5(12)	☐
	7	THAKUR ET AL., De Novo Transciptome Sequencing and Analysis for Venturia inaequalis, the Devastating Apple Scab Pathogen, Plos One, January 2013, Vol 8 / Issue 1	☐
	8	YOU ET AL., Enzymatic hydrolysis and extraction of arachidonic acid rich lipids from Mortierella Alpina, Bioresource Technology, 2011, 6088-6094, 102	☐

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Examiner Signature	/DEBORAH D CARR/	Date Considered	05/14/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-05-01
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

CPC						
Symbol					Type	Version
C11B		1	/	10	F	2013-01-01
C11B		3	/	02	I	2013-01-01
C11B		3	/	16	I	2013-01-01
Y02E		50	/	16	A	2013-01-01
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CPC Combination Sets							
Symbol					Type	Set	Ranking	Version
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NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	05/14/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

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	Examiner	**Art Unit**
	DEBORAH D CARR	1672

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS					CLAIMED						NON-CLAIMED				
554	8					C	1	2	P	7 / 64 (2006.0)						
CROSS REFERENCE(S)						C	1	1	B	1 / 00 (2006.0)						
						A	0	1	H	5 / 10 (2006.0)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					A	2	3	D	9 / 00 (2006.0)						
435	134															
554	223	224	227													

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	05/14/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

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	13151014	CHERINKO ET AL.
	Examiner	Art Unit
	DEBORAH D CARR	1672

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17		33		49		65						
	2		18		34		50		66						
	3		19		35		51		67						
	4		20		36	1	52		68						
	5		21		37	2	53		69						
	6		22		38	3	54		70						
	7		23		39	4	55		71						
	8		24		40	5	56		72						
	9		25		41	6	57		73						
	10		26		42	7	58		74						
	11		27		43		59		75						
	12		28		44		60		76						
	13		29		45		61		77						
	14		30		46		62		78						
	15		31		47		63								
	16		32		48		64								

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	05/14/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No. 20180514

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13151014	Filing Date	2011-06-01	Docket Number (if applicable)	28612-US-NP	Art Unit	1672
First Named Inventor	Stephen Robert Cherinko			Examiner Name	Deborah D. Carr		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the orde in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

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MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506635

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

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Applicant Signature

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PTO/SB/30EFS (07-14)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Signature of Registered U.S. Patent Practitioner			
Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name	Shannon McGarrah	Registration Number	55442

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah D.
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	2753362		1956-07-03	Standard Brands Incorporated	
	2	3089821		1983-05-14	Merck & Co., Inc.	
	3	4504473		1985-03-12	Ribi ImmunoChem Research Inc.	
	4	4720456		1988-01-19	Wintershall AG	
	5	4792418		1988-12-20	Century Laboratories Inc.	
	6	5010004		2001-04-23	Agency of Industrial Science & Technology	Eng Equiv of JP01-98494
	7	5133963		1992-07-28	Shuntaro Ise	
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	9	5288619		1994-02-22	Kraft General Foods, Inc.	
	10	5338673		1994-08-16	Commissariat a L'Energie Atomique	
	11	5340742		1994-08-23	Omegatech, Inc.	
	12	5397591		1995-03-14	Martek Biosciences Corporation	
	13	5492938		1996-02-20	Martek Biosciences Corporation	
	14	5539133		1996-07-23	Milupa Aktiengesellschaft	
	15	5897994		1999-04-27	Nestec S.A.	
	16	5928696		1999-07-27	Dr. Frische GmbH	
	17	5969169		1999-10-19	Cargill Inc.	
	18	6127185		2000-10-03	University of Tennessee Research Corporation	
	19	6166231		2000-12-26	Martek Biosciences Corporation	

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	20	6201145	B1	2001-03-13	Cargill Inc.	
	21	6204401	B1	2001-03-20	Norsk Hydro ASA	
	22	6255505	B1	2001-07-03	Gist-Brocades B.V.	
	23	6270828	B1	2001-08-07	Cargill Inc.	
	24	6528941	B1	2003-03-04	Mitsubishi Denki Kabushiki Kaisha	Eng Equiv of JP09-000284
	25	6541049	B2	2002-04-01	Martek Biosciences Coulder	
	26	6607900	B2	2003-08-19	Martek Biosciences Boulder	
	27	6750048	B2	2004-06-15	Martek Biosciences Corporation	Eng Equiv of JP2003520046
	28	6905861	B2	2005-06-14	Daicel Chemical Industries	Eng Equiv of JP200051684
	29	6958229	B2	2005-10-25	Suntory Limited	
	30	7351558	B2	2008-04-01	Martek Biosciences Corporation	Eng Equiv of JP2005278650

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	31	7431952	B2	2008-10-07	DSM IP Assets B.V.	Eng Equiv of JP2004504849
	32	7662598	B2	2010-02-16	Martek Biosciences Corporation	
	33	7781193	B2	2010-08-24	Martek Biosciences Corporation	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20070077341	A1	2007-04-05	Schlegel et al.	
	2	20080026103	A1	2008-01-31	Martek Biosciences Corp.	
	3	20080038800	A1	2008-02-14	Martek Biosciences Corp.	
	4	20080044875	A1	2008-02-21	Martek Biosciences Corp.	
	5	20090061067	A9	2009-03-05	Aker BioMarine, Inc.	
	6	20100227042	A1	2010-09-09	Danisco US Inc.	

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	7	20100233761	A1	2010-09-16	Czartoski et al.	
	8	20110086386		2011-04-14	Czartoski et al.	
	9	20110252696	A1	2011-10-20	Solazyme Inc.	
	10	20110263709		2011-10-27	E. I. DuPont De Nemours and Company	
	11	20110295028		2011-12-01	Martek Biosciences Corporation	
	12	20120095246	A1	2012-04-19	DSM IP Assets B.V.	Eng Equiv of JP2007520213
	13	20120119862		2012-05-17	Solazyme, Inc.	
	14	20120130099		2012-05-24	Solazyme, Inc.	

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	1	DE2056896	DE		1971-08-26	VEB	Machine Translation	

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	2	EP0246324	EP		1986-07-31	Director General of Agency of Industrial Science a	Eng Equiv of JP61-270397	
	3	EP0969086	EP		2000-01-05	Sagami Chemical Research Center		
	4	EP0976828	EP	A1	2000-02-02	Daicel Chemical Industries	Eng Eqiuiv of JP2000-41684	
	5	EP1178103	EP	A1	2002-02-06	DSM N.V.		
	6	EP1178118	EP	A1	2002-02-06	DSM N.V.		
	7	EP1252324	EP	B1	2010-10-20	Martek Biosciences Corporation		
	8	GB1466853	GB		1977-03-09	Simon-Rosedowns Limited		
	9	GB808128	GB		1959-01-28	National Research and Development Corporation		
	10	JP01098494	JP		1991-04-23	Agency of Industrial Science & Technology	Eng Equiv US5010004	
	11	JP08302384	JP	A2	1996-11-19	Soc Prod Nestle SA	Eng Abstract	
	12	JP08509355	JP		1998-03-17	Phycotech Inc.	Machine Translation	

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	13	JP09000284	JP		1997-01-07	Agency of Industrial Science & Technology	Eng Abstract	
	14	JP09009981	JP		1997-01-14	Mitsubishi Oil Co Ltd	Eng Abstract	
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	16	JP11116983	JP		1999-04-27	Nippon Kagaku Shiryo	Partial Eng. Trans.	
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	18	JP2000041684	JP		1999-07-29	Daicel Chemical Industries	Eng Equiv EP0976828	
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	40	WO1997036996	WO		1997-10-09	Gist-Brocades B.V.		☐
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Title of Invention:	Extraction of Lipid From Cells and Products Therefrom			
First Named Inventor/Applicant Name:	Stephen Robert Cherinko			
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray			
Attorney Docket Number:	28612-US-NP			
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah D.
Attorney Docket Number	28612-US-NP

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	55	WO2010138620	WO	A1	2010-12-02			☐
	56	WO2011059745	WO	A1	2011-05-19			☐

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	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

	57	WO2011133181	WO	A1	2011-10-27			☐
	58	WO2012061647	WO	A2	2012-05-10			☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing *(day/month/year)*	06 MAY 2002
Applicant's or agent's file reference: 2997-19-PCT	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority Date *(day/month/year)*
PCT/US01/01806	19 JANUARY 2001	19 JANUARY 2000

Applicant: OMEGATECH, INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	CHRISTOPHER TATE Faye Bridges for
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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2997-19-PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001	Priority date *(day/month/year)* 19 JANUARY 2000
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant OMEGATECH, INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 26 sheets.

3. This report contains indications relating to the following items:

   I ☒ Basis of the report

   II ☐ Priority

   III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability

   IV ☒ Lack of unity of invention

   V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   VI ☐ Certain documents cited

   VII ☐ Certain defects in the international application

   VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
02 JULY 2001	26 MARCH 2002
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer Taylor Bridges for CHRISTOPHER TATE Telephone No. (703) 308-0196

Form PCT/IPEA/409 (cover sheet) (July 1998)★

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/01806

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:
pages (See Attached) , as originally filed
pages , filed with the demand
pages , filed with the letter of

☒ the claims:
pages (See Attached) , as originally filed
pages , as amended (together with any statement) under Article 19
pages , filed with the demand
pages , filed with the letter of

☒ the drawings:
pages (See Attached) , as originally filed
pages , filed with the demand
pages , filed with the letter of

☒ the sequence listing part of the description:
pages (See Attached) , as originally filed
pages , filed with the demand
pages , filed with the letter of

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the writen sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages NONE

☒ the claims, Nos. NONE

☒ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

***Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

Form PCT/IPEA/409 (Box I) (July 1998)★

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/01806

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- [ ] restricted the claims.
- [X] paid additional fees.
- [ ] paid additional fees under protest.
- [ ] neither restricted nor paid additional fees.

2. [ ] This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- [ ] complied with.
- [X] not complied with for the following reasons:

Please See Supplemental Sheet.

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- [X] all parts.
- [ ] the parts relating to claims Nos. .

Form PCT/IPEA/409 (Box IV) (July 1998)*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/01806

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	2-5, 8-86	YES
	Claims	1, 6, 7	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-86	NO
Industrial Applicability (IA)	Claims	1-86	YES
	Claims	NONE	NO

2. citations and explanations (Rule 70.7)

Claims 1, 6, and 7 lack novelty under PCT Article 33(2) as being anticipated by Gudin et al. (US 5,179,012).

Gudin et al. teaches a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7 (see, for example, column 2, line 37 - column 6, line 4).

Claims 1-86 lack an inventive step under PCT Article 33(3) as being obvious over Gudin et al. (US 5,179,012) in view of Tanaka et al. (WO 98/03671), Barclay (US 5,180,242), Best et al. (US 5,928,696), Wagner (US 4,720,456), and/or Kohn et al. (US 5,539,133).

Gudin et al. teach a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7.

The secondary references disclose other conventional steps/procedures used to beneficially obtain lipid (for example, liposoluble components)from microorganisms/cells (see, for example, Tanaka et al: column page 2, line 32 - page 11, line 23; Barclay: column 4, line 52 - column 13, line 49; Best et al: entire document; Wagner et al: column 1, lines 8-28; Kohn et al: column 1, line 10 - column 5, line 20) including those claimed.

It would have been obvious to one of ordinary skill in the art to incorporate other conventional art-recognized steps, such as those beneficially disclosed by the secondary references, within the process taught by Gudin so as to more effectively obtained high yields of desired lipid (liposoluble components) from such microorganisms, as well as to remove undesired solvents therefrom. Claimed limitations not expressly disclosed by the above teachings, including particular properties of such lipids, would be intrinsic thereto and/or obvious based upon the cited teachings as a whole.

(Continued on Supplemental Sheet.)

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

CLASSIFICATION:
The International Patent Classification (IPC) and/or the National classification are as listed below:
IPC(7): C12P 7/64, 1/04, 1/02; C12N 1/12; C12M 1/33, 3/08 and US Cl.: 435/134, 170, 171, 306.1, 946

I. BASIS OF REPORT:

This report has been drawn on the basis of the description,
page(s) NONE, as originally filed.
page(s) NONE, filed with the demand.
and additional amendments:
Pages 1-16, filed with the letter of 26 November 2001.

This report has been drawn on the basis of the claims,
page(s) NONE, as originally filed.
page(s) NONE, as amended under Article 19.
page(s) NONE, filed with the demand.
and additional amendments:
Pages 17-26, filed with the letter of 26 November 2001.

This report has been drawn on the basis of the drawings,
page(s) 1, as originally filed.
page(s) NONE, filed with the demand.
and additional amendments:
NONE

This report has been drawn on the basis of the sequence listing part of the description:
page(s) NONE, as originally filed.
pages(s) NONE, filed with the demand.
and additional amendments:
NONE

IV. LACK OF UNITY OF INVENTION:

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2, and 13.3 is not complied with for the following reasons:
As applicant was previously notified this International Preliminary Examining Authority has found plural inventions claimed in the International Application covered by the claims indicated below:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-46, drawn to a method of obtaining lipid from icroorganisms comprising a step of lysing the microbial cells.

Group II, claim(s) 47-82, drawn to a method of obtaining lipid from microorganisms which does not necessarily comprise a step of lysing.

Group III, claim(s) 83-84, drawn to a lipid derived from a microorganism which has less than 0.2 ppm residual nonpolar organic solvent.

Group IV, claim(s) 85-86, drawn to a lipid comprising greater than 15% cholesterol and/or other fatty acids.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

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and it considers that the International Application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated below:

The inventions listed as Groups I-IV do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The Group I process involves a step of lysing the microbial cells to produce a lysed cell mixture whereas the Group II process does not necessarily involve such a step. The special technical feature of the Group IV lipid is that it comprises greater than 15% cholesterol and/or other fatty acid, which is not shared by the lipid of Group III. Further, the lipids of Groups III and IV do not require that they be obtained using the special technical feature steps of the Group I process or of the Group II process.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):

---------- NEW CITATIONS ----------
NONE

SOLVENTLESS EXTRACTION PROCESS

FIELD OF THE INVENTION

The present invention is directed to a process for extracting lipids from microorganisms without the use of any significant amount of a nonpolar organic solvent.

BACKGROUND OF THE INVENTION

A typical microorganism lipid manufacturing process, such as production of omega-3 highly unsaturated fatty acid, in particular, a lipid mixture rich in docosahexaenoic acid (DHA), involves growing microorganisms which are capable of producing the desired lipid in a fermentor, pond or bioreactor, isolating the microbial biomass, drying it, and extracting intracellular lipids with a nonpolar organic solvent, *e.g.*, hexane. Generally, intracellular lipids of microorganisms are extracted after rupturing (i.e., lysing) dried cells of the microorganisms. The extracted lipids are can be further refined to produce high purity and/or quality lipids. The microorganisms are generally isolated by first diluting the fermentation broth with water, and centrifuging the mixture to isolate microorganisms. The cells are then dried and if the lipids are not extracted immediately or soon thereafter, the cells are packaged, for example, in vacuum-sealed bags, to prevent degradation of lipids.

Unfortunately, the drying process exposes the microorganisms to heat, which can damage, *i.e.*, degrade the quality of, lipids if done incorrectly. The vacuum-sealed bags may develop leaks, which can further degrade the quality of the lipids due to exposure of the microorganisms to air. In addition, if the dried microorganisms are not treated with an antioxidant, lipids can be further degraded due to exposure to air and or light. For example, carotenoids, xanthophylls and long chain fatty acids like DHA may degrade due to oxidation by air and/or light. Furthermore, in some cases operators who are exposed to the dried microorganisms can develop an allergic reaction creating a safety and/or health hazard to operators.

Moreover, in an industrial scale production, the large amount of volatile and flammable nonpolar organic solvent used in lipid extraction can create hazardous operating conditions. The use of nonpolar organic solvent in the extraction process may necessitate using an explosion-proof oil recovery system, thereby adding to the cost of lipid recovery. Moreover, use of a nonpolar organic solvent in extracting lipids from

microorganisms generates a nonpolar organic solvent waste stream requiring a proper disposal method, which further increases the overall production cost of lipid extraction.

Therefore, there is a need for a process for extracting lipids from microorganisms which does not require the use of a nonpolar organic solvent. There is also a need for a lipid extraction process from microorganisms which does not require the expensive step of drying the microorganisms prior to extraction.

SUMMARY OF THE INVENTION

One embodiment of the present invention provides a process for obtaining lipid from microorganisms comprising:

(a) lysing cells of the microorganisms to produce a lysed cell mixture;

(b) treating the lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a lipid-rich light layer;

(c) separating the heavy layer from the lipid-rich light layer; and

(d) obtaining the lipid and/or lipid fractions from the light layer.

Another embodiment of the present invention provides a process for obtaining lipids from microorganisms comprising:

(a) growing microorganisms in a culture medium;

(b) treating said culture medium and the microorganism cells to release intercellular lipids;

(c) subjecting the culture medium containing the released intercellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

In accordance with another embodiment of the present invention, a process is provided for recovering lipids from microorganisms comprising the steps:

(a) growing said microorganisms in a culture medium;

(b) treating microorganism cells from said culture medium without drying said cells to release intercellular lipids;

(c) subjecting the culture medium containing the released intercellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

Preferably, the microorganisms are cultured in a fermentation medium in a fermentor. Alternatively, the microorganisms can be cultured photosynthetically in a photobioreactor or pond. Preferably, the microorganisms are lipid-rich microorganisms, more preferably, the microorganisms are selected from the group consisting of algae, bacteria, fungi and protists, more preferably, the microorganisms are selected from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles. Preferably, the microorganisms comprise microorganisms of the genus Mortierella, genus Crypthecodinium, and order Thraustochytriales, and more preferably, microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* or mixtures thereof, more preferably, the microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

The treatment of the cells includes a treatment to release the lipids such as lysing, rupturing or permeabilizing. As used herein, the terms lyse, lysing, lysed, etc., will be used generically to refer to a treatment to release intercellular lipids, including breaking or permeabilizing the cells. Preferably, the treatment is selected from the group consisting of heating the cells, exposing the cells to basic conditions, exposing the cells to a chelating compound or combinations thereof. More preferably the lysing or rupturing of the cells comprises heating the cells to at least 50°C while exposing the cells to basic conditions, a chelating compound or mixtures thereof.

Preferably, the gravity separation comprises passing the fermentation broth containing the released intercellular lipids through a centrifuge, such as stacked-disc-, separator- or decanter-type centrifuges.

AMENDED SHEET

The separated lysed cell mixture comprises a heavy layer which comprises an aqueous solution which contains the solid materials resulting from the lysed cells, and a light layer which contains lipids. The light and heavy layers can be separated by centrifugation. The lipids may be present in an emulsified state. The light layer can be further washed with an aqueous washing solution until the lipid becomes substantially non-emulsified. Preferably the treatment to break the emulsion comprises mixing the emulsion with water, alcohol, acetone or mixtures thereof and subjecting the mixture to gravity separation. Preferably, the process is performed without using nonpolar organic solvents such as hexane.

When the lipid extraction process of the present invention includes using microorganisms from a fermentation process, the extraction process can also include solubilizing at least part of proteinaceous compounds in a fermentation broth by adding a base selected from the group consisting of hydroxides, carbonates, bicarbonates, phosphates and mixtures thereof.

The process of the present invention can also include heating the microorganisms to temperature of at least about 50 °C. Preferably, a chemical compound, such as a base, is added to the culture medium to aid in the lysing of the cells.

As an alternative to heating, the cells can be lysed with the assistance of a chelating compound such as EDTA. In addition to assisting in lysing or rupturing the cells, the chelators assist in preventing oxidation of the lipids during processing by chelating (binding with) free radical-producing metal ions in the fermentation broth such as iron or copper. Preferred forms of chelators are those that are considered food grade or GRAS (Generally Recognized As Safe). Effective chelating compounds include EDTA, citric acid or citrate, lactic acid, trisodium phosphate, polyphosphate, hexametaphosphate, EGTA, DTPA, phytic acid, or CDTA and other salt forms of these compounds. In one embodiment, sodium EDTA is added to the cells to degrade the cell walls by chelating the divalent cations which assist in holding the cell walls together. The process can be performed at higher temperatures with less EDTA or lower temperatures with higher concentrations of EDTA. For example, we have found that DHA-rich cells of *Schizochytrium* sp. can be permeabilized and/or ruptured by addition of EDTA to the cultures at the end of the fermentation process. A concentration of 10,000 ppm is required to assist in rupturing the cells at 30°C, a concentration of 5,000 ppm at 50°C and at temperatures above 70°C concentrations of lower than 1000 ppm are effective. Chelators can be added to the fermentation broth to make the cells easier to break by

physical processes such as homogenization. In addition to a chelator, water can also be added to increase the internal osmotic pressure in order to lyse the cells.

Preferably, the microorganisms are capable of growth at salinity level of less than about 12 g/L of sodium chloride, more preferably less than about 5 g/L of sodium chloride and most preferably less than about 3 g/L of sodium chloride. Preferably, the microorganisms are capable of growth at salinity levels of less than about 7 g/L of sodium and less than about 250 mg/L of chloride. Preferably, the chloride is present in an amount from about 70 to about 150 mg/L.

Preferably, the microorganisms comprise at least about 20% by weight of lipid, more preferably at least about 30% by weight, and most preferably at least about 40%. Alternatively at least about 20% of the lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof, preferably at least about 30%, and more preferably at least about 40%.

In one particular aspect of the present invention the microorganisms are capable of producing at least about 0.1 grams per liter per hour of a mixture of lipids, preferably including cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof, more preferably at least about 0.2 g/L/h, still more preferably at least about 0.3 g/L/h, and most preferably at least about 0.4 g/L/h.

In another aspect of the present invention, the microorganism is selected from the group consisting of algae, fungi, bacteria and protists. Preferably, the microorganisms are of the order Thraustochytriales. More preferably the microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof. And most preferably, the microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, mutant strains derived from any

of the foregoing, and mixtures thereof. Preferably, the microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888 and ATCC number 20889, and more preferably ATCC number 20888, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a flow diagram of one embodiment of a solventless extraction process of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a process for extracting, recovering, isolating or obtaining lipids from microorganisms. The process of the present invention is applicable to extracting a variety of lipids from a variety of microorganisms, for example, extracting lipids containing cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof, more preferably, omega-3 highly unsaturated fatty acids, such as docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and/or docosapentaenoic acid (DPA) (i.e., the omega-3 form of DPA), in particular lipids containing a relatively large amount of DHA, from microorganisms producing the same; and extracting lipids containing omega-6 highly unsaturated fatty acids, such as arachidonic acid and docosapentaenoic acid (DPA) (i.e., the omega-6 form of DPA)from microorganisms producing the same. Exemplary microorganisms which produce a relatively large amount of omega-3 highly unsaturated fatty acids are disclosed in commonly assigned U.S. Patent Nos. 5,340,594 and 5,340,742, both issued to Barclay, and exemplary microorganisms which produce a relatively large amount of arachidonic acid are disclosed in commonly assigned U.S. Patent No. 5,583,019, issued to Barclay. All of the above disclosed patents are incorporated herein by reference in their entirety.

For the sake of brevity, however, this detailed description of the invention is presented for purposes of convenience and illustration for the case of extracting lipids

comprising omega-3 highly unsaturated fatty acid from microorganisms producing the same, in particular extracting lipids from microorganisms that produce a relatively high amount of DHA. It is to be understood, however, that the invention as a whole is not intended to be so limited, and that one skilled in the art will recognize that the concept of the present invention will be applicable to other microorganisms producing a variety of lipid compositions in accordance with the techniques discussed herein. These microorganisms include microorganisms, such as fungi, protists, algae and bacteria, which produce a variety of lipids, such as phospholipids; free fatty acids; esters of fatty acids, including triglycerides of fatty acids; sterols; pigments (*e.g.*, carotenoids and oxycarotenoids) and other lipids, and lipid associated compounds such as phytosterols, ergothionine, lipoic acid and antioxidants including beta-carotene, tocotrienols, and tocopherol. Preferred lipids and lipid associated compounds include, but are not limited to, cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof. For the sake of brevity, unless otherwise stated, the term "lipid" refers to lipid and/or lipid associated compounds. Other lipids and microorganisms which may be suitable for use in the instant invention will be readily apparent to those skilled in the art.

Typical microbial lipid (in particular an oil containing an omega-3 highly unsaturated fatty acid such as DHA) manufacturing processes involve growing microorganisms which produce DHA in a fermentor, isolating the microorganisms, drying the microbial biomass and extracting the intracellular lipids with a non-polar organic solvent, *e.g.*, hexane. The extracted lipid is generally further refined to produce a high purity and/or quality lipid. The isolation of microorganisms involves diluting the fermentation broth with water and centrifuging the mixture to isolate microorganisms. When lipids are not extracted immediately or soon after isolating the microorganisms, the isolated microorganisms are typically dried, *for example*, on a drum dryer, and sealed in a package, *e.g.*, in vacuum-sealed bags, to prevent degradation of lipids. Unfortunately, the drying process exposes the microorganisms to heat, which can damage, *i.e.*, degrade the quality of, the lipid if done incorrectly. The package may develop leaks, which can further degrade the quality of the lipids. Furthermore, if the dried microorganisms are not

treated with an antioxidant, the exposure of microorganisms to air and/or light can further degrade the lipids.

Recovering the crude oil directly from the fermentation broth avoids these problems. Avoiding the non-polar organic solvent extraction step reduces manufacturing costs and also eliminates operator exposure to the dried microorganisms, which can cause an allergic response in some individuals.

The present invention provides a method for obtaining lipids from microorganisms using a substantially nonpolar organic solvent free extraction process, *i.e.*, a "solventless" extraction process. The term "solventless extraction process" refers to an extraction process which, when an aqueous or polar solvent is used, the aqueous or polar solvent includes less than about 5% of a nonpolar organic solvent, preferably less than about 4%, more preferably less than about 2%, and most preferably less than 1%. However, solvents can be employed in downstream steps such as in a refining process. The process of the present invention can include obtaining or isolating microorganisms, preferably from a fermentation process. In contrast to the prior art processes such as the extraction of oils from soybeans in which the soybeans must be dried, the process of the present invention does not require a drying step prior to the extraction process. Thus, processes of the present invention are applicable to extracting lipids from a microbial biomass containing at least about 10% by weight entrained water, preferably at least about 20%, more preferably at least about 30%, and most preferably at least about 50%. When the microorganisms are obtained from a fermentation process, the process of the present invention can include adding a base to the fermentation broth to dissolve any proteinaceous compound that may be present in the broth. "Bases" are substances which show alkali (basic) reactions in watery solutions, i.e. they attach protons and dissociate hydroxide ions. The base should be strong enough to hydrolyze or solubilize at least a portion of proteinaceous compounds that may be present in the broth. Bases which are useful for solubilizing proteins are well known to one of ordinary skill in the art of chemistry. Exemplary bases which are useful in the processes of the present invention include, but are not limited to, hydroxides, carbonates and bicarbonates of lithium, sodium, potassium, calcium, and magnesium carbonate. Other very basic compounds like basic phosphate salts, such as trisodium phosphate, can also be used.

The process of the present invention can also include rupturing or lysing the cells of microorganisms to release the lipids which are present within the cells. Cells can be lysed using any of the known methods including chemical; thermal; mechanical,

including, but not limited to, french press, mills, ultrasonication, homogenization, and steam explosion; and combinations thereof. In a thermal lysing of cells, the fermentation broth containing microorganisms are heated until cells, *i.e.*, cell walls, of microorganisms degrade or breakdown. Typically, the fermentation broth is heated to a temperature of at least about 50°C, preferably at least about 75°C, more preferably to at least about 100°C, and most preferably to at least about 130°C. An important aspect of the process is to maintain the temperature below that temperature at which the extracted lipids can be degraded. Thermally lysing the cell walls of microorganisms is particularly useful for microorganisms whose cell walls are composed of proteins. During this process the headspace of the fermentor can be filled with nitrogen or another inert gas to prevent oxidation of the lipids by oxygen.

Heating the broth also denatures proteins and helps solubilize organic materials, including proteins. Heating of the fermentation broth step can be achieved by any of the known methods, including the use of an in-line heat exchanger, and preferably by sparging steam into the fermentation broth and maintaining the broth at a desired temperature for less than about 90 minutes, preferably less than about 60 minutes, and more preferably less than about 30 minutes.

The solventless extraction process of the present invention can also include at least partially separating the spent fermentation broth from the lipids. Typically, this is achieved by centrifuging, *e.g.*, by passing the broth through a stacked-disc, separator or decantor centrifuge, and collecting lipids as an emulsion phase. Centrifuging the mixture results in a two phase mixture comprising a heavy layer and a light layer. Typically, the heavy layer is an aqueous phase, which contains the majority of cellular debris. The light layer which contains emulsified lipids is then diluted with water, again separated into two phase mixture and the light layer is again isolated. This dilution with water, separation and isolation processes (*i.e.*, washing process) can be achieved continuously by feeding water and removing the heavy layer throughout the process or it can be conducted in discreet steps. The washing process is generally repeated until a substantially non-emulsified lipid layer is obtained, although minor amounts of emulsion can remain. It is believed that the oil-water interface of the emulsion is stabilized by residual cellular debris which is removed by the washing process. During the washing process, the successive amount of water added is reduced to increase the lipid content. While reducing the amount of feed water too quickly can result in loss of lipids to the aqueous phase, reducing the amount of feed water too slowly results in an inefficient washing

process. One can readily determine an appropriate rate of feed water reduction by observing or analyzing the separated aqueous layer. Generally, the lipid layer, *i.e.*, the light layer, is colored; therefore, in many cases one can determine an appropriate rate of feed water reduction by simply analyzing or observing the color of the aqueous layer which is separated from the lipid layer.

Alternatively, and preferably, the emulsion can be broken, and the oil recovered using the deoiling process outlined in WO 96/05278 which is incorporated herein by reference in its entirety. In this process a water soluble compound, e.g., alcohol and/or acetone, is added to the oil/water emulsion to break the emulsion and the resulting mixture is separated by centrifugation. The isolated lipid can be further refined using a process similar to that used to refine standard vegetable oils. Briefly, the lipid refining process generally involves hydrating phospholipids by adding phosphoric acid to the lipid followed by adding sodium hydroxide to neutralize free fatty acids. These compounds are removed via centrifugation. This is then followed by a water wash step to further remove any remaining amounts of hydrated phospholipids ("gums") and neutralized fatty acids ("soapstock") in the lipid. The resulting lipid is bleached using Trysil™ and a standard bleaching clay. Citric acid is also added to remove divalent metal ions by chelation. The Trysil™ and bleaching clay are then removed via filtration to produce refined lipid. The bleached lipid can be cold filtered to remove high melting point compounds that may be present in the lipid; however, this step is generally seldom required.

The resulting lipid can be further refined by removing any low molecular weight components that may be present. Typically, these components are removed by sparging with steam at high temperatures, under high vacuum. This process also destroys any peroxide bonds which may be present and reduces or removes off- odors and helps improve the stability of the oil. An antioxidant may then be added to the resulting deodorized lipid to improve product stability.

During the refining process, the isolated lipid can be winterized to remove high melting compounds, such as saturated fatty acids. The winterization process generally involves dissolving the isolated lipid in an organic solvent, *e.g.*, hexane, cooling the resulting organic solution, and filtering the solution to remove the high melting point components of the lipid or stearine phase. The winterization process generally produces a clear lipid, especially when the isolated lipid is cloudy or opaque. As will be appreciated, the use of a solvent such as hexane is acceptable in processes such as the above described

"refining" process. Alternatively, the isolated lipid can be chilled and solidified impurities can be filtered out, without employing a solvent.

The refining, bleaching, deodorizing process outlined above would be used for triglyceride-rich lipid mixtures. Alternatively, or in addition to this process, other lipids, for example, pigments or carotenoids can be separated and purified, e.g., by partition into various solvents, chromatographic methods, etc.

While, the process of the present invention can include isolating microorganisms from a fermentation process, one of the advantages of the present invention is that it allows fermentation of microorganisms and isolation of lipids to be carried out in a single vessel. For example, after the fermentation, one can add base to the fermentation vessel and heat the mixture to lyse cells. After separating the phase into a heavy layer and a light layer, the light layer can be transferred to another vessel for further processing or the heavy layer can be removed from the fermentation vessel, for example, by draining through the bottom of the fermentation vessel, and the remaining light layer can be further processed within the same fermentation vessel.

If the concentration of lipids in the cells of the microbial culture is high (e.g., greater than about 20%) but the concentration of cells is low (e.g., less than about 40 g/L), as in cells grown in continuous fermentation systems, or cultures of difficult (e.g., fragile) to grow cells, or cultures produced in photosynthetically-based culture systems, the cells can be concentrated, e.g., by centrifugation, filtration, or settling, prior to employing the methods of the invention if necessary.

Additional objects, advantages, and novel features of this invention will become apparent to those skilled in the art upon examination of the following examples thereof, which are not intended to be limiting.

Examples

Process reproducibility was characterized by producing three samples of fully refined oil using crude oil from the new solventless extraction process. A hexane-extracted sample was also fully refined to serve as a control. The fermentation, extraction and oil isolation steps were performed at a large scale, while the oil refining studies were performed at a small scale.

The fully refined oil samples were analyzed to demonstrate process reproducibility.

Fermentation:

An oil-rich microorganism *(Schizochytrium sp.)* was grown in a 1200 gallon fermentor to produce a fermentation broth for the following extraction processes. A single batch was used to generate the starting broth for the three solventless extraction processes. The fermentation was allowed to run for 94 hours, while controlling the glucose levels at 13 g/L, after which time the corn syrup feed was terminated. Residual glucose levels dropped to <5 g/L four hours later. This resulted in a final age of 98 hours. The final broth volume was 958 gallons. The final yield was 146 g/L dry weight of cells. Both in-process contamination checks and a thorough analysis of a final broth sample failed to show any signs of contamination.

Hexane-Extracted Control Sample:

A small aliquot of broth from the fermentation batch was drum-dried and extracted with hexane to serve as a control sample. The biomass intermediate was recovered using a double-drum dryer. Analysis of this lipid is shown in Table 1.

Table 1. Analysis of drum dried *Schizochytrium* sp. biomass.

Parameter	Value
DHA Content (FAME basis)	35.7%
Oil Content	62.7%
Peroxide Value (meq/kg)	2.6
Total Plate Count (cfu/g)	<50
DHA Content*	20.3%
FAME Content	56.9%

* cellular dry weight basis

Solventless Extraction Process:

Crude oil was obtained by treating three 400-gallon aliquots (approx.) of the fermentation broth. Each 400-gallon aliquot from the fermentor was processed separately, starting with the caustic/heat treatment steps. Each aliquot was treated with 20 grams of 45% KOH per liter and heated to 130°C for about 30 minutes by passing steam through the fermentation broth. The crude oil was recovered from the treated broth using a commercial-scale Westfalia HFA-100 stacked-disc centrifuge. Summary results for various process parameters are reported in Table 2, and the final crude oil analysis results are shown in Table 3.

Table 2. Process Data from the Solventless Extraction Process.

	SFE-1	SFE-2	SFE-3
Broth Treatment			
Volume of Broth Processed	288 gal	288 gal	258 gal
Final Treated pH	7.5	8.0	8.7
Final Volume After Heat Treatment	388 gal	398 gal	308 gal
Volume Increase From Condensate	34.7%	38.2%	19.4%
1st Pass Emulsion			
Total Volume (gal)	180	133	149
Est. Oil Concentration (w/w)	12.0%	24.5%	16.1%
Apparent Density (g/mL)	0.986	0.991	0.999
Oil Isolation			
Total Crude Oil Recovered (lb)	182	165	174
DHA Oil Lot Number Assigned	SF1A	SF2A	SF3A

Table 3. Analysis of Lots of DHA oil from the Solventless Extraction Process.

Parameter	SF1A	SF2A	SF3A
DHA Content (%FAME)	39.0%	38.6%	39.2%
Peroxide Value (meq/kg)	4.6	1.8	2.0
Acid Value (mg KOH/g)	N/D	N/D	N/D
Moisture Content	N/D	N/D	N/D

Refining:

A sample from each aliquot of crude oil was winterized, refined, bleached and deodorized at a small scale, as was a sample of the crude oil from the hexane-extracted control. Miscellaneous process data from these small scale experiments is shown in Table 4, including recovery efficiencies for the various processing steps. While it is difficult to read too much into recovery efficiencies for bench-scale processes, as losses tend to be disproportionately large, the values listed in Table 4 show that values for the solventless-extracted samples tend to bracket the values measured for the hexane-extracted control, with the one exception being the winterization step. While the recovery efficiency during the winterization step for the hexane control was lower than those observed for the other three samples, this difference is insignificant from a statistical perspective. The high losses during the winterization step caused the overall recovery efficiency for the hexane-control sample to be lower as well. The lower yield would not be expected to have a significant impact on the overall quality of the oil. All in all, differences in the processing of the various oil samples were minimal.

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Table 4. Miscellaneous Process Data from the Oil Refining Steps.

	HEX-1	SF1A	SF2A	SF3A
Processing Conditions				
Miscella Concentration	45.0%	52.9%	52.8%	45.0%
Steam Sparge Rate	3.4%	3.4%	2.5%	2.2%
Recovery Efficiencies				
Winterization	80.6%	92.3%	87.7%	85.5%
Refining	89.4%	84.8%	91.8%	95.0%
Water Wash	90.6%	94.5%	95.8%	81.2%
Bleaching	86.1%	89.2%	87.3%	84.1%
Deodorization	97.4%	96.1%	97.2%	97.5%
Packaging	88.2%	89.7%	89.3%	95.8%
Overall	**48.2%**	**56.9%**	**58.5%**	**51.8%**

Fully refined oil samples from the three solventless extraction runs, and the hexane-extracted control, were analyzed and the results are shown in Table 5. Also shown are the corresponding release specifications for each parameter.

A sample of the starting crude oil from the solventless extraction run was also analyzed for iron content. The iron content of this sample was 0.08 ppm. The concentrations of the other trace metals were all below their respective detection limits.

Table 5. QC Results for RBD DHA Oil from the Solventless Extraction Process compared to hexane extracted oil.

	Hexane	Solventless Extrac. Process		
Run ID #	HEX-1	SFA1	SFA2	SFA3
Peroxide Value (meq/kg)	0.28	0.69	0.35	0.34
Acid Value (mg KOH/g)	0.17	0.11	0.57	0.24
Moisture & Volatiles	0.00%	0.06%**	0.00%	0.00%
Trace Metals (ppm)				
Lead	<0.20	<0.20	<0.20	<0.20
Arsenic	<0.20	<0.20	<0.20	<0.20
Iron	0.22	0.21	0.56***	0.02
Copper	<0.05	<0.05	<0.05	<0.05
Mercury	<0.20	<0.20	<0.20	<0.20
DHA (%FAME)	36.9	37.3	37.0	37.7
DHA (mg/g oil)	342	345	343	351
Hexane (ppm)	<3	<3	<3	<3

* Value was reduced to 0.22 mg KOH/g after repeating the refining and bleaching steps

** Sample analyzed by the San Diego Fermentation Sciences Analytical Group.

*** Value was reduced to <0.02 ppm after repeating the refining and bleaching steps

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Shown in Table 6 is a more direct comparison of the average analysis results for the three samples from the solventless extraction process versus those for the hexane control.

Table 6. Comparison of Average Values.

	Hexane	Solventless Extraction			
Parameter	Control	Mean	Std Dev	CV	%Diff
Peroxide Value (meq/kg)	0.28	0.46	0.20	43.3%	64.3%
Acid Value (mg KOH/g)	0.17	0.19*	0.06	33.3%	11.2%
Moisture & Volatiles	0.00%	0.02%	0.03%	173%	ND
Trace Metals (ppm)					
Lead	<0.20	<0.20	N/A	N/A	0.0%
Arsenic	<0.20	<0.20	N/A	N/A	0.0%
Iron	0.22	0.26	0.27	104%	18.2%
Copper	<0.05	<0.05	N/A	N/A	0.0%
Mercury	<0.20	<0.20	N/A	N/A	0.0%
DHA Content (%FAME)	36.9%	37.3%	0.4%	0.9%	1.1%
DHA Content (mg/g)	342	346	4	1.2%	1.2%
Hexane (ppm)	<3	<3	N/A	N/A	0.0%

* Calculated using the acid value for the re-worked sample.

The results from this experiment clearly demonstrate that the solventless extraction process is both reproducible and lipids from solventless extraction are relatively indistinguishable from the lipids obtained from hexane extraction process in terms of process performance and product quality. The final product from the solventless extraction process is substantially equivalent to lipids from a current hexane-based extraction process, as determined by similarities between the fatty acid and sterol profiles of the product from these two processes.

The present invention, in various embodiments, includes components, methods, processes, systems and/or apparatus substantially as depicted and described herein, including various embodiments, subcombinations, and subsets thereof. Those of skill in the art will understand how to make and use the present invention after understanding the present disclosure. The present invention, in various embodiments, includes providing devices and processes in the absence of items not depicted and/or described herein or in various embodiments hereof, including in the absence of such items as may have been used in previous devices or processes, *e.g.*, for improving performance, achieving ease and/or reducing cost of implementation.

The foregoing discussion of the invention has been presented for purposes of illustration and description. The foregoing is not intended to limit the invention to the form or forms disclosed herein. Although the description of the invention has included description of one or more embodiments and certain variations and modifications, other variations and modifications are within the scope of the invention, *e.g.*, as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative embodiments to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

WHAT IS CLAIMED IS:

1. A process for obtaining lipid from microorganisms comprising:

(a) lysing cells of the microorganisms to produce a lysed cell mixture;

(b) treating said lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a light layer, wherein said heavy layer comprises an aqueous solution and said light layer comprises said lipid;

(c) separating said heavy layer from said light layer; and

(d) obtaining said lipid from said light layer.

2. The process of Claim 1, wherein said step (b) comprises centrifuging said lysed cell mixture.

3. The process of Claim 2, wherein said light layer comprises an emulsified lipid.

4. The process of Claim 3 further comprising:

(e) adding an aqueous extraction solution to said light layer of step (c); and

(f) repeating said steps (c), (d) and (e) until said lipid becomes substantially non-emulsified prior to said step (d).

5. The process of Claim 3, wherein said emulsified lipid comprises a suspension of said lipid in an aqueous solution.

6. The process of Claim 1, wherein said aqueous solution comprises solid cell materials.

7. The process of Claim 1, wherein said microorganisms are obtained from a fermentation process.

8. The process of Claim 7 further comprising adding a base to a fermentation broth.

9. The process of Claim 8, wherein said base is selected from the group consisting of hydroxides, carbonates, bicarbonates, phosphates and mixtures thereof.

10. The process of Claim 7 further comprising solubilizing at least part of proteinaceous compounds in a fermentation broth.

11. The process of Claim 1, wherein said step (a) comprises heating said microorganisms to temperature of at least about 50°C.

12. The process of Claim 1, wherein said microorganism is capable of growth at salinity level of less than about 12 g/L of sodium chloride.

13. The process of Claim 1, wherein said microorganism comprises at least about 20% by weight of lipid.

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14. The process of Claim 1, wherein said microorganism is selected from the group consisting of algae, fungi, bacteria and protists.

15. The process of Claim 14, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

16. The process of Claim 15, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

17. The process of Claim 16, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

18. The process of Claim 1, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

19. The process of Claim 1, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

20. A process for obtaining lipids from microorganisms comprising:

(a) growing said microorganisms in a fermentation medium to produce a fermentation broth;

(b) solubilizing at least a part of any proteins present in said fermentation broth;

(c) lysing cells of said microorganisms to produce a lysed cell mixture;

(d) treating said lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a light layer, wherein said heavy layer comprises an aqueous solution and said light layer comprises emulsified lipids;

(e) separating said heavy layer from said light layer; and

(f) obtaining said lipids from said light layer.

21. The process of Claim 20, wherein said step of dissolving proteins comprises contacting said fermentation broth with a base.

22. The process of Claim 21, wherein said base is selected from the group consisting of hydroxides, carbonate, bicarbonates, phosphates and mixtures thereof.

23. The process of Claim 20, wherein said step of lysing cells comprises heating said microorganisms to a temperature of at least about 50°C.

24. The process of Claim 20, wherein said step of producing the phase separated mixture comprises centrifuging said lysed cell mixture.

25. The process of Claim 20, wherein said step of obtaining said lipids from said light layer comprises:

(a) adding an aqueous washing solution to said light layer;

(b) separating said aqueous washing solution from said light layer; and

(c) repeating said steps (a) and (b) until said lipid becomes substantially non-emulsified.

26. The process of Claim 20, wherein said aqueous solution comprises solid cell materials.

27. The process of Claim 20, wherein said microorganism is capable of growth at salinity level of less than about 12 g/L of sodium chloride.

28. The process of Claim 20, wherein said microorganism comprises at least about 20% by weight of lipid.

29. The process of Claim 20, wherein said microorganism is selected from the group consisting of algae, fungi, bacteria and protists.

30. The process of Claim 29, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

31. The process of Claim 30, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

32. The process of Claim 31, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and

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ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

33. The process of Claim 20, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

34. The process of Claim 20, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

35. A process for obtaining lipids from microorganisms comprising:

(a) growing said microorganisms in a fermentation medium to produce a fermentation broth;

(b) contacting said fermentation broth with a base to dissolve at least a part of any proteins present in said fermentation broth;

(c) increasing the temperature of said fermentation broth to at least about 50°C to lyse cells of said microorganisms to produce a lysed cell mixture;

(d) separating substances of different densities from said lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a light layer, wherein said heavy layer comprises an aqueous solution and said light layer comprises emulsified lipids;

(e) removing said heavy layer from said phase separated mixture;

(f) adding an aqueous washing solution to said light layer;

(g) separating substances of different densities from said mixture of step (f);

(h) removing said heavy layer from said phase separated mixture; and

(i) repeating said steps (f)-(h) until said lipid becomes substantially non-emulsified.

36. The process of Claim 35, wherein said base is selected from the group consisting of hydroxides, carbonates, bicarbonates, and mixtures thereof.

37. The process of Claim 35, wherein said step of producing the phase separated mixture comprises centrifuging said lysed cell mixture.

38. The process of Claim 35, wherein said aqueous solution of step (d) comprises solid cell materials.

39. The process of Claim 35, wherein said microorganism is capable of growth at salinity level of less than about 12 g/L of sodium chloride..

40. The process of Claim 35, wherein said microorganism comprises at least about 20% by weight of lipid.

41. The process of Claim 35, wherein said microorganism is selected from the group consisting of algae, fungi, bacteria and protists.

42. The process of Claim 35, wherein said microorganisms comprise microorganisms from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles.

43. The process of Claim 35, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

44. The process of Claim 43, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

45. The process of Claim 35, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

46. The process of Claim 35, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-

6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

47. A process for obtaining lipids from microorganisms comprising:

(a) growing microorganisms in a culture medium;

(b) treating said culture medium and the microorganism cells to release intercellular lipids;

(c) subjecting the culture medium containing the released intercellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

48. The process of Claim 47 wherein said microorganisms are lipid-rich microorganisms.

49. The process of Claim 47 wherein said microorganisms are selected from the group consisting of algae, bacteria, fungi and protists.

50. The process of Claim 47 wherein said microorganisms are selected from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles.

51. The process of Claim 47, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

52. The process of Claim 51, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

53. The process of Claim 52, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

54. The process of Claim 47, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty

acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

55. The process of Claim 54, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

56. The process of Claim 47, wherein said treatment includes a treatment selected from the group consisting of heating said cells, exposing said cells to a basic compound, exposing said cells to a chelating compound or combinations thereof.

57. The process of Claim 47, wherein said treatment comprises heating the cells to at least 50°C before, during or after exposing the cells to a basic compound, a chelating compound or mixtures thereof.

58. The process of Claim 47, wherein said gravity separation of step (c) comprises passing the culture medium containing the released intercellular lipids through a stacked-disc, separator or decanter centrifuge.

59. The process of Claim 47, wherein the treatment of step to break the emulsion comprises mixing the emulsion with water, alcohol and/or acetone and subjecting the mixture to gravity separation.

60. The process of Claim 59, wherein said gravity separation comprises centrifugation.

61. The process of Claim 60, wherein said centrifugation includes treatment in a stacked-disc-, separator- or decanter-type centrifuge.

62. The process of Claim 59, wherein said treatment is repeated at least 3 times to obtain said crude lipid.

63. The process of Claim 47, wherein said crude lipid is subjected to further refining or processing to obtain a refined lipid.

64. The process of Claim 63, wherein said crude lipid is bleached and deodorized.

65. A process for recovering lipids from microorganisms comprising the steps:

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(a) growing said microorganisms in a culture medium;

(b) treating microorganism cells from said culture medium without drying said cells to release intercellular lipids;

(c) subjecting the culture medium containing the released intercellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

66. The process of Claim 65 wherein said microorganisms are lipid-rich microorganisms.

67. The process of Claim 65 wherein said microorganisms are selected from the group consisting of algae, bacteria, fungi and protists.

68. The process of Claim 65 wherein said microorganisms are selected from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles.

69. The process of Claim 65, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

70. The process of Claim 69, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

71. The process of Claim 70, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

72. The process of Claim 65, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

73. The process of Claim 72, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

74. The process of Claim 65, wherein said treatment of the cells includes a treatment selected from the group consisting of heating said cells, exposing said cells to basic conditions, exposing said cells to a chelating compound or combinations thereof.

75. The process of Claim 65, wherein said treatment of the cells comprises heating the cells to at least 50°C before, during or after exposing the cells to a basic condition, a chelating compound or mixtures thereof.

76. The process of Claim 65, wherein said gravity separation of step (c) comprises passing the culture medium containing the released intercellular lipids through a stacked-disc, separator or decanter centrifuge.

77. The process of Claim 65, wherein the treatment to break the emulsion comprises mixing the emulsion with water, alcohol and/or acetone and subjecting the mixture to gravity separation.

78. The process of Claim 77, wherein said gravity separation comprises centrifugation.

79. The process of Claim 78, wherein said centrifugation includes treatment in a stacked-disc-, separator- or decanter-type centrifuge.

80. The process of Claim 77, wherein said treatment is repeated at least 3 times to obtain said crude lipid.

81. The process of Claim 65, wherein said crude lipid is subjected to further refining or purification to obtain a refined lipid.

82. The process of Claim 81, wherein said crude lipid is bleached and deodorized.

83. A lipid made by the process of any one of claims 1-82.

84. A lipid derived from microorganisms with less than 0.2ppm residual nonpolar organic solvent.

85. A lipid comprising greater than 15% cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as

beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof with less than 0.2 ppm residual nonpolar organic solvent

86. A lipid comprising greater than 15% docosahexaenoic acid and less than 0.2 ppm residual nonpolar organic solvent.

PATENT COOPERATION TREATY

RECEIVED
SHERIDAN, ROSS

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: GARY J. CONNELL
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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing *(day/month/year)*	27 SEP 2002
Applicant's or agent's file reference: 2997-19-PCT	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority Date *(day/month/year)*
PCT/US01/01806	19 JANUARY 2001	19 JANUARY 2000

Applicant
OMEGATECH, INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US	Authorized officer
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Form PCT/IPEA/416 (July 1992)*

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2997-19-PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001	Priority date *(day/month/year)* 19 JANUARY 2000
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant OMEGATECH, INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets.

   [✓] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 26 sheets.

3. This report contains indications relating to the following items:

   I [X] Basis of the report

   II [ ] Priority

   III [ ] Non-establishment of report with regard to novelty, inventive step or industrial applicability

   IV [X] Lack of unity of invention

   V [X] Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   VI [ ] Certain documents cited

   VII [ ] Certain defects in the international application

   VIII [ ] Certain observations on the international application

Date of submission of the demand	Date of completion of this report
02 JULY 2001	05 SEPTEMBER 2002
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer Gayle Bridges for CHRISTOPHER TATE Telephone No. (703) 308-0196

Form PCT/IPEA/409 (cover sheet) (July 1998)*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/01806

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:
pages (See Attached) , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the claims:
pages (See Attached) , as originally filed
pages _____ , as amended (together with any statement) under Article 19
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the drawings:
pages (See Attached) , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the sequence listing part of the description:
pages (See Attached) , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the writen sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages NONE

☒ the claims, Nos. NONE

☒ the drawings, sheets/~~Fig~~ NONE

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

***Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

Form PCT/IPEA/409 (Box I) (July 1998) ★

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/01806

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- [ ] restricted the claims.
- [X] paid additional fees.
- [ ] paid additional fees under protest.
- [ ] neither restricted nor paid additional fees.

2. [ ] This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- [ ] complied with.
- [X] not complied with for the following reasons:

Please See Supplemental Sheet.

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- [X] all parts.
- [ ] the parts relating to claims Nos. .

Form PCT/IPEA/409 (Box IV) (July 1998)*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US01/01806

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	2-5, 8-86	YES
	Claims	1, 6, 7	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-86	NO
Industrial Applicability (IA)	Claims	1-86	YES
	Claims	NONE	NO

2. citations and explanations (Rule 70.7)

Claims 1, 6, and 7 lack novelty under PCT Article 33(2) as being anticipated by Gudin et al. (US 5,179,012).

Gudin et al. teaches a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7 (see, for example, column 2, line 37 - column 6, line 4).

Claims 1-86 lack an inventive step under PCT Article 33(3) as being obvious over Gudin et al. (US 5,179,012) in view of Tanaka et al. (WO 98/03671), Barclay (US 5,130,242), Best et al. (US 5,928,696), Wagner (US 4,720,456), and/or Kohn et al. (US 5,539,133).

Gudin et al. teach a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7.

The secondary references disclose other conventional steps/procedures used to beneficially obtain lipid (for example, liposoluble components)from microorganisms/cells (see, for example, Tanaka et al: column page 2, line 32 - page 11, line 23; Barclay: column 4, line 52 - column 13, line 49; Best et al: entire document; Wagner et al: column 1, lines 8-28; Kohn et al: column 1, line 10 - column 5, line 20) including those claimed.

It would have been obvious to one of ordinary skill in the art to incorporate other conventional art-recognized steps, such as those beneficially disclosed by the secondary references, within the process taught by Gudin so as to more effectively obtained high yields of desired lipid (liposoluble components) from such microorganisms, as well as to remove undesired solvents therefrom. Claimed limitations not expressly disclosed by the above teachings, including particular properties of such lipids, would be intrinsic thereto and/or obvious based upon the cited teachings as a whole.

---------- NEW CITATIONS ----------

NONE

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 11

and it considers that the International Application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated below:

The inventions listed as Groups I-IV do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The Group I process involves a step of lysing the microbial cells to produce a lysed cell mixture whereas the Group II process does not necessarily involve such a step. The special technical feature of the Group IV lipid is that it comprises greater than 15% cholesterol and/or other fatty acid, which is not shared by the lipid of Group III. Further, the lipids of Groups III and IV do not require that they be obtained using the special technical feature steps of the Group I process or of the Group II process.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

CLASSIFICATION:
The International Patent Classification (IPC) and/or the National classification are as listed below:
IPC(7): C12P 7/64, 1/04, 1/02; C12N 1/12; C12M 1/33, 3/08 and US Cl.: 435/134, 170, 171, 306.1, 946

I. BASIS OF REPORT:

This report has been drawn on the basis of the description,
page(s) NONE, as originally filed.
page(s) NONE, filed with the demand.
and additional amendments:
Pages 1 and 4-16, filed with the letter of 26 November 2001 and pages 2-3, filed with the letter of 06 May 2002.

This report has been drawn on the basis of the claims,
page(s) NONE, as originally filed.
page(s) NONE, as amended under Article 19.
page(s) NONE, filed with the demand.
and additional amendments:
Pages 17-21 and 26, filed with the letter of 26 November 2001 and pages 22-25, filed with the letter of 06 May 2002.

This report has been drawn on the basis of the drawings,
page(s) 1, as originally filed.
page(s) NONE, filed with the demand.
and additional amendments:
NONE

This report has been drawn on the basis of the sequence listing part of the description:
page(s) NONE, as originally filed.
pages(s) NONE, filed with the demand.
and additional amendments:
NONE

IV. LACK OF UNITY OF INVENTION:

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2, and 13.3 is not complied with for the following reasons:
As applicant was previously notified this International Preliminary Examining Authority has found plural inventions claimed in the International Application covered by the claims indicated below:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-46, drawn to a method of obtaining lipid from microorganisms comprising a step of lysing the microbial cells.

Group II, claim(s) 47-82, drawn to a method of obtaining lipid from microorganisms which does not necessarily comprise a step of lysing.

Group III, claim(s) 83-84, drawn to a lipid derived from a microorganism which has less than 0.2 ppm residual nonpolar organic solvent.

Group IV, claim(s) 85-86, drawn to a lipid comprising greater than 15% cholesterol and/or other fatty acids.

SOLVENTLESS EXTRACTION PROCESS

FIELD OF THE INVENTION

The present invention is directed to a process for extracting lipids from microorganisms without the use of any significant amount of a nonpolar organic solvent.

BACKGROUND OF THE INVENTION

A typical microorganism lipid manufacturing process, such as production of omega-3 highly unsaturated fatty acid, in particular, a lipid mixture rich in docosahexaenoic acid (DHA), involves growing microorganisms which are capable of producing the desired lipid in a fermentor, pond or bioreactor, isolating the microbial biomass, drying it, and extracting intracellular lipids with a nonpolar organic solvent, *e.g.*, hexane. Generally, intracellular lipids of microorganisms are extracted after rupturing (i.e., lysing) dried cells of the microorganisms. The extracted lipids are can be further refined to produce high purity and/or quality lipids. The microorganisms are generally isolated by first diluting the fermentation broth with water, and centrifuging the mixture to isolate microorganisms. The cells are then dried and if the lipids are not extracted immediately or soon thereafter, the cells are packaged, for example, in vacuum-sealed bags, to prevent degradation of lipids.

Unfortunately, the drying process exposes the microorganisms to heat, which can damage, *i.e.*, degrade the quality of, lipids if done incorrectly. The vacuum-sealed bags may develop leaks, which can further degrade the quality of the lipids due to exposure of the microorganisms to air. In addition, if the dried microorganisms are not treated with an antioxidant, lipids can be further degraded due to exposure to air and or light. For example, carotenoids, xanthophylls and long chain fatty acids like DHA may degrade due to oxidation by air and/or light. Furthermore, in some cases operators who are exposed to the dried microorganisms can develop an allergic reaction creating a safety and/or health hazard to operators.

Moreover, in an industrial scale production, the large amount of volatile and flammable nonpolar organic solvent used in lipid extraction can create hazardous operating conditions. The use of nonpolar organic solvent in the extraction process may necessitate using an explosion-proof oil recovery system, thereby adding to the cost of lipid recovery. Moreover, use of a nonpolar organic solvent in extracting lipids from

microorganisms generates a nonpolar organic solvent waste stream requiring a proper disposal method, which further increases the overall production cost of lipid extraction.

Therefore, there is a need for a process for extracting lipids from microorganisms which does not require the use of a nonpolar organic solvent. There is also a need for a lipid extraction process from microorganisms which does not require the expensive step of drying the microorganisms prior to extraction.

SUMMARY OF THE INVENTION

One embodiment of the present invention provides a process for obtaining lipid from microorganisms comprising:

(a) lysing cells of the microorganisms to produce a lysed cell mixture;

(b) treating the lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a lipid-rich light layer;

(c) separating the heavy layer from the lipid-rich light layer; and

(d) obtaining the lipid and/or lipid fractions from the light layer.

Another embodiment of the present invention provides a process for obtaining lipids from microorganisms comprising:

(a) growing microorganisms in a culture medium;

(b) treating said culture medium and the microorganism cells to release intracellular lipids;

(c) subjecting the culture medium containing the released intracellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

In accordance with another embodiment of the present invention, a process is provided for recovering lipids from microorganisms comprising the steps:

(a) growing said microorganisms in a culture medium;

(b) treating microorganism cells from said culture medium without drying said cells to release intracellular lipids;

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PEA/US 06 MAY 2002

(c) subjecting the culture medium containing the released intracellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

Preferably, the microorganisms are cultured in a fermentation medium in a fermentor. Alternatively, the microorganisms can be cultured photosynthetically in a photobioreactor or pond. Preferably, the microorganisms are lipid-rich microorganisms, more preferably, the microorganisms are selected from the group consisting of algae, bacteria, fungi and protists, more preferably, the microorganisms are selected from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles. Preferably, the microorganisms comprise microorganisms of the genus Mortierella, genus Crypthecodinium, and order Thraustochytriales, and more preferably, microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* or mixtures thereof, more preferably, the microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

The treatment of the cells includes a treatment to release the lipids such as lysing, rupturing or permeabilizing. As used herein, the terms lyse, lysing, lysed, etc., will be used generically to refer to a treatment to release intracellular lipids, including breaking or permeabilizing the cells. Preferably, the treatment is selected from the group consisting of heating the cells, exposing the cells to basic conditions, exposing the cells to a chelating compound or combinations thereof. More preferably the lysing or rupturing of the cells comprises heating the cells to at least 50°C while exposing the cells to basic conditions, a chelating compound or mixtures thereof.

Preferably, the gravity separation comprises passing the fermentation broth containing the released intracellular lipids through a centrifuge, such as stacked-disc-, separator- or decanter-type centrifuges.

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The separated lysed cell mixture comprises a heavy layer which comprises an aqueous solution which contains the solid materials resulting from the lysed cells, and a light layer which contains lipids. The light and heavy layers can be separated by centrifugation. The lipids may be present in an emulsified state. The light layer can be further washed with an aqueous washing solution until the lipid becomes substantially non-emulsified. Preferably the treatment to break the emulsion comprises mixing the emulsion with water, alcohol, acetone or mixtures thereof and subjecting the mixture to gravity separation. Preferably, the process is performed without using nonpolar organic solvents such as hexane.

When the lipid extraction process of the present invention includes using microorganisms from a fermentation process, the extraction process can also include solubilizing at least part of proteinaceous compounds in a fermentation broth by adding a base selected from the group consisting of hydroxides, carbonates, bicarbonates, phosphates and mixtures thereof.

The process of the present invention can also include heating the microorganisms to temperature of at least about 50 °C. Preferably, a chemical compound, such as a base, is added to the culture medium to aid in the lysing of the cells.

As an alternative to heating, the cells can be lysed with the assistance of a chelating compound such as EDTA. In addition to assisting in lysing or rupturing the cells, the chelators assist in preventing oxidation of the lipids during processing by chelating (binding with) free radical-producing metal ions in the fermentation broth such as iron or copper. Preferred forms of chelators are those that are considered food grade or GRAS (Generally Recognized As Safe). Effective chelating compounds include EDTA, citric acid or citrate, lactic acid, trisodium phosphate, polyphosphate, hexametaphosphate, EGTA, DTPA, phytic acid, or CDTA and other salt forms of these compounds. In one embodiment, sodium EDTA is added to the cells to degrade the cell walls by chelating the divalent cations which assist in holding the cell walls together. The process can be performed at higher temperatures with less EDTA or lower temperatures with higher concentrations of EDTA. For example, we have found that DHA-rich cells of *Schizochytrium* sp. can be permeabilized and/or ruptured by addition of EDTA to the cultures at the end of the fermentation process. A concentration of 10,000 ppm is required to assist in rupturing the cells at 30°C, a concentration of 5,000 ppm at 50°C and at temperatures above 70°C concentrations of lower than 1000 ppm are effective. Chelators can be added to the fermentation broth to make the cells easier to break by

physical processes such as homogenization. In addition to a chelator, water can also be added to increase the internal osmotic pressure in order to lyse the cells.

Preferably, the microorganisms are capable of growth at salinity level of less than about 12 g/L of sodium chloride, more preferably less than about 5 g/L of sodium chloride and most preferably less than about 3 g/L of sodium chloride. Preferably, the microorganisms are capable of growth at salinity levels of less than about 7 g/L of sodium and less than about 250 mg/L of chloride. Preferably, the chloride is present in an amount from about 70 to about 150 mg/L.

Preferably, the microorganisms comprise at least about 20% by weight of lipid, more preferably at least about 30% by weight, and most preferably at least about 40%. Alternatively at least about 20% of the lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof, preferably at least about 30%, and more preferably at least about 40%.

In one particular aspect of the present invention the microorganisms are capable of producing at least about 0.1 grams per liter per hour of a mixture of lipids, preferably including cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof, more preferably at least about 0.2 g/L/h, still more preferably at least about 0.3 g/L/h, and most preferably at least about 0.4 g/L/h.

In another aspect of the present invention, the microorganism is selected from the group consisting of algae, fungi, bacteria and protists. Preferably, the microorganisms are of the order Thraustochytriales. More preferably the microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof. And most preferably, the microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, mutant strains derived from any

of the foregoing, and mixtures thereof. Preferably, the microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888 and ATCC number 20889, and more preferably ATCC number 20888, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a flow diagram of one embodiment of a solventless extraction process of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a process for extracting, recovering, isolating or obtaining lipids from microorganisms. The process of the present invention is applicable to extracting a variety of lipids from a variety of microorganisms, for example, extracting lipids containing cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof, more preferably, omega-3 highly unsaturated fatty acids, such as docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and/or docosapentaenoic acid (DPA) (i.e., the omega-3 form of DPA), in particular lipids containing a relatively large amount of DHA, from microorganisms producing the same; and extracting lipids containing omega-6 highly unsaturated fatty acids, such as arachidonic acid and docosapentaenoic acid (DPA) (i.e., the omega-6 form of DPA)from microorganisms producing the same. Exemplary microorganisms which produce a relatively large amount of omega-3 highly unsaturated fatty acids are disclosed in commonly assigned U.S. Patent Nos. 5,340,594 and 5,340,742, both issued to Barclay, and exemplary microorganisms which produce a relatively large amount of arachidonic acid are disclosed in commonly assigned U.S. Patent No. 5,583,019, issued to Barclay. All of the above disclosed patents are incorporated herein by reference in their entirety.

For the sake of brevity, however, this detailed description of the invention is presented for purposes of convenience and illustration for the case of extracting lipids

comprising omega-3 highly unsaturated fatty acid from microorganisms producing the same, in particular extracting lipids from microorganisms that produce a relatively high amount of DHA. It is to be understood, however, that the invention as a whole is not intended to be so limited, and that one skilled in the art will recognize that the concept of the present invention will be applicable to other microorganisms producing a variety of lipid compositions in accordance with the techniques discussed herein. These microorganisms include microorganisms, such as fungi, protists, algae and bacteria, which produce a variety of lipids, such as phospholipids; free fatty acids; esters of fatty acids, including triglycerides of fatty acids; sterols; pigments (*e.g.*, carotenoids and oxycarotenoids) and other lipids, and lipid associated compounds such as phytosterols, ergothionine, lipoic acid and antioxidants including beta-carotene, tocotrienols, and tocopherol. Preferred lipids and lipid associated compounds include, but are not limited to, cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof. For the sake of brevity, unless otherwise stated, the term "lipid" refers to lipid and/or lipid associated compounds. Other lipids and microorganisms which may be suitable for use in the instant invention will be readily apparent to those skilled in the art.

Typical microbial lipid (in particular an oil containing an omega-3 highly unsaturated fatty acid such as DHA) manufacturing processes involve growing microorganisms which produce DHA in a fermentor, isolating the microorganisms, drying the microbial biomass and extracting the intracellular lipids with a non-polar organic solvent, *e.g.*, hexane. The extracted lipid is generally further refined to produce a high purity and/or quality lipid. The isolation of microorganisms involves diluting the fermentation broth with water and centrifuging the mixture to isolate microorganisms. When lipids are not extracted immediately or soon after isolating the microorganisms, the isolated microorganisms are typically dried, *for example*, on a drum dryer, and sealed in a package, *e.g.*, in vacuum-sealed bags, to prevent degradation of lipids. Unfortunately, the drying process exposes the microorganisms to heat, which can damage, *i.e.*, degrade the quality of, the lipid if done incorrectly. The package may develop leaks, which can further degrade the quality of the lipids. Furthermore, if the dried microorganisms are not

treated with an antioxidant, the exposure of microorganisms to air and/or light can further degrade the lipids.

Recovering the crude oil directly from the fermentation broth avoids these problems. Avoiding the non-polar organic solvent extraction step reduces manufacturing costs and also eliminates operator exposure to the dried microorganisms, which can cause an allergic response in some individuals.

The present invention provides a method for obtaining lipids from microorganisms using a substantially nonpolar organic solvent free extraction process, *i.e.*, a "solventless" extraction process. The term "solventless extraction process" refers to an extraction process which, when an aqueous or polar solvent is used, the aqueous or polar solvent includes less than about 5% of a nonpolar organic solvent, preferably less than about 4%, more preferably less than about 2%, and most preferably less than 1%. However, solvents can be employed in downstream steps such as in a refining process. The process of the present invention can include obtaining or isolating microorganisms, preferably from a fermentation process. In contrast to the prior art processes such as the extraction of oils from soybeans in which the soybeans must be dried, the process of the present invention does not require a drying step prior to the extraction process. Thus, processes of the present invention are applicable to extracting lipids from a microbial biomass containing at least about 10% by weight entrained water, preferably at least about 20%, more preferably at least about 30%, and most preferably at least about 50%. When the microorganisms are obtained from a fermentation process, the process of the present invention can include adding a base to the fermentation broth to dissolve any proteinaceous compound that may be present in the broth. "Bases" are substances which show alkali (basic) reactions in watery solutions, i.e. they attach protons and dissociate hydroxide ions. The base should be strong enough to hydrolyze or solubilize at least a portion of proteinaceous compounds that may be present in the broth. Bases which are useful for solubilizing proteins are well known to one of ordinary skill in the art of chemistry. Exemplary bases which are useful in the processes of the present invention include, but are not limited to, hydroxides, carbonates and bicarbonates of lithium, sodium, potassium, calcium, and magnesium carbonate. Other very basic compounds like basic phosphate salts, such as trisodium phosphate, can also be used.

The process of the present invention can also include rupturing or lysing the cells of microorganisms to release the lipids which are present within the cells. Cells can be lysed using any of the known methods including chemical; thermal; mechanical,

including, but not limited to, french press, mills, ultrasonication, homogenization, and steam explosion; and combinations thereof. In a thermal lysing of cells, the fermentation broth containing microorganisms are heated until cells, *i.e.*, cell walls, of microorganisms degrade or breakdown. Typically, the fermentation broth is heated to a temperature of at least about 50°C, preferably at least about 75°C, more preferably to at least about 100°C, and most preferably to at least about 130°C. An important aspect of the process is to maintain the temperature below that temperature at which the extracted lipids can be degraded. Thermally lysing the cell walls of microorganisms is particularly useful for microorganisms whose cell walls are composed of proteins. During this process the headspace of the fermentor can be filled with nitrogen or another inert gas to prevent oxidation of the lipids by oxygen.

Heating the broth also denatures proteins and helps solubilize organic materials, including proteins. Heating of the fermentation broth step can be achieved by any of the known methods, including the use of an in-line heat exchanger, and preferably by sparging steam into the fermentation broth and maintaining the broth at a desired temperature for less than about 90 minutes, preferably less than about 60 minutes, and more preferably less than about 30 minutes.

The solventless extraction process of the present invention can also include at least partially separating the spent fermentation broth from the lipids. Typically, this is achieved by centrifuging, *e.g.*, by passing the broth through a stacked-disc, separator or decantor centrifuge, and collecting lipids as an emulsion phase. Centrifuging the mixture results in a two phase mixture comprising a heavy layer and a light layer. Typically, the heavy layer is an aqueous phase, which contains the majority of cellular debris. The light layer which contains emulsified lipids is then diluted with water, again separated into two phase mixture and the light layer is again isolated. This dilution with water, separation and isolation processes (*i.e.*, washing process) can be achieved continuously by feeding water and removing the heavy layer throughout the process or it can be conducted in discreet steps. The washing process is generally repeated until a substantially non-emulsified lipid layer is obtained, although minor amounts of emulsion can remain. It is believed that the oil-water interface of the emulsion is stabilized by residual cellular debris which is removed by the washing process. During the washing process, the successive amount of water added is reduced to increase the lipid content. While reducing the amount of feed water too quickly can result in loss of lipids to the aqueous phase, reducing the amount of feed water too slowly results in an inefficient washing

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process. One can readily determine an appropriate rate of feed water reduction by observing or analyzing the separated aqueous layer. Generally, the lipid layer, *i.e.*, the light layer, is colored; therefore, in many cases one can determine an appropriate rate of feed water reduction by simply analyzing or observing the color of the aqueous layer which is separated from the lipid layer.

Alternatively, and preferably, the emulsion can be broken, and the oil recovered using the deoiling process outlined in WO 96/05278 which is incorporated herein by reference in its entirety. In this process a water soluble compound, e.g., alcohol and/or acetone, is added to the oil/water emulsion to break the emulsion and the resulting mixture is separated by centrifugation. The isolated lipid can be further refined using a process similar to that used to refine standard vegetable oils. Briefly, the lipid refining process generally involves hydrating phospholipids by adding phosphoric acid to the lipid followed by adding sodium hydroxide to neutralize free fatty acids. These compounds are removed via centrifugation. This is then followed by a water wash step to further remove any remaining amounts of hydrated phospholipids ("gums") and neutralized fatty acids ("soapstock") in the lipid. The resulting lipid is bleached using Trysil™ and a standard bleaching clay. Citric acid is also added to remove divalent metal ions by chelation. The Trysil™ and bleaching clay are then removed via filtration to produce refined lipid. The bleached lipid can be cold filtered to remove high melting point compounds that may be present in the lipid; however, this step is generally seldom required.

The resulting lipid can be further refined by removing any low molecular weight components that may be present. Typically, these components are removed by sparging with steam at high temperatures, under high vacuum. This process also destroys any peroxide bonds which may be present and reduces or removes off- odors and helps improve the stability of the oil. An antioxidant may then be added to the resulting deodorized lipid to improve product stability.

During the refining process, the isolated lipid can be winterized to remove high melting compounds, such as saturated fatty acids. The winterization process generally involves dissolving the isolated lipid in an organic solvent, *e.g.*, hexane, cooling the resulting organic solution, and filtering the solution to remove the high melting point components of the lipid or stearine phase. The winterization process generally produces a clear lipid, especially when the isolated lipid is cloudy or opaque. As will be appreciated, the use of a solvent such as hexane is acceptable in processes such as the above described

"refining" process. Alternatively, the isolated lipid can be chilled and solidified impurities can be filtered out, without employing a solvent.

The refining, bleaching, deodorizing process outlined above would be used for triglyceride-rich lipid mixtures. Alternatively, or in addition to this process, other lipids, for example, pigments or carotenoids can be separated and purified, e.g., by partition into various solvents, chromatographic methods, etc.

While, the process of the present invention can include isolating microorganisms from a fermentation process, one of the advantages of the present invention is that it allows fermentation of microorganisms and isolation of lipids to be carried out in a single vessel. For example, after the fermentation, one can add base to the fermentation vessel and heat the mixture to lyse cells. After separating the phase into a heavy layer and a light layer, the light layer can be transferred to another vessel for further processing or the heavy layer can be removed from the fermentation vessel, for example, by draining through the bottom of the fermentation vessel, and the remaining light layer can be further processed within the same fermentation vessel.

If the concentration of lipids in the cells of the microbial culture is high (e.g., greater than about 20%) but the concentration of cells is low (e.g., less than about 40 g/L), as in cells grown in continuous fermentation systems, or cultures of difficult (e.g., fragile) to grow cells, or cultures produced in photosynthetically-based culture systems, the cells can be concentrated, e.g., by centrifugation, filtration, or settling, prior to employing the methods of the invention if necessary.

Additional objects, advantages, and novel features of this invention will become apparent to those skilled in the art upon examination of the following examples thereof, which are not intended to be limiting.

Examples

Process reproducibility was characterized by producing three samples of fully refined oil using crude oil from the new solventless extraction process. A hexane-extracted sample was also fully refined to serve as a control. The fermentation, extraction and oil isolation steps were performed at a large scale, while the oil refining studies were performed at a small scale.

The fully refined oil samples were analyzed to demonstrate process reproducibility.

Fermentation:

An oil-rich microorganism *(Schizochytrium sp.)* was grown in a 1200 gallon fermentor to produce a fermentation broth for the following extraction processes. A single batch was used to generate the starting broth for the three solventless extraction processes. The fermentation was allowed to run for 94 hours, while controlling the glucose levels at 13 g/L, after which time the corn syrup feed was terminated. Residual glucose levels dropped to <5 g/L four hours later. This resulted in a final age of 98 hours. The final broth volume was 958 gallons. The final yield was 146 g/L dry weight of cells. Both in-process contamination checks and a thorough analysis of a final broth sample failed to show any signs of contamination.

Hexane-Extracted Control Sample:

A small aliquot of broth from the fermentation batch was drum-dried and extracted with hexane to serve as a control sample. The biomass intermediate was recovered using a double-drum dryer. Analysis of this lipid is shown in Table 1.

Table 1. Analysis of drum dried *Schizochytrium* sp. biomass.

Parameter	Value
DHA Content (FAME basis)	35.7%
Oil Content	62.7%
Peroxide Value (meq/kg)	2.6
Total Plate Count (cfu/g)	<50
DHA Content*	20.3%
FAME Content	56.9%

* cellular dry weight basis

Solventless Extraction Process:

Crude oil was obtained by treating three 400-gallon aliquots (approx.) of the fermentation broth. Each 400-gallon aliquot from the fermentor was processed separately, starting with the caustic/heat treatment steps. Each aliquot was treated with 20 grams of 45% KOH per liter and heated to 130°C for about 30 minutes by passing steam through the fermentation broth. The crude oil was recovered from the treated broth using a commercial-scale Westfalia HFA-100 stacked-disc centrifuge. Summary results for various process parameters are reported in Table 2, and the final crude oil analysis results are shown in Table 3.

Table 2. Process Data from the Solventless Extraction Process.

	SFE-1	SFE-2	SFE-3
Broth Treatment			
Volume of Broth Processed	288 gal	288 gal	258 gal
Final Treated pH	7.5	8.0	8.7
Final Volume After Heat Treatment	388 gal	398 gal	308 gal
Volume Increase From Condensate	34.7%	38.2%	19.4%
1st Pass Emulsion			
Total Volume (gal)	180	133	149
Est. Oil Concentration (w/w)	12.0%	24.5%	16.1%
Apparent Density (g/mL)	0.986	0.991	0.999
Oil Isolation			
Total Crude Oil Recovered (lb)	182	165	174
DHA Oil Lot Number Assigned	SF1A	SF2A	SF3A

Table 3. Analysis of Lots of DHA oil from the Solventless Extraction Process.

Parameter	SF1A	SF2A	SF3A
DHA Content (%FAME)	39.0%	38.6%	39.2%
Peroxide Value (meq/kg)	4.6	1.8	2.0
Acid Value (mg KOH/g)	N/D	N/D	N/D
Moisture Content	N/D	N/D	N/D

Refining:

A sample from each aliquot of crude oil was winterized, refined, bleached and deodorized at a small scale, as was a sample of the crude oil from the hexane-extracted control. Miscellaneous process data from these small scale experiments is shown in Table 4, including recovery efficiencies for the various processing steps. While it is difficult to read too much into recovery efficiencies for bench-scale processes, as losses tend to be disproportionately large, the values listed in Table 4 show that values for the solventless-extracted samples tend to bracket the values measured for the hexane-extracted control, with the one exception being the winterization step. While the recovery efficiency during the winterization step for the hexane control was lower than those observed for the other three samples, this difference is insignificant from a statistical perspective. The high losses during the winterization step caused the overall recovery efficiency for the hexane-control sample to be lower as well. The lower yield would not be expected to have a significant impact on the overall quality of the oil. All in all, differences in the processing of the various oil samples were minimal.

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Table 4. Miscellaneous Process Data from the Oil Refining Steps.

	HEX-1	SF1A	SF2A	SF3A
Processing Conditions				
Miscella Concentration	45.0%	52.9%	52.8%	45.0%
Steam Sparge Rate	3.4%	3.4%	2.5%	2.2%
Recovery Efficiencies				
Winterization	80.6%	92.3%	87.7%	85.5%
Refining	89.4%	84.8%	91.8%	95.0%
Water Wash	90.6%	94.5%	95.8%	81.2%
Bleaching	86.1%	89.2%	87.3%	84.1%
Deodorization	97.4%	96.1%	97.2%	97.5%
Packaging	88.2%	89.7%	89.3%	95.8%
Overall	**48.2%**	**56.9%**	**58.5%**	**51.8%**

Fully refined oil samples from the three solventless extraction runs, and the hexane-extracted control, were analyzed and the results are shown in Table 5. Also shown are the corresponding release specifications for each parameter.

A sample of the starting crude oil from the solventless extraction run was also analyzed for iron content. The iron content of this sample was 0.08 ppm. The concentrations of the other trace metals were all below their respective detection limits.

Table 5. QC Results for RBD DHA Oil from the Solventless Extraction Process compared to hexane extracted oil.

	Hexane	Solventless Extrac. Process		
Run ID #	HEX-1	SFA1	SFA2	SFA3
Peroxide Value (meq/kg)	0.28	0.69	0.35	0.34
Acid Value (mg KOH/g)	0.17	0.11	0.57	0.24
Moisture & Volatiles	0.00%	0.06%**	0.00%	0.00%
Trace Metals (ppm)				
Lead	<0.20	<0.20	<0.20	<0.20
Arsenic	<0.20	<0.20	<0.20	<0.20
Iron	0.22	0.21	0.56***	0.02
Copper	<0.05	<0.05	<0.05	<0.05
Mercury	<0.20	<0.20	<0.20	<0.20
DHA (%FAME)	36.9	37.3	37.0	37.7
DHA (mg/g oil)	342	345	343	351
Hexane (ppm)	<3	<3	<3	<3

* Value was reduced to 0.22 mg KOH/g after repeating the refining and bleaching steps

** Sample analyzed by the San Diego Fermentation Sciences Analytical Group.

*** Value was reduced to <0.02 ppm after repeating the refining and bleaching steps

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Shown in Table 6 is a more direct comparison of the average analysis results for the three samples from the solventless extraction process versus those for the hexane control.

Table 6. Comparison of Average Values.

	Hexane	Solventless Extraction			
Parameter	Control	Mean	Std Dev	CV	%Diff
Peroxide Value (meq/kg)	0.28	0.46	0.20	43.3%	64.3%
Acid Value (mg KOH/g)	0.17	0.19*	0.06	33.3%	11.2%
Moisture & Volatiles	0.00%	0.02%	0.03%	173%	ND
Trace Metals (ppm)					
Lead	<0.20	<0.20	N/A	N/A	0.0%
Arsenic	<0.20	<0.20	N/A	N/A	0.0%
Iron	0.22	0.26	0.27	104%	18.2%
Copper	<0.05	<0.05	N/A	N/A	0.0%
Mercury	<0.20	<0.20	N/A	N/A	0.0%
DHA Content (%FAME)	36.9%	37.3%	0.4%	0.9%	1.1%
DHA Content (mg/g)	342	346	4	1.2%	1.2%
Hexane (ppm)	<3	<3	N/A	N/A	0.0%

* Calculated using the acid value for the re-worked sample.

The results from this experiment clearly demonstrate that the solventless extraction process is both reproducible and lipids from solventless extraction are relatively indistinguishable from the lipids obtained from hexane extraction process in terms of process performance and product quality. The final product from the solventless extraction process is substantially equivalent to lipids from a current hexane-based extraction process, as determined by similarities between the fatty acid and sterol profiles of the product from these two processes.

The present invention, in various embodiments, includes components, methods, processes, systems and/or apparatus substantially as depicted and described herein, including various embodiments, subcombinations, and subsets thereof. Those of skill in the art will understand how to make and use the present invention after understanding the present disclosure. The present invention, in various embodiments, includes providing devices and processes in the absence of items not depicted and/or described herein or in various embodiments hereof, including in the absence of such items as may have been used in previous devices or processes, *e.g.*, for improving performance, achieving ease and/or reducing cost of implementation.

The foregoing discussion of the invention has been presented for purposes of illustration and description. The foregoing is not intended to limit the invention to the form or forms disclosed herein. Although the description of the invention has included description of one or more embodiments and certain variations and modifications, other variations and modifications are within the scope of the invention, *e.g.*, as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative embodiments to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

WHAT IS CLAIMED IS:

1. A process for obtaining lipid from microorganisms comprising:

(a) lysing cells of the microorganisms to produce a lysed cell mixture;

(b) treating said lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a light layer, wherein said heavy layer comprises an aqueous solution and said light layer comprises said lipid;

(c) separating said heavy layer from said light layer; and

(d) obtaining said lipid from said light layer.

2. The process of Claim 1, wherein said step (b) comprises centrifuging said lysed cell mixture.

3. The process of Claim 2, wherein said light layer comprises an emulsified lipid.

4. The process of Claim 3 further comprising:

(e) adding an aqueous extraction solution to said light layer of step (c); and

(f) repeating said steps (c), (d) and (e) until said lipid becomes substantially non-emulsified prior to said step (d).

5. The process of Claim 3, wherein said emulsified lipid comprises a suspension of said lipid in an aqueous solution.

6. The process of Claim 1, wherein said aqueous solution comprises solid cell materials.

7. The process of Claim 1, wherein said microorganisms are obtained from a fermentation process.

8. The process of Claim 7 further comprising adding a base to a fermentation broth.

9. The process of Claim 8, wherein said base is selected from the group consisting of hydroxides, carbonates, bicarbonates, phosphates and mixtures thereof.

10. The process of Claim 7 further comprising solubilizing at least part of proteinaceous compounds in a fermentation broth.

11. The process of Claim 1, wherein said step (a) comprises heating said microorganisms to temperature of at least about 50°C.

12. The process of Claim 1, wherein said microorganism is capable of growth at salinity level of less than about 12 g/L of sodium chloride.

13. The process of Claim 1, wherein said microorganism comprises at least about 20% by weight of lipid.

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14. The process of Claim 1, wherein said microorganism is selected from the group consisting of algae, fungi, bacteria and protists.

15. The process of Claim 14, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

16. The process of Claim 15, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

17. The process of Claim 16, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

18. The process of Claim 1, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

19. The process of Claim 1, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

20. A process for obtaining lipids from microorganisms comprising:

(a) growing said microorganisms in a fermentation medium to produce a fermentation broth;

(b) solubilizing at least a part of any proteins present in said fermentation broth;

(c) lysing cells of said microorganisms to produce a lysed cell mixture;

(d) treating said lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a light layer, wherein said heavy layer comprises an aqueous solution and said light layer comprises emulsified lipids;

(e) separating said heavy layer from said light layer; and

(f) obtaining said lipids from said light layer.

21. The process of Claim 20, wherein said step of dissolving proteins comprises contacting said fermentation broth with a base.

22. The process of Claim 21, wherein said base is selected from the group consisting of hydroxides, carbonate, bicarbonates, phosphates and mixtures thereof.

23. The process of Claim 20, wherein said step of lysing cells comprises heating said microorganisms to a temperature of at least about 50°C.

24. The process of Claim 20, wherein said step of producing the phase separated mixture comprises centrifuging said lysed cell mixture.

25. The process of Claim 20, wherein said step of obtaining said lipids from said light layer comprises:

(a) adding an aqueous washing solution to said light layer;

(b) separating said aqueous washing solution from said light layer; and

(c) repeating said steps (a) and (b) until said lipid becomes substantially non-emulsified.

26. The process of Claim 20, wherein said aqueous solution comprises solid cell materials.

27. The process of Claim 20, wherein said microorganism is capable of growth at salinity level of less than about 12 g/L of sodium chloride.

28. The process of Claim 20, wherein said microorganism comprises at least about 20% by weight of lipid.

29. The process of Claim 20, wherein said microorganism is selected from the group consisting of algae, fungi, bacteria and protists.

30. The process of Claim 29, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

31. The process of Claim 30, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

32. The process of Claim 31, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and

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ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

33. The process of Claim 20, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

34. The process of Claim 20, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

35. A process for obtaining lipids from microorganisms comprising:

(a) growing said microorganisms in a fermentation medium to produce a fermentation broth;

(b) contacting said fermentation broth with a base to dissolve at least a part of any proteins present in said fermentation broth;

(c) increasing the temperature of said fermentation broth to at least about 50°C to lyse cells of said microorganisms to produce a lysed cell mixture;

(d) separating substances of different densities from said lysed cell mixture to produce a phase separated mixture comprising a heavy layer and a light layer, wherein said heavy layer comprises an aqueous solution and said light layer comprises emulsified lipids;

(e) removing said heavy layer from said phase separated mixture;

(f) adding an aqueous washing solution to said light layer;

(g) separating substances of different densities from said mixture of step (f);

(h) removing said heavy layer from said phase separated mixture; and

(i) repeating said steps (f)-(h) until said lipid becomes substantially non-emulsified.

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36. The process of Claim 35, wherein said base is selected from the group consisting of hydroxides, carbonates, bicarbonates, and mixtures thereof.

37. The process of Claim 35, wherein said step of producing the phase separated mixture comprises centrifuging said lysed cell mixture.

38. The process of Claim 35, wherein said aqueous solution of step (d) comprises solid cell materials.

39. The process of Claim 35, wherein said microorganism is capable of growth at salinity level of less than about 12 g/L of sodium chloride.

40. The process of Claim 35, wherein said microorganism comprises at least about 20% by weight of lipid.

41. The process of Claim 35, wherein said microorganism is selected from the group consisting of algae, fungi, bacteria and protists.

42. The process of Claim 35, wherein said microorganisms comprise microorganisms from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles.

43. The process of Claim 35, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

44. The process of Claim 43, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

45. The process of Claim 35, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

46. The process of Claim 35, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-

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6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

47. A process for obtaining lipids from microorganisms comprising:

(a) growing microorganisms in a culture medium;

(b) treating said culture medium and the microorganism cells to release intracellular lipids;

(c) subjecting the culture medium containing the released intracellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

48. The process of Claim 47 wherein said microorganisms are lipid-rich microorganisms.

49. The process of Claim 47 wherein said microorganisms are selected from the group consisting of algae, bacteria, fungi and protists.

50. The process of Claim 47 wherein said microorganisms are selected from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles.

51. The process of Claim 47, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

52. The process of Claim 51, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

53. The process of Claim 52, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

54. The process of Claim 47, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty

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acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

55. The process of Claim 54, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

56. The process of Claim 47, wherein said treatment includes a treatment selected from the group consisting of heating said cells, exposing said cells to a basic compound, exposing said cells to a chelating compound or combinations thereof.

57. The process of Claim 47, wherein said treatment comprises heating the cells to at least 50°C before, during or after exposing the cells to a basic compound, a chelating compound or mixtures thereof.

58. The process of Claim 47, wherein said gravity separation of step (c) comprises passing the culture medium containing the released intracellular lipids through a stacked-disc, separator or decanter centrifuge.

59. The process of Claim 47, wherein the treatment of step to break the emulsion comprises mixing the emulsion with water, alcohol and/or acetone and subjecting the mixture to gravity separation.

60. The process of Claim 59, wherein said gravity separation comprises centrifugation.

61. The process of Claim 60, wherein said centrifugation includes treatment in a stacked-disc-, separator- or decanter-type centrifuge.

62. The process of Claim 59, wherein said treatment is repeated at least 3 times to obtain said crude lipid.

63. The process of Claim 47, wherein said crude lipid is subjected to further refining or processing to obtain a refined lipid.

64. The process of Claim 63, wherein said crude lipid is bleached and deodorized.

65. A process for recovering lipids from microorganisms comprising the steps:

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(a) growing said microorganisms in a culture medium;

(b) treating microorganism cells from said culture medium without drying said cells to release intracellular lipids;

(c) subjecting the culture medium containing the released intracellular lipids to gravity separation to form a light lipid-containing phase and a heavy phase;

(d) separating said light phase from said heavy phase;

(e) treating said light phase to break an emulsion formed between said lipid and water; and

(f) recovering a crude lipid.

66. The process of Claim 65 wherein said microorganisms are lipid-rich microorganisms.

67. The process of Claim 65 wherein said microorganisms are selected from the group consisting of algae, bacteria, fungi and protists.

68. The process of Claim 65 wherein said microorganisms are selected from the group consisting of golden algae, green algae, dinoflagellates, yeast, fungi of the genus *Mortierella*, and Stramenopiles.

69. The process of Claim 65, wherein said microorganisms comprise microorganisms of the order Thraustochytriales.

70. The process of Claim 69, wherein said microorganisms are selected from the genus *Thraustochytrium*, *Schizochytrium* and mixtures thereof.

71. The process of Claim 70, wherein said microorganisms are selected from the group consisting of microorganisms having the identifying characteristics of ATCC number 20888, ATCC number 20889, ATCC number 20890, ATCC number 20891 and ATCC number 20892, strains of *Mortierella schmuckeri*, strains of *Crypthecodinium cohnii*, mutant strains derived from any of the foregoing, and mixtures thereof.

72. The process of Claim 65, wherein said microorganisms are capable of producing at least about 0.1 grams per liter per hour of cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

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73. The process of Claim 72, wherein at least about 20% of said lipid is cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof.

74. The process of Claim 65, wherein said treatment of the cells includes a treatment selected from the group consisting of heating said cells, exposing said cells to basic conditions, exposing said cells to a chelating compound or combinations thereof.

75. The process of Claim 65, wherein said treatment of the cells comprises heating the cells to at least 50°C before, during or after exposing the cells to a basic condition, a chelating compound or mixtures thereof.

76. The process of Claim 65, wherein said gravity separation of step (c) comprises passing the culture medium containing the released intracellular lipids through a stacked-disc, separator or decanter centrifuge.

77. The process of Claim 65, wherein the treatment to break the emulsion comprises mixing the emulsion with water, alcohol and/or acetone and subjecting the mixture to gravity separation.

78. The process of Claim 77, wherein said gravity separation comprises centrifugation.

79. The process of Claim 78, wherein said centrifugation includes treatment in a stacked-disc-, separator- or decanter-type centrifuge.

80. The process of Claim 77, wherein said treatment is repeated at least 3 times to obtain said crude lipid.

81. The process of Claim 65, wherein said crude lipid is subjected to further refining or purification to obtain a refined lipid.

82. The process of Claim 81, wherein said crude lipid is bleached and deodorized.

83. A lipid made by the process of any one of claims 1-82.

84. A lipid derived from microorganisms with less than 0.2ppm residual nonpolar organic solvent.

85. A lipid comprising greater than 15% cholesterol, phytosterols, desmosterol, tocotrienols, tocopherols, ubiquinones, carotenoids and xanthophylls such as

beta-carotene, lutein, lycopene, astaxanthin, zeaxanthin, canthaxanthin, and fatty acids such as conjugated linoleic acids, and omega-3 and omega-6 highly unsaturated fatty acids such as eicosapentaenoic acid, docosapentaenoic acid, and docosahexaenoic acid, arachidonic acid, stearidonic acid, dihomogammalinolenic acid and gamma-linolenic acid or mixtures thereof with less than 0.2 ppm residual nonpolar organic solvent

86. A lipid comprising greater than 15% docosahexaenoic acid and less than 0.2 ppm residual nonpolar organic solvent.

Electronic Acknowledgement Receipt	
EFS ID:	33477003
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	21-AUG-2018
Filing Date:	01-JUN-2011
Time Stamp:	09:50:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah D.
Attorney Docket Number	28612-US-NP

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah D.
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	1672
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	Examiner Name	Carr, Deborah D.
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	Art Unit	1672
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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	Art Unit	1672
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That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2997-45-PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US03/14177	International filing date *(day/month/year)* 05 May 2003 (05.05.2003)	Priority date *(day/month/year)* 03 May 2002 (03.05.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): A61k 45/00, 47/44; C12N 15/88 and US Cl.: 424/283.1; 435/458		
Applicant MARKTEK BIOSCIENCES CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

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3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
20 November 2003 (20.11.2003)	08 January 2005 (08.01.2005)
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/14177

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed.

☒ the description:
pages 1-13 as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the claims:
pages 14-17 , as originally filed
pages NONE , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the drawings:
pages None , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages None

☒ the claims, Nos. None

☒ the drawings, sheets/~~fig~~ None

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*
*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

Form PCT/IPEA/409 (Box I) (July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/14177

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims	38-56	YES
	Claims	1-37	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-56	NO
Industrial Applicability (IA)	Claims	1-56	YES
	Claims	NONE	NO

2. CITATIONS AND EXPLANATIONS
Please See Continuation Sheet

Form PCT/IPEA/409 (Box V) (July 1998)

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims 6-35 and 42-56 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: the claims do not depend from a preceding claim in the alternative form only.

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claims 38, 42-47, and 49-55 objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims are indefinite for the following reason(s): the term "contacting" of claim 38 does not well define the meaning of "contacting" per se, therefore, the metes and bounds of the claims can not be determined.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Claims 1-37 lack novelty under PCT Article 33(2) as being anticipated by Bijl et al. (US Patent No. 6,255,505 B1).

Claims are drawn to a lipid comprising polyunsaturated fatty acid and product thereof and method of making a product thereof by adding the lipid.

Bijl et al teach a lipid comprising polyunsaturated fatty acid and product thereof and method of making a product thereof by adding the lipid. Note column 1, line 55 and column 2, lines 50-67. Also note col. 3, lines 55-56 and 64-68 and column 4, line 1, lines 29-35 and 40-45 and 64-65. Furthermore note column 5, lines 10-15 and 54-65 and column 6, lines 1-15. Also note column 7, lines 10-17 and column 7, lines 60-64, and col. 8, lines 1-20and 49-55. Further, note col. 9, lines 25-30, and 50-68 and col. 10, lines 6-10. In addition, note col. 22, lines 5-10 and Table 3, col. 23, lines 39-40 and col. 25-26, line 17 and the Table of col. 26 (note Example 22, specifically). Also note col. 27, line 59-63 and col. 28, all lines. Also see col. 29-30, all lines.

Claims are therefore, anticipated by the teachings of the reference.

Claims 1-56 lack an inventive step under PCT Article 33(3) as being obvious over Bijl et al (US Patent No. 6,255,505 B1), described above.

Claims are further drawn to method of obtaining a lipid as described above The method involves the contacting of the biomass with an enzyme which may be a lipase and protease.

Bijl et al also describe that the biomass may contain lipase and protease. Note col. 4, lines 40-45.

Although Bijl et al describe seeking to at least partially inactivate the enzymes of the broth, it is suggested that the presence of the enzymes is desired. Further, it is known and described that these enzymes are compound degrading substances. For example, lipase cleaves or breaks down lipids into smaller lipid compounds. Therefore, there is a lack of inventive step because the presence of these enzymes is known in a biomass useful for making the lipids and one of skill would have expected a successful result upon contacting the biomass with the enzymes for a process of obtaining the lipids. These claims lack an inventive step.

Claims 38-56 meet the criteria set out in PCT Article 33(2), because the prior art does not teach a process of obtaining a lipid from a biomass using the identical steps, thus, these claims are not anticipated but suggested by the reference.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Claims 1-56 meet the criteria set out in PCT Article 33(4), and thus possess industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 2997-45-1-PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2004/034965	International filing date *(day/month/year)* 22 October 2004 (22.10.2004)	Priority date *(day/month/year)*
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant MARTEK BIOSCIENCES CORPORATION		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☒	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 11 December 2007 (11.12.2007)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Dorothée Mülhausen e-mail: pt01.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	31 OCT 2007
Applicant's or agent's file reference 2997-45-1-P	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US04/34965	22 October 2004 (22.10.2004)	

International Patent Classification (IPC) or both national classification and IPC

IPC: C12P 7/64(2006.01)
USPC: 424/93.4;435/145,135,183

Applicant

MARTEK BIOSCIENCES CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	31 October 2007 (31.10.2007)	Irene Marx Telephone No. 571-272-0926

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Form PCT/ISA/237(Box No. I) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
   - ☐ paid additional fees
   - ☐ paid additional fees under protest and, where applicable, the protest fee
   - ☐ paid additional fees under protest but the applicable protest fee was not paid
   - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
   - ☐ complied with
   - ☒ not complied with for the following reasons:

   See the lack of unity section of the International Search Report(Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:
   - ☐ all parts.
   - ☒ the parts relating to claims Nos. 1-49

Form PCT/ISA/237 (Box No. IV) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 16-18,20,22-27,34-36,38-41,43-46	YES
	Claims 1-15,19,21,28-33,37,42,47-49	NO
Inventive step (IS)	Claims NONE	YES
	Claims 1-49	NO
Industrial applicability (IA)	Claims 1-49	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-15, 19, 21, 28-33, 37, 42, 47-49 lack novelty under PCT Article 33(2) as being anticipated by Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

Claims 1-49 lack an inventive step under PCT Article 33(3) as being obvious over Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

The reference differs from the claimed invention in the specific amounts recovered and in the further treatments included in the process. However, one of ordinary skill in this art would recognize that the specific amounts recovered depend largely on the specific microorganism providing the biomass and the specific culturing conditions used. In addition, the treatment of lipids with various agents, such as chelating agents, ion exchange resins and the use of refining techniques or old and well known in this art.

The process conditions discussed in the reference appears to be substantially the same as claimed. However, even if they are not, the adjustment of process conditions for optimization purposes identified as result-effective variables cited in the references would have been prima facie obvious to a person having ordinary skill in the art, since such adjustment is at the essence of biotechnical engineering.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process of Bijl *et al.* by using further well known techniques in the extraction, recovery and refining of the microbial oil for the expected benefit of maximizing the yield and providing a product suitable for human consumption.

Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

PATENT COOPERATION TREATY

RECEIVED
MAY 3 0 2001
SHERIDAN, ROSS

From the INTERNATIONAL SEARCHING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

Reviewed:
Date:
Initial:
Please return to Janice

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 2997-19-PCT	Date of Mailing (day/month/year) 22 MAY 2001 FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US01/01806	International filing date (day/month/year) 19 JANUARY 2001
Applicant OMEGATECH, INC.	

1. [X] The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER TATE TERRY J. DEY PARALEGAL SPECIALIST TECHNOLOGY CENTER 1600 Telephone No. (703) 308-0196

Form PCT/ISA/220 (July 1998) ★

(See notes on accompanying sheet)

BEST AVAILABLE COPY

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 2997-19-PCT	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001	(Earliest) Priority Date *(day/month/year)* 19 JANUARY 2000
Applicant OMEGATECH, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:
   [ ] contained in the international application in written form.
   [ ] filed together with the international application in computer readable form.
   [ ] furnished subsequently to this Authority in written form.
   [ ] furnished subsequently to this Authority in computer readable form.
   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has b een furnished.
2. [X] **Certain claims were found unsearchable** (See Box I).
3. [X] **Unity of invention is lacking** (See Box II).
4. With regard to the **title**,
   [X] the text is approved as submitted by the applicant.
   [ ] the text has been established by this Authority to read as follows:
5. With regard to the **abstract**,
   [X] the text is approved as submitted by the applicant.
   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the **drawings** to be published with the abstract is Figure No. ____
   [ ] as suggested by the applicant.
   [ ] because the applicant failed to suggest a figure.
   [ ] because this figure better characterizes the invention.
   [X] None of the figures.

Form PCT/ISA/210 (first sheet) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 83
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet(1)) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :C12P 7/64, 1/04, 1/02; C12N 1/12; C12M 1/33, 3/08
US CL :435/134, 170, 171, 306.1, 946
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/134, 170, 171, 306.1, 946

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST, BIOSIS, CAPLUS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,179,012 A (GUDIN et al) 12 January 1993, column 2, line 37 - column 6, line 4.	1, 6, 7
Y		2-5, 8-82, 84, 85
Y	WO 98/03671 A1 (NAGASE BIOCHEMICALS, LTD.), 29 January 1998, page 2, line 32 - page 11, line 23.	1-82, 84, 85
Y	US 5,130,242 A (BARCLAY) 14 July 1992, col 4, line 52 - col 13, line 49.	1-82, 84, 85
Y	US 5,928,696 A (BEST et al) 27 July 1999, see entire document.	1-82, 84, 85
Y	US 4,720,456 A (WAGNER et al) 19 January 1988, col 1, lines 7-28.	1-82, 84, 85

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 08 MARCH 2001	Date of mailing of the international search report 22 MAY 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER TATE TERRY J. DEY PARALEGAL SPECIALIST TECHNOLOGY CENTER 1600 Telephone No. (703) 3[illegible]

Form PCT/ISA/210 (second sheet) (July 1998) *

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	5,539,133 A (KOHN et al) 23 July 1996, see column 1, line 10 - column 5, line 20.	1-82, 84, 85

Form PCT/ISA/210 (continuation of second sheet) (July 1998) *

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01806

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-46, drawn to a method of obtaining lipid from microorganisms comprising a step of lysing the microbial cells.

Group II, claim(s) 47-82, 84-85, drawn to a method of obtaining lipid from microorganisms which does not necessarily comprise a step of lysing the microbial cells.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The Group I process involves a step of lysing the microbial cells to produce a lysed cell mixture whereas the Group II process does not necessarily involve such a step. Thus, the Group II process does not share this special technical feature.

UNITED STATES RECEIVING OFFICE (RO/US) FEE CODING AND RECORDING SHEET

☐ ADD'L SHEETS

IDENTIFICATION OF THE INTERNATIONAL APPLICATION

INTERNATIONAL APPLICATION NUMBER	INTERNATIONAL FILING DATE
PCT/US01/01806	19 JANUARY 2001

APPLICANT (Name)
OMEGATECH, INC.

	PAYMENTS						REFUNDS			
	Payment on Filing			Deposit Account		Deposit Account		To Deposit Account		To Deposit Account	
				19	1970						
Deposit Account				DATE: 08 MARCH 01		DATE:		DATE:		DATE:	
	☐ CASH/CHECK			☐ CASH/CHECK		☐ CASH/CHECK		☐ BY CHECK		☐ BY CHECK	
150				152	210						
151											
153											
800											
801											
802											
892											
		Total Paid:		Total Paid: 210		Total Paid:		Total Refunded:		Total Refunded:	
States Included for 892:				892:		892:					
States Included for 893:				893:		893:					

22 MAY 2001

Date Mailed:

RO/US Authorization	RO/US Authorization	RO/US Authorization	RO/US Authorization	RO/US Authorization
Jacqueline Moore				

PCT RO/102(b) (U.S. VERSION)
(Rev. 10-92)

U.S. DEPARTMENT OF COMMERCE — Patent & Trademark Office

CHAPTER I
PCT TELEPHONE MEMORANDUM
FOR
LACK OF UNITY OF INVENTION



PCT No.: PCT/US01/01806

Examiner: CHRISTOPHER TATE

Attorney spoken to: GARY CONNELL

Date of call: 08 MARCH 2001

☒ Amount of payment approved: 210.00

☒ Deposit account number to be charged: 19-1970

☒ Attorney elected to pay for ALL additional inventions

☐ Attorney elected to pay only for the additional inventions covered by

☐ Group(s):

-- encompassing --

☐ Claim(s):

☐ Attorney elected **NOT** to pay for any additional inventions, therefore, only the first claimed invention (Group I) covered by Claim(s) _ has been searched.

☒ Attorney was orally advised that there is no right to protest for any group not paid for.

☒ Attorney was orally advised that any protest must be filed no later than 15 days from the mailing of the Search Report (PCT/ISA/210).

Time Limit For Filing A Protest

Applicant is hereby given 15 days from the mailing date of this Search Report in which to file a protest of the holding of lack of unity of invention. In accordance with PCT Rule 40.2, applicant may protest the holding of lack of unity only with respect to the group(s) paid for.

Detailed Reasons For Holding Lack Of Unity Of Invention:

Detailed Reasons For Holding Lack of Unity Of Invention:
(Continued on a separate sheet)

Note: A copy of this form must be attached to the Search Report.

USPTO/299 (August 1998) B

ATTACHMENT TO CHAPTER I PCT TELEPHONE MEMORANDUM FOR LACK OF UNITY OF INVENTION

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-46, drawn to a method of obtaining lipid from microorganisms comprising a step of lysing the microbial cells.

Group II, claim(s) 47-82, 84-85, drawn to a method of obtaining lipid from microorganisms which does not necessarily comprise a step of lysing the microbial cells.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The Group I process involves a step of lysing the microbial cells to produce a lysed cell mixture whereas the Group II process does not necessarily involve such a step. Thus, the Group II process does not share this special technical feature.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

	Date of Mailing *(day/month/year)* 22 MAY 2001
Applicant's or agent's file reference 2997-19-PCT	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US01/01806	International filing date *(day/month/year)* 19 JANUARY 2001
Applicant OMEGATECH, INC.	

1. [X] The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CHRISTOPHER TATE TERRY J. DEY PARALEGAL SPECIALIST TECHNOLOGY CENTER 1600
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

Form PCT/ISA/220 (July 1998) ★ *(See notes on accompanying sheet)*

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- ☐ OTHER: _____

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PATENT COOPERATION TREATY

SAC/GJC

From the INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

RECEIVED
NOV 06 2007
SHERIDAN ROSS PC

PCT

COMMUNICATION IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE

Applicant's or agent's file reference 2997-45-1-P	Date of mailing (*day/month/year*) 31 OCT 2007 REPLY DUE See paragraph 1 below
International application No. PCT/US04/34965	International filing date (*day/month/year*) 22 October 2004 (22.10.2004)
Applicant MARTEK BIOSCIENCES CORPORATION	

1. ☐ REPLY DUE within _____ months/days from the above date of mailing

   ☒ NO REPLY DUE

2. COMMUNICATION:
The International Search Report and Written Opinion mailed on 26 September 2007 contains various errors including lack of indication for Box 6 of the cover sheet of the Search Report, the incorrect indication of a Y reference in box C of the Search Report, missing box IV of the Written Opinion and incorrect indication on Box V of the Written Opinion. A corrected copy is hereby attached. The response period for the International Search Report has been reset from the above Mailing Date.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Shian T. Luong Telephone No. 571-272-3700

Form PCT/ISA/224 (January 1994; reprint January 2004)

SAC / ADS

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

RECEIVED
OCT 0 1 2007
SHERIDAN, ROSS

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	26 SEP 2007
Applicant's or agent's file reference 2997-45-1-P	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US04/34965	22 October 2004 (22.10.2004)	

International Patent Classification (IPC) or both national classification and IPC

IPC: **C12P 7/64**(2006.01)
USPC: 424/93.4;435/145,135,183

Applicant

MARTEK BIOSCIENCES CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	17 August 2007 (17.08.2007)	Irene Marx Telephone No. (571) 272-0926

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 16-18, 20, 22-27, 34-36, 38-41, 43-46	YES
	Claims 1-15, 19, 21, 28-33, 37, 42, 47-49	NO
Inventive step (IS)	Claims 1-49	YES
	Claims NONE	NO
Industrial applicability (IA)	Claims 1-49	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-15, 19, 21, 28-33, 37, 42, 47-49 lack novelty under PCT Article 33(2) as being anticipated by Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

Claims 1-49 lack an inventive step under PCT Article 33(3) as being obvious over Bijl *et al.*.

The claims are directed to the recovery of polyunsaturated fatty acids from biomass, including microbial biomass.

Bijl *et al.* disclose the recovery of polyunsaturated fatty acids from biomass, including microbial biomass. See, e.g., col. 3 and 4.

The reference differs from the claimed invention in the specific amounts recovered and in the further treatments included in the process. However, one of ordinary skill in this art would recognize that the specific amounts recovered depend largely on the specific microorganism providing the biomass and the specific culturing conditions used. In addition, the treatment of lipids with various agents, such as chelating agents, ion exchange resins and the use of refining techniques or old and well known in this art.

The process conditions discussed in the reference appears to be substantially the same as claimed. However, even if they are not, the adjustment of process conditions for optimization purposes identified as result-effective variables cited in the references would have been prima facie obvious to a person having ordinary skill in the art, since such adjustment is at the essence of biotechnical engineering.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process of Bijl *et al.* by using further well known techniques in the extraction, recovery and refining of the microbial oil for the expected benefit of maximizing the yield and providing a product suitable for human consumption.

Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

Application No. Patent No.	Publication date *(day/month/year)*	Filing date *(day/month/year)*	Priority date (valid claim) *(day/month/year)*

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

Kind of non-written disclosure	Date of non-written disclosure *(day/month/year)*	Date of written disclosure referring to non-written disclosure *(day/month/year)*

Form PCT/ISA/237 (Box No. VI) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/34965

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

Form PCT/ISA/237 (Supplemental Box) (April 2005)

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

(i) the claim is unchanged;
(ii) the claim is cancelled;
(iii) the claim is new;
(iv) the claim replaces one or more claims as filed;
(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers, claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1*bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

PATENT COOPERATION TREATY

RECEIVED
SEP 2 8 2001
SHERIDAN, ROSS

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

Reviewed:
Date:
Initial:
Please return to Janice

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of Mailing *(day/month/year)*	25 SEP 2001
Applicant's or agent's file reference: 2997-19-PCT	REPLY DUE within TWO months from the above date of mailing

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US01/01806	19 JANUARY 2001	19 JANUARY 2000

International Patent Classification (IPC) or both national classification and IPC
Please See Supplemental Sheet.

Applicant
OMEGATECH, INC.

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I [X] Basis of the opinion
- II [ ] Priority
- III [X] Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV [X] Lack of unity of invention
- V [X] Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI [ ] Certain documents cited
- VII [ ] Certain defects in the international application
- VIII [ ] Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 *bis*.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 19 MAY 2002

Name and mailing address of the IPEA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	CHRISTOPHER TATE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

Form PCT/IPEA/408 (cover sheet) (July 1998) *

WRITTEN OPINION

International application No.
PCT/US01/01806

I. Basis of the opinion

1. With regard to the elements of the international application:*

[X] the international application as originally filed

[X] the description:
pages 1-16 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

[X] the claims:
pages 17-26 , as originally filed
pages NONE , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

[X] the drawings:
pages 1 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

[X] the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

[ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

[ ] the language of publication of the international application (under Rule 48.3(b)).

[ ] the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

[ ] contained in the international application in printed form.

[ ] filed together with the international application in computer readable form.

[ ] furnished subsequently to this Authority in written form.

[ ] furnished subsequently to this Authority in computer readable form.

[ ] The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

[ ] The statement that the information recorded in computer readable form is identical to the writen sequence listing has been furnished.

4. [X] The amendments have resulted in the cancellation of:

[X] the description, pages NONE

[X] the claims, Nos. NONE

[X] the drawings, sheets/~~fig~~ NONE

5. [ ] This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*

Form PCT/IPEA/408 (Box I) (July 1998)*

WRITTEN OPINION

International application No.
PCT/US01/01806

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application.

☒ claims Nos. 83

because:

☐ the said international application, or the said claim Nos. _ relate to the following subject matter which does not require international preliminary examination *(specify)*.

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 83 are so unclear that no meaningful opinion could be formed *(specify)*.

Claim 83 is an improper multiple dependent claim under PCT Rule 6.4(a).

☐ the claims, or said claims Nos. _ are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. _.

2. A written opinion cannot be drawn due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

WRITTEN OPINION

International application No.
PCT/US01/01806

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees the applicant has:

- ☐ restricted the claims. (See Supplemental Sheet)
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1 not to invite the applicant to restrict or pay additional fees:

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

Form PCT/IPEA/408 (Box IV) (July 1998)*

WRITTEN OPINION

International application No.
PCT/US01/01806

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	2-5, 8-82, 84, 85	YES
	Claims	1, 6, 7	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-82, 84, 85	NO
Industrial Applicability (IA)	Claims	1-82, 84, 85	YES
	Claims	NONE	NO

2. citations and explanations

Claims 1, 6, and 7 lack novelty under PCT Article 33(2) as being anticipated by Gudin et al. (US 5,179,012).

Gudin et al. teaches a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7 (see, for example, column 2, line 37 - column 6, line 4).

Claims 1-82, 84, and 85 lack an inventive step under PCT Article 33(3) as being obvious over Gudin et al. (US 5,179,012) in view of Tanaka et al. (WO 98/03671), Barclay (US 5,130,242), Best et al. (US 5,928,696), Wagner (US 4,720,456), and/or Kohn et al. (US 5,539,133).

Gudin et al. teach a method of obtaining lipid (liposoluble components) from microorganisms using the steps recited in claims 1, 6, and 7.

The secondary references disclose other conventional steps/procedures used to beneficially obtain lipid (for example, liposoluble components)from microorganisms/cells (see, for example, Tanaka et al: column page 2, line 32 - page 11, line 23; Barclay: column 4, line 52 - column 13, line 49; Best et al: entire document; Wagner et al: column 1, lines 8-28; Kohn et al: column 1, line 10 - column 5, line 20) including those claimed.

It would have been obvious to one of ordinary skill in the art to incorporate other onventional art-recognized steps, such as those beneficially disclosed by the secondary references, within the process taught by Gudin so as to more effectively obtained high yields of desired lipid (liposoluble components) from such microorganisms, as well as to remove undesired solvents therefrom. Claimed limitations not expressly disclosed by the above teachings, including particular properties of such lipids, would be intrinsic thereto and/or obvious based upon the cited teachings as a whole.

---------- NEW CITATIONS ----------
NONE

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:
IPC(7): C12P 7/64, 1/04, 1/02; C12N 1/12; C12M 1/33, 3/08 and US Cl.: 435/134, 170, 171, 306.1, 946

IV. LACK OF UNITY OF INVENTION:

1. This response is made to a telephone Lack of Unity requirement (see telephone memorandum attached hereto or attached to a prior Written Opinion).

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: GARY J. CONNELL
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202-5141

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of Mailing *(day/month/year)*	25 SEP 2001
Applicant's or agent's file reference: 2997-19-PCT	REPLY DUE within TWO months from the above date of mailing

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US01/01806	19 JANUARY 2001	19 JANUARY 2000

International Patent Classification (IPC) or both national classification and IPC
Please See Supplemental Sheet.

Applicant
OMEGATECH, INC.

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I [X] Basis of the opinion
- II [ ] Priority
- III [X] Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV [X] Lack of unity of invention
- V [X] Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI [ ] Certain documents cited
- VII [ ] Certain defects in the international application
- VIII [ ] Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension., see Rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 *bis*.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 19 MAY 2002

Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CHRISTOPHER TATE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

Form PCT/IPEA/408 (cover sheet) (July 1998) *

Electronic Acknowledgement Receipt	
EFS ID:	33478320
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	21-AUG-2018
Filing Date:	01-JUN-2011
Time Stamp:	10:30:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20180821_IDS_3_2nd_Submission.pdf	1058090 85919a161c330c93a447d9b6b583a0ec853eb7e8	no	21

Warnings:

Information:					
2	Non Patent Literature	WO2003092628-IPER_dated_February_21_2005.pdf	232701 0156ce15902cf12127df8589ea412b8643e22fa6	no	7
Warnings:					
Information:					
3	Non Patent Literature	WO2006046943_IPRP_dated_December_11_2007.pdf	217151 7cfed9d79af40fe292ac7829ee7fda39c9734415	no	5
Warnings:					
Information:					
4	Non Patent Literature	WO2001001806_ISR_dated_May_22_2001.pdf	402798 f1d7c3cf0b82fa99651fad54f0da5f88cdf5ef4e	no	11
Warnings:					
Information:					
5	Non Patent Literature	WO2006046943_Comm_dated_Oct_31_2007.pdf	43703 40d958a991f6b96a25c430d6dfad2104c0df39fd	no	1
Warnings:					
Information:					
6	Non Patent Literature	WO2006046943_WrittenOpinion_dated_Sept_26_2007.pdf	227322 331b4225a5fb80b7e271552c55f724684e188c4b	no	6
Warnings:					
Information:					
7	Non Patent Literature	WO2001001806_WrittenOpinion_dated_Sept_25_2001.pdf	247381 b73422e2f8c1bfbb54c64afc062e35f2eea99740	no	7
Warnings:					
Information:					
8	Non Patent Literature	Wynn_etal_1999.pdf	532416 7763b422f1e37c285ca4f040a8b5d252d2ff1b12	no	7
Warnings:					
Information:					

9	Non Patent Literature	Zhan_etal_1999.pdf	340112 8b558765669da293514a6aea5104dd6702cd0e1	no	7
Warnings:					
Information:					
10	Non Patent Literature	Zhang_etal_2011_pgs281-284.pdf	739594 25be6e20ce1e183d15a41a104cbed026661b222e	no	4
Warnings:					
Information:					
11	Non Patent Literature	Zhang_etal_1999_EF.pdf	371882 ad62428f9cb1ce8e4f29b7c057ce8f2c17c89655	no	5
Warnings:					
Information:					
12	Non Patent Literature	Zhang_etal_2011_pgs1934-1941.pdf	1008315 d58d505bbdbb1070d9aba414d16d0b202fa0e218	no	8
Warnings:					
Information:					
		Total Files Size (in bytes):	5421465		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CN102388988A	CN	A	2012-03-28	Oil Crops Research Inst Chinese Academy of Agricul		

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	LOWREY ET AL., Sequential Recycling of Enzymatic Lipid-Extracted Hydrolysate in Fermentations with a Thraustochytrid, Bioresource Technology, 2016, 333-342, 209	

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	13151014
Filing Date:	01-Jun-2011
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Attorney Docket Number:	28612-US-NP
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	33478765
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	Extraction of Lipid From Cells and Products Therefrom
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	21-AUG-2018
Filing Date:	01-JUN-2011
Time Stamp:	10:42:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	082118INTEFSW00006674506635
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20180820_IDS6_28612-US-NP.pdf	1042054 b4b626e73b0ffb065e9b95bbceecb4ed2b046efc	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	Lowrey_2016_333-342.pdf	1000527 a6f2faf328836be20e69d3de7f6ab2a8a215b5b0	no	10
Warnings:					
Information:					
3	Foreign Reference	CN102388988_MT_IEF.pdf	18326224 922440a85019768a1512b24ca82facb1cc1f30e9	no	21
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30829 b40515811 1baf93b0c4005286d498d3f40b76839	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	20399634		

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New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

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PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah D.
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	2753362		1956-07-03	Standard Brands Incorporated	
	2	3089821		1983-05-14	Merck & Co., Inc.	
	3	4504473		1985-03-12	Ribi ImmunoChem Research Inc.	
	4	4720456		1988-01-19	Wintershall AG	
	5	4792418		1988-12-20	Century Laboratories Inc.	
	6	5010004		2001-04-23	Agency of Industrial Science & Technology	Eng Equiv of JP01-98494
	7	5133963		1992-07-28	Shuntaro Ise	
	8	5179012		1993-01-12	Commissariat A L'Energie Atomique	Eng Equiv of JP4-211366

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	1672
	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

	9	5288619		1994-02-22	Kraft General Foods, Inc.	
	10	5338673		1994-08-16	Commissariat a L'Energie Atomique	
	11	5340742		1994-08-23	Omegatech, Inc.	
	12	5397591		1995-03-14	Martek Biosciences Corporation	
	13	5492938		1996-02-20	Martek Biosciences Corporation	
	14	5539133		1996-07-23	Milupa Aktiengesellschaft	
	15	5897994		1999-04-27	Nestec S.A.	
	16	5928696		1999-07-27	Dr. Frische GmbH	
	17	5969169		1999-10-19	Cargill Inc.	
	18	6127185		2000-10-03	University of Tennessee Research Corporation	
	19	6166231		2000-12-26	Martek Biosciences Corporation	

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	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

	20	6201145	B1	2001-03-13	Cargill Inc.	
	21	6204401	B1	2001-03-20	Norsk Hydro ASA	
	22	6255505	B1	2001-07-03	Gist-Brocades B.V.	
	23	6270828	B1	2001-08-07	Cargill Inc.	
	24	6528941	B1	2003-03-04	Mitsubishi Denki Kabushiki Kaisha	Eng Equiv of JP09-000284
	25	6541049	B2	2002-04-01	Martek Biosciences Coulder	
	26	6607900	B2	2003-08-19	Martek Biosciences Boulder	
	27	6750048	B2	2004-06-15	Martek Biosciences Corporation	Eng Equiv of JP2003520046
	28	6905861	B2	2005-06-14	Daicel Chemical Industries	Eng Equiv of JP200051684
	29	6958229	B2	2005-10-25	Suntory Limited	
	30	7351558	B2	2008-04-01	Martek Biosciences Corporation	Eng Equiv of JP2005278650

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Attorney Docket Number	28612-US-NP

	31	7431952	B2	2008-10-07	DSM IP Assets B.V.	Eng Equiv of JP2004504849
	32	7662598	B2	2010-02-16	Martek Biosciences Corporation	
	33	7781193	B2	2010-08-24	Martek Biosciences Corporation	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20070077341	A1	2007-04-05	Schlegel et al.	
	2	20080026103	A1	2008-01-31	Martek Biosciences Corp.	
	3	20080038800	A1	2008-02-14	Martek Biosciences Corp.	
	4	20080044875	A1	2008-02-21	Martek Biosciences Corp.	
	5	20090061067	A9	2009-03-05	Aker BioMarine, Inc.	
	6	20100227042	A1	2010-09-09	Danisco US Inc.	

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	Art Unit	1672
	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

	7	20100233761	A1	2010-09-16	Czartoski et al.	
	8	20110086386		2011-04-14	Czartoski et al.	
	9	20110252696	A1	2011-10-20	Solazyme Inc.	
	10	20110263709		2011-10-27	E. I. DuPont De Nemours and Company	
	11	20110295028		2011-12-01	Martek Biosciences Corporation	
	12	20120095246	A1	2012-04-19	DSM IP Assets B.V.	Eng Equiv of JP2007520213
	13	20120119862		2012-05-17	Solazyme, Inc.	
	14	20120130099		2012-05-24	Solazyme, Inc.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	DE2056896	DE		1971-08-26	VEB	Machine Translation	

EFS Web 2.1.17

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Attorney Docket Number:	28612-US-NP
Receipt Date:	21-AUG-2018
Filing Date:	01-JUN-2011
Time Stamp:	12:03:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20180821_IDS_3_2nd_Submission.pdf	1058090 85919a161c330c93a447d9b6b583a0ec853eb7e8	no	21

Warnings:

Information:					
2	Foreign Reference	KR19960014619.pdf	4027114 ab3859c3318fc726ac820622a422c128184bc00d	no	24
Warnings:					
Information:					
3	Foreign Reference	WO19970004121.pdf	437441 b49b29e8e03ccfdac68749c53ab4c89f8a7511d3	no	13
Warnings:					
Information:					
			Total Files Size (in bytes):	5522645	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

109143 7590 10/03/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER
CARR, DEBORAH D

ART UNIT	PAPER NUMBER
1671	

DATE MAILED: 10/03/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	01/03/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

109143 7590 10/03/2018
DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	01/03/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
CARR, DEBORAH D	1671	554-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 10/03/2018

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	PAPER NUMBER
1671	

DATE MAILED: 10/03/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/151,014	Applicant(s) Cherinko et al.	
	Examiner DEBORAH D CARR	Art Unit 1671	AIA Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the IDS filed 21 August 2018.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 52-58 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date See Continuation Sheet.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DEBORAH D CARR/
Primary Examiner, Art Unit 1671

Continuation of Attachment(s) 2. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 8/2018, 8/2018, 8/2018, 8/2018, 8/2018

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1671

CPC								
Symbol							**Type**	**Version**
C11B	/	1	/	10			F	2013-01-01
C11B	/	3	/	02			I	2013-01-01
C11B	/	3	/	16			I	2013-01-01
Y02E	/	50	/	16			A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner, Art Unit 1671	26 September 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20180926

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1671

INTERNATIONAL CLASSIFICATION					
CLAIMED					
C11B1/10	/	1	/	10	
C11B3/02	/	3	/	02	
C11B3/16	/	3	/	16	
C12P	/	7	/	64	
C11B	/	1	/	00	
A01H	/	5	/	10	
A23D	/	9	/	00	

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
554	8

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
435	134					
554	223	224	227			

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner, Art Unit 1671	26 September 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20180926

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1671

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		11		21		31		41		51		61		71
	2		12		22		32		42	1	52		62		72
	3		13		23		33		43	2	53		63		73
	4		14		24		34		44	3	54		64		74
	5		15		25		35		45	4	55		65		75
	6		16		26		36		46	5	56		66		76
	7		17		27		37		47	6	57		67		77
	8		18		28		38		48	7	58		68		78
	9		19		29		39		49		59		69		
	10		20		30		40		50		60		70		

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner, Art Unit 1671	26 September 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office Part of Paper No.: 20180926

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1671

CPC - Searched*		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	DDC
C11B3/02	9/2015, 1/2016, 7/2016, 9/2018	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018, 9/2018	DDC

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	ddc

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1671

Search Notes		
Search Notes	**Date**	**Examiner**
see transcript	8/2014, 9/2018	ddc
updated search	1/2015, 9/2018	ddc
updated search	9/2015, 9/2018	ddc
updated search	1/2016, 9/2018	ddc
updated search	7/2016, 9/2018	ddc
updated search	1/2017, 9/2018	ddc
updates search	2/2018, 9/2018	ddc
updated search	5/2018, 9/2018	
554/8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	ddc
435/134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	ddc
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	DDC
C11B3/02	9/2015, 1/2016, 7/2016, 9/2018	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018, 9/2018	DDC

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
435	134	8/2014, 2/2018, 5/2018, 9/2018	ddc
554	8, 223, 224, 227	8/2014, 2/2018, 5/2018, 9/2018	ddc
see areas searched		9/2015, 1/2016, 2/2018, 5/2018, 9/2018	ddc

/DEBORAH D CARR/ Primary Examiner.Art Unit 1671	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1671

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
	1	÷	=	=	=	=	✓	✓	✓	-
	2	÷	=	=	=	=	✓	-	-	-
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	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1671

CLAIM		DATE								
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(Not for submission under 37 CFR 1.99)

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Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah D.
Attorney Docket Number	28612-US-NP

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	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

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Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

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	1	LOWREY ET AL., Sequential Recycling of Enzymatic Lipid-Extracted Hydrolysate in Fermentations with a Thraustochytrid, Bioresource Technology, 2016, 333-342, 209	

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	9	5288619		1994-02-22	Kraft General Foods, Inc.	
	10	5338673		1994-08-16	Commissariat a L'Energie Atomique	
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Examiner Signature	/DEBORAH D CARR/	Date Considered	09/26/2018

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	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah D.
	Attorney Docket Number	28612-US-NP

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	2753362		1956-07-03	Standard Brands Incorporated	
	2	3089821		1983-05-14	Merck & Co., Inc.	
	3	4504473		1985-03-12	Ribi ImmunoChem Research Inc.	
	4	4720456		1988-01-19	Wintershall AG	
	5	4792418		1988-12-20	Century Laboratories Inc.	
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	7	5133963		1992-07-28	Shuntaro Ise	
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	9	5288619		1994-02-22	Kraft General Foods, Inc.	
	10	5338673		1994-08-16	Commissariat a L'Energie Atomique	
	11	5340742		1994-08-23	Omegatech, Inc.	
	12	5397591		1995-03-14	Martek Biosciences Corporation	
	13	5492938		1996-02-20	Martek Biosciences Corporation	
	14	5539133		1996-07-23	Milupa Aktiengesellschaft	
	15	5897994		1999-04-27	Nestec S.A.	
	16	5928696		1999-07-27	Dr. Frische GmbH	
	17	5969169		1999-10-19	Cargill Inc.	
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	19	6166231		2000-12-26	Martek Biosciences Corporation	

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	20	6201145	B1	2001-03-13	Cargill Inc.	
	21	6204401	B1	2001-03-20	Norsk Hydro ASA	
	22	6255505	B1	2001-07-03	Gist-Brocades B.V.	
	23	6270828	B1	2001-08-07	Cargill Inc.	
	24	6528941	B1	2003-03-04	Mitsubishi Denki Kabushiki Kaisha	Eng Equiv of JP09-000284
	25	6541049	B2	2002-04-01	Martek Biosciences Coulder	
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	27	6750048	B2	2004-06-15	Martek Biosciences Corporation	Eng Equiv of JP2003520046
	28	6905861	B2	2005-06-14	Daicel Chemical Industries	Eng Equiv of JP200051684
	29	6958229	B2	2005-10-25	Suntory Limited	
	30	7351558	B2	2008-04-01	Martek Biosciences Corporation	Eng Equiv of JP2005278650

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	31	7431952	B2	2008-10-07	DSM IP Assets B.V.	Eng Equiv of JP2004504849
	32	7662598	B2	2010-02-16	Martek Biosciences Corporation	
	33	7781193	B2	2010-08-24	Martek Biosciences Corporation	

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	1	20070077341	A1	2007-04-05	Schlegel et al.	
	2	20080026103	A1	2008-01-31	Martek Biosciences Corp.	
	3	20080038800	A1	2008-02-14	Martek Biosciences Corp.	
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	5	20090061067	A9	2009-03-05	Aker BioMarine, Inc.	
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	10	20110263709		2011-10-27	E. I. DuPont De Nemours and Company	
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	1	DE2056896	DE		1971-08-26	VEB	Machine Translation	

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	2	EP0246324	EP		1986-07-31	Director General of Agency of Industrial Science a	Eng Equiv of JP61-270397	
	3	EP0969086	EP		2000-01-05	Sagami Chemical Research Center		
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	12	JP08509355	JP		1998-03-17	Phycotech Inc.	Machine Translation	

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	13	JP09000284	JP		1997-01-07	Agency of Industrial Science & Technology	Eng Abstract	
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	24	JP2004504849	JP		2008-10-07	DSM IP Assets B.V.	Eng Equiv US7431952	
	25	JP2005244966	JP		2009-10-01	Byd Company Limited	Eng Equiv WO20090117869	
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	29	JP62278987	JP		1987-12-03	Kanegafuchi Chem Ind Co. Ltd.		☒
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	31	KR0112492	KR		1988-10-20	Danisco Bioteknologi A/S	Eng Equiv WO1988008025	☐
	32	KR10995575	KR		2010-11-19	Ruecker et al.		☐
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	36	WO1991007498	WO		1991-05-30	Phycotech Inc.		☐
	37	WO1996005278	WO		1996-02-22	Dr. Frische GmbH		☐
	38	WO1996021037	WO		1996-07-11	Martek Biosciences Corporation		☐
	39	WO1997004121	WO		1997-02-06	Zeneca Limited		☐
	40	WO1997036996	WO		1997-10-09	Gist-Brocades B.V.		☐
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	46	WO1999032604	WO		1999-07-01	DCV Inc.		☐
	47	WO200044862	WO		2000-08-03	Atlantis Marine Inc.		☐
	48	WO2001053512	WO	A1	2001-07-26	Omegatech Inc.		☐
	49	WO2002010423	WO		2002-02-07	DSM N.V.		☐
	50	WO2009117869	WO	A1	2009-10-01	Byd Company Limited	Eng Equiv of JP5244966	☐
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	54	WO2010120939	WO	A2	2010-10-21			☐
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	57	WO2011133181	WO	A1	2011-10-27			☐
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	1	AKOH ET AL., Food Lipids, Chemistry Nutrition and Biotechnology, 1998, 208-385	
	2	Alternative Methods of Extraction, Oil & Fats International, 1992, pgs. 29-32, Issue 6	
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	4	AYRES ET AL., Effect of divalent cations on permeabilizer-induced lysozyme lysis of Pseudomonas aeruginosa, Letters in Applied Microbiology, 1998, p. 372-374, Vol. 27, No. 6	
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	9	CHEN ET AL., Subcritical co-solvents extraction of lipid from wet microalgae pastes of Nannochloropsis sp., Eur. J. Lipid Sci. Technol., 2011, 205-212, 114(2)	
	10	CHRISTI ET AL., Disruption of Microbial Cells for Intracellular Products, Enzyme Microb. Technol., 1986, 194-204, 8	
	11	DOISAKI, NOBUSHIGE, 1st Declaration, dated April 10 2012, 2012, 8 Pages	
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	13	ENSSANI, E., Fundamental Parameters in Extraction of Lipids from Wastewater-grown Microalgal Biomass, Dissertation Thesis, Department of Civil Engineering, 1987, University of California, Berkeley	
	14	ENVIRON, Environ letter re GRAS Exemption Claim for DHA Rich Oil Derived from Tuna and ARA Rich Oil Derived from Mortierella Alpina Peyronel 1S-4 as Sources of DHA and AA in term and pre-term infant formula, dated December 18, 2001	
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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2018-08-20
Name/Print	Shannon McGarrah	Registration Number	55442

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Application Number	13151014	Filing Date	2011-06-01	Docket Number (if applicable)	28612-US-NP	Art Unit	1672
First Named Inventor	Cherinko			Examiner Name	Carr, Deborah		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

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Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the orde in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☐ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506635

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

X Patent Practitioner Signature

Applicant Signature

EFS - Web 2.1.16

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-01-02
Name	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is t
file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection
estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Tim
will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions fo
reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce,
P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the informatio solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record ma be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Deborah Carr
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	3878232		1975-04-15	Hayes , et al.	
	2	5173409		1992-12-22	Ecogen, Inc.	
	3	5683740		1997-11-04	Voultoury , et al.	
	4	9738851		2017-08-22	Ruecker , et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050239199	A1	2005-10-27	Baxter International	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Deborah Carr
	Attorney Docket Number	28612-US-NP

	1	JP2010500296	JP	T2	2010-01-07			
	2	JP2013099365	JP	A2	2013-05-23	Ruecker et al.		X
	3	JP2013532964	JP	T2	2013-08-22	Zirkle et al.		☐
	4	WO2012164211	WO	A1	2012-12-06	Roquette Freres		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	ATCC, ATCC 20891, 20891, 2018, http://www.atcc.org/products/all/20891.aspx	
	2	LIANG ET AL., Enzyme-Assisted Aqueous Extraction of Lipid from Microalgae, Journal of Agricultural and Food Chemistry, 2012, 11771-6, 60(47)	
	3	MANKOWICH ET AL., Coating and Chemical Laboratory, CCL Report No 137, 1963, 1-26	
	4	RATLEDGE ET AL., Down-stream processing, extraction, and purification of single cell oils, Single Cell Oils, 2005, 202-219, Chapter 13	
	5	XIA ET AL., Chemical Abstracts 2009, Preparation of virgin coconut oil by cellulase hydrolysis, 2009	

If you wish to add additional non-patent literature document citation information please click the Add button Add

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Deborah Carr
	Attorney Docket Number	28612-US-NP

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Deborah Carr
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-01-02
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	13151014
Filing Date:	01-Jun-2011
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Attorney Docket Number:	28612-US-NP
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**2140**

Electronic Acknowledgement Receipt	
EFS ID:	34741406
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	02-JAN-2019
Filing Date:	01-JUN-2011
Time Stamp:	16:47:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$2140
RAM confirmation Number	010319INTEFSW00003232506635
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	20190102_RCE_28612-US-NP.pdf	1349899 2b396a29ea53af59ec4f6d14c49ce42b673e7737	no	3
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	20190102_IDS7_28612-US-NP.pdf	1033659 508b4b29f89c5a6a8a04f183a550acc41ae040d2	no	5
Warnings:					
Information:					
3	Foreign Reference	JP2010500296_MT.pdf	931379 ace03e285ffd2b405f353e8bd4d20ec013968bb8	no	23
Warnings:					
Information:					
4	Foreign Reference	JP2013-099365_MT.pdf	1478815 c7eb64e76bfe92ee48b2e53ff526d166c60cdf20	no	38
Warnings:					
Information:					
5	Foreign Reference	JP2013532964_MT.pdf	8099597 b5f0705ebf6b27d76fd918df315ebd5be504c35c	no	159
Warnings:					
Information:					
6	Foreign Reference	WO2012164211.pdf	265949 62ba21f5c6c94bb3079666555956fe4e122d1357b	no	25
Warnings:					
Information:					

7	Non Patent Literature	ATCC_20891.pdf	95943 9835e683a5ad21e2baa293f36091f57d23eca6c8a	no	3
Warnings:					
Information:					
8	Non Patent Literature	Liang_2012_11771-11776.pdf	827758 fe3596808475de29e827623e11865d9adee3c7d8	no	6
Warnings:					
Information:					
9	Non Patent Literature	Mankowich_1963_1-26.pdf	2464672 945d5b44ed2a6fba5f28e99296097c50789 8f1a3	no	26
Warnings:					
Information:					
10	Non Patent Literature	Ratledge_2005_202-219.pdf	1809333 790c1a3286ef02df4aad543f1da4567bb9c60de1	no	18
Warnings:					
Information:					
11	Non Patent Literature	Xia_2009.pdf	53700 936cdb31fd976d3116d78ae9c95bcf43d8d955da	no	2
Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	32492 10fec5ee1a53d4160e523e2d0bf2c673a1c964e5	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	18443196		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 03/06/2019

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	**PAPER NUMBER**
1622	
NOTIFICATION DATE	**DELIVERY MODE**
03/06/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

dsm_PAIR@firsttofile.com
dsmna.ip@dsm.com

PTOL-90A (Rev. 04/07)

Office Action Summary	**Application No.** 13/151,014	**Applicant(s)** Cherinko et al.	
	Examiner DEBORAH D CARR	**Art Unit** 1622	**AIA (FITF) Status** No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 2 January 2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 52-58 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 52-58 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 1/2019.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED CORRESPONDENCE

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Interpretation

2. Claim 58 reads on cancelled claim 50. In an effort to promote compact prosecution, claim 58 with be interpreted to depend from claim 52.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 52-58 rejected under 35 U.S.C. 101 because the claimed invention is directed to a judicial exception (i.e. a law of nature, a nature phenomenon) without significantly more.

Claims 52-58 encompass an extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent, which are not markedly different from its naturally occurring counterpart because there is no indication that the extracted microbial lipid have any characteristics that are different from the naturally occurring lipid in cells.

The claim(s) does/do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the claims does not recite any additional elements.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file

provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

6. Claims 52-54 rejected on the ground of nonstatutory double patenting as being unpatentable over claims 20, 22 of U.S. Patent No. 8,207,363.

Although the claims at issue are not identical, they are not patentably distinct from each other because each claim set is drawn to the same invention, a microbial oil comprising a triglyceride fraction of at least or "at least about" a particular amount, in which the fatty acid residues are predominantly DHA and DPA. The copending dependent claims recite ingredients in the oil that need not be present, i.e., are below a particular level. The numerical ranges in the instant claims are not definite limitations, as discussed above. Consequently the numerical ranges in the two claim sets do not create different inventions.

Therefore, these inventions are not patentably distinct.

7. Examiner has made an earnest attempt to identify patents and patent applications for the purpose of rejecting claims that raise the question of double patenting. It is noted, however, that numerous co-pending applications have been filed

and continue to be filed, and patents have issued and continue to issue disclosing subject matter that is related to the instant application. Many of these patents and applications have the same title or a non-descriptive title. In the interest of compact prosecution, and to help ensure patent validity, Examiner requests that: 1) Applicants identify any patent(s) and/or co-pending application(s) that claim(s) subject matter that may necessitate a double patenting rejection, an obviousness-type double patenting rejection, a provisional double patenting rejection, or a provisional obviousness-type double patenting rejection; 2) identify the claims of the patents and/or co-pending applications that claim identical or similar subject matter; 3) identify the corresponding claims of the instant application, and 4) take the appropriate action, e.g., cancel claims to preempt a statutory double patenting rejection and/or file a terminal disclaimer to preempt an obvious-type double patenting rejection or provisional rejection.

Applicants' cooperation in following steps 1) to 4) above is appreciated as this will expedite prosecution and allow the examiner to focus on more substantive issues in the examination of the instant application. This is not a formal request for information under 37 CFR §1.105. But, Applicants' cooperation in this matter would be appreciated. A list of application serial nos., without substantive information, is not a complete reply to this request.

Claim Rejections - 35 USC § 112

8. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 52-57 rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claims 52-54 are vague and indefinite in its recitation of the phrase "a triacylglycerol fraction of at least 70% by weight" in that the metes and bounds of the term "a triacylglycerol fraction of at least 70% by weight" are unclear. It is unclear in reference to what the fraction is defined. As written, it is not possible to definitively determine what is within the scope of the triacylglycerol fraction of at least 70% by weight of the claims and, therefore, the metes and bounds of the claims as a whole are unclear. Is the triacylglycerol fraction of at least 70% by weight relative to a total lipid fraction, to a membrane lipid fraction, to 70% by weight of a phospholipid fraction, to a total fatty acids? The claims should be redrafted such that they particularly point out the components and, where necessary, the absolute amounts thereof within the composition. As such, the metes and bounds of the claims cannot be determined.

Claims 55-58 are indefinite insofar as they depend from claim 52.

10. Claim 58 recites the limitation "of claim 50" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 50 from which this claim depends from has been cancelled.

Claim Rejections - 35 USC § 103

11. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

13. Claims 52-54 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elswyk (US Pub. 2003/0060509, hereafter US Pub'509).

US Pub'509 discloses an infant formula comprising an oil that comprises HUFA's, including DHA, DPA and ARA. The oil may be prepared from Dinoflagellates, i.e., it may be a microbial oil. The oil, as a highly purified algal oil, comprises at least 70% triglycerides by weight. See Abstract and paragraphs 6, 7, 9, 43, 72, 84 and 85. The maternal supplement as a whole (the oil combined with phospholipids and/or proteins and/or dried marine microalgae) comprises about 20-80% DHA by weight and about 1-20% DPA by weight. The fatty acids in the purified algal oil are about 70-99% DHA by weight. See paragraphs 38 and 63-65.

Thus, the triglyceride fraction of the oil comprises at least 50% DHA and about 0.5-6% DPA. As discussed above, numbers in the claims that are preceded by the word "about" are not fixed quantities. Quantities of the anisidine value and organic

solvent that are less than a particular value may be zero. The reference does not disclose that the oil contains any organic solvent or the anisidine value.

The claimed invention is obvious, because, some of the quantities recited in the claims are explicitly disclosed in the reference. Other quantities recited in the claims are not explicitly disclosed in the reference. But, the quantities that are not explicitly disclosed may be calculated from the quantities that are disclosed.

14. Claims 52-54 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Apt et al (U.S. Patent No. 8,207,363, hereafter US'363).

US'363 discloses a microbial oil comprising a triglyceride fraction of at least or "at least about" a particular amount, in which the fatty acid residues are predominantly DHA and DPA. The copending dependent claims recite ingredients in the oil that need not be present, i.e., are below a particular level. The numerical ranges in the instant claims are not definite limitations, as discussed above. Consequently the numerical ranges in the two claim sets do not create different inventions.

Thus, the triglyceride fraction of the oil comprises at least 50% DHA and about 0.5-6% DPA. As discussed above, numbers in the claims that are preceded by the word "about" are not fixed quantities. Quantities of the anisidine value and organic solvent that are less than a particular value may be zero. The reference does not disclose that the oil contains any organic solvent or the anisidine value.

The claimed invention is obvious, because, some of the quantities recited in the claims are explicitly disclosed in the reference. Other quantities recited in the claims are not explicitly disclosed in the reference. But, the quantities that are not explicitly disclosed may be calculated from the quantities that are disclosed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBORAH D CARR whose telephone number is (571)272-0637. The examiner can normally be reached on Monday-Friday (10:30 am - 7:00 pm).

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fereydoun G Sajjadi can be reached on 572-272-3311. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEBORAH D. CARR/
Primary Examiner
Art Unit 1622

/DEBORAH D CARR/
Primary Examiner, Art Unit 1622

Notice of References Cited	Application/Control No. 13/151,014	Applicant(s)/Patent Under Reexamination Cherinko et al.	
	Examiner DEBORAH D CARR	Art Unit 1622	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20030060509-A1	03-2003	Elswyk, Mary Van	A61K31/202	514/560
*	B	US-8207363-B2	06-2012	Apt; Kirk E.	A23D9/00	554/224
	C					
	D					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
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	P					
	Q					
	R					
	S					
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

CPC - Searched*		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018, 2/2019	DDC
C11B3/02	9/2015, 1/2016, 7/2016, 9/2018, 2/2019	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018, 9/2018, 2/2019	DDC

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018, 2/2019	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018, 2/2019	ddc

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

Search Notes		
Search Notes	**Date**	**Examiner**
see transcript	8/2014, 9/2018	ddc
updated search	1/2015, 9/2018	ddc
updated search	9/2015, 9/2018	ddc
updated search	1/2016, 9/2018	ddc
updated search	7/2016, 9/2018	ddc
updated search	1/2017, 9/2018	ddc
updates search	2/2018, 9/2018	ddc
updated search	5/2018, 9/2018	
554/8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	ddc
435/134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	ddc
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018	DDC
C11B3/02	9/2015, 1/2016, 7/2016, 9/2018	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018, 9/2018	DDC
updated search	2/2019	ddc

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
435	134	8/2014, 2/2018, 5/2018, 9/2018	ddc
554	8, 223, 224, 227	8/2014, 2/2018, 5/2018, 9/2018	ddc
see areas searched		9/2015, 1/2016, 2/2018, 5/2018, 9/2018	ddc

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	DEBORAH D CARR	1622

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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	42	÷	=	✓	-	-	-	-	-	-

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1622

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
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	77		=	=	=	=	✓	✓	✓	-
	78		=	=	=	=	✓	✓	✓	-

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Deborah Carr
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	3878232		1975-04-15	Hayes , et al.	
	2	5173409		1992-12-22	Ecogen, Inc.	
	3	5683740		1997-11-04	Voultoury , et al.	
	4	9738851		2017-08-22	Ruecker , et al.	

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	1	20050239199	A1	2005-10-27	Baxter International	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Deborah Carr
	Attorney Docket Number	28612-US-NP

	1	JP2010500296	JP	T2	2010-01-07			
	2	JP2013099365	JP	A2	2013-05-23	Ruecker et al.		X
	3	JP2013532964	JP	T2	2013-08-22	Zirkle et al.		☐
	4	WO2012164211	WO	A1	2012-12-06	Roquette Freres		☐

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	1	ATCC, ATCC 20891, 20891, 2018, http://www.atcc.org/products/all/20891.aspx	
	2	LIANG ET AL., Enzyme-Assisted Aqueous Extraction of Lipid from Microalgae, Journal of Agricultural and Food Chemistry, 2012, 11771-6, 60(47)	
	3	MANKOWICH ET AL., Coating and Chemical Laboratory, CCL Report No 137, 1963, 1-26	
	4	RATLEDGE ET AL., Down-stream processing, extraction, and purification of single cell oils, Single Cell Oils, 2005, 202-219, Chapter 13	
	5	XIA ET AL., Chemical Abstracts 2009, Preparation of virgin coconut oil by cellulase hydrolysis, 2009	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Deborah Carr
	Attorney Docket Number	28612-US-NP

EXAMINER SIGNATURE			
Examiner Signature	/DEBORAH D CARR/	Date Considered	02/28/2019

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Deborah Carr
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-01-02
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/~~

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3	("20030060509").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/02/28 18:41
S1	5	("20050239199" | "3878232" | "5173409" | "5683740" | "9738851").PN.	US-PGPUB; USPAT	ADJ	ON	2019/02/27 12:54
S2	3	("20050115897").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/02/27 14:57
S3	0	exracted microbial lipid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2019/02/27 16:19
S4	16	extracted microbial lipid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2019/02/27 16:19
S5	90	("20050239199" | "3878232" | "5173409" | "5683740" | "9738851" | "20070077341" | "20080026103" | "20080038800" | "20080044875" | "20090061067" | "20100227042" | "20100233761" | "20110086386" | "20110252696" | "20110263709" | "20110295028" | "20120095246" | "20120119862" | "20120130099" | "2753362" | "3089821" | "4504473" | "4720456" | "4792418" | "5010004" | "5133963" | "5179012" | "5288619" | "5338673" | "5340742" | "5397591" | "5492938" | "5539133" | "5897994" | "5928696" | "5969169" | "6127185" | "6166231" | "6201145" | "6204401" | "6255505" | "6270828" | "6528941" | "6541049" | "6607900" | "6750048" | "6905861" | "6958229" | "7351558" | "7431952" | "7662598" | "7781193" | "20050170479" | "20060099693" | "20070003686" |	US-PGPUB; USPAT	ADJ	ON	2019/02/27 16:52

		"20080044876" | "20080148433" | "20090117194" | "20110256268" | "20110283602" | "20120190872" | "20120238732" | "20120244584" | "20130210093" | "20140212936" | "20150176042" | "20160010026" | "4906746" | "6344349" | "6451567" | "6509178" | "6582941" | "6812001" | "4680314" | "4857329" | "5476787" | "5951875" | "6180376" | "7527734" | "8192628" | "20070138094" | "20050115897" | "20080088489" | "20080107791" | "20100239533" | "20110177031" | "5130242" | "5340594" | "5583019" | "7163811").PN.				
S6	10893	triglycerides and dha	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2019/02/27 16:53
S7	2648	triglycerides and dha and dpa	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2019/02/27 16:53
S8	2648	S6 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2019/02/27 16:53
S9	22	S5 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2019/02/27 16:53

2/ 28/ 2019 7:33:23 PM

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8207363	B2	2012-06-26	Martek Biosciences Corporation	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030060509		2003-03-27	Mary van Elswyk	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.17

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	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	GRENVILLE ET AL., Mixing: Impeller Performance in Stirred Tanks, Chemical Engineering, August 2017, 42-51, US	
	2	PARTICLES SCIENCES 2009, Emulsions and Emulsification, Particles Sciences, 2009, 1-2, 9, US	

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Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-03-18
Name/Print	Shannon McGarrah	Registration Number	55442

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Electronic Patent Application Fee Transmittal					
Application Number:	13151014				
Filing Date:	01-Jun-2011				
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM				
First Named Inventor/Applicant Name:	Stephen Robert Cherinko				
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray				
Attorney Docket Number:	28612-US-NP				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					
Extension-of-Time:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	35453367
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	18-MAR-2019
Filing Date:	01-JUN-2011
Time Stamp:	15:29:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	031919INTEFSW00002203506635
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20190318_IDS8_28612-US-NP_EF.pdf	1042153 3ddc843edc1155aaf5e99443b2f77c5fe4847ea	no	4
Warnings:					
Information:					
2	Non Patent Literature	Particle_Sciences_2009.pdf	503649 cff350d2269286b845906dff923340d837d86a0c	no	2
Warnings:					
Information:					
3	Non Patent Literature	Grenville_2017.pdf	2178348 6d013b6df6ab357a7f12634f3519cb6a3f02eee8	no	10
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30801 0d3ccdd2e8b526271507a38d373c6d272b4ccf36	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3754951		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6447782	B1	2002-09-10	Parfums Christian Dior	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CN1447860	CN	A	2003-10-08	DSM N.V.		☓
	2	JP2000245492	JP	A2	2000-09-12	Kyowa Hakko Kogyo Co Ltd		☒
	3	JP2008541779	JP	T2	2008-11-27	DSM Nutritional Products AG		☒

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	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	4	WO2012062962	WO	A1	2012-05-18	Neste Oil Oyj		☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-03-29
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:	13151014			
Filing Date:	01-Jun-2011			
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM			
First Named Inventor/Applicant Name:	Stephen Robert Cherinko			
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray			
Attorney Docket Number:	28612-US-NP			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	35576586
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	29-MAR-2019
Filing Date:	01-JUN-2011
Time Stamp:	16:05:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	040119INTEFSW00003062506635
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20190329_IDS9_28612-US-NP.pdf	1033288 35b2372116b6bcdf112f92e8a2ef3d7cec6f634a	no	4
Warnings:					
Information:					
2	Foreign Reference	WO2012062962.pdf	1396912 b03c900a59cad38044c743205e0b65266fbb83b4	no	40
Warnings:					
Information:					
3	Foreign Reference	CN1447860_MT.pdf	1632374 be468f04eb17ae408899588ab0de62ec5f96d010	no	17
Warnings:					
Information:					
4	Foreign Reference	JP2000245492_MT.pdf	1202484 cc694cf6f5109b3fdf81684448f9a3572899b1f2	no	16
Warnings:					
Information:					
5	Foreign Reference	JP2008541779_MT.pdf	15336790 7c15c5c94b2336b0777ee1c10623740ecbdbe60e	no	81
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	30801 397f3d295e5141b1c4ff68fb49e17c9507aec779	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	20632649

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	COONEY ET AL., Extraction of Bio-oils from Microalgae, Separation & Purification Reviews, 2009, 291-325, 38(4)	
	2	MILLEDGE ET AL., A Review of the Harvesting of Micro-Algae for Biofuel Productio, Reviews in Environmental Science and Biotechnology, 2013, 165-78, 12(2)	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

X That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

X The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-04-04
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:	13151014			
Filing Date:	01-Jun-2011			
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM			
First Named Inventor/Applicant Name:	Stephen Robert Cherinko			
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray			
Attorney Docket Number:	28612-US-NP			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	35636114
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	04-APR-2019
Filing Date:	01-JUN-2011
Time Stamp:	23:19:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	040519INTEFSW00006571506635
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Cooney_2009_291-325.pdf	625038 fb9030d047883f96dc2cf18deb18b37f50fd4a64	no	36
Warnings:					
Information:					
2	Non Patent Literature	Milledge_2012_165-178_EF.pdf	262953 6c2e6066c6c5dbf59d98f502c9e7403c9568b24d	no	28
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	20190404_IDS10_28612-US-NP.pdf	1033195 d6d32fc701205137b540efe0b06d253b9c8a5b67	no	4
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30804 c9abffdc0cf11926b844757a1927d4b6d182897c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1951990		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt	
EFS ID:	36220895
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Laurie Tollas
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	06-JUN-2019
Filing Date:	01-JUN-2011
Time Stamp:	12:06:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	20190606_ReplyNonFinalOA_28612-US-NP.pdf	231327 55f71af02ac51e82b74ba44ce4ff3bb1672095f2	no	8
Warnings:					

Information:	
Total Files Size (in bytes):	231327

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New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 4148
CHERINKO et al.	Art Unit: 1671
Appl. No.: 13/151,014	Examiner: CARR, DEBORAH D.
Filing Date: June 1, 2011	Atty. Docket: 28612-US-NP

For: **EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM**

Commissioner for Patents - OPAP
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION

Dear Commissioner:

This paper is filed in response to the Non-Final Office Action dated March 6, 2019. Entry and consideration of the following amendments and remarks are respectfully requested.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Remarks/Arguments begin on page 4.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-51. (Cancelled)

52. (Currently Amended) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight of the lipid fraction, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 0.5 to 26 ~~or less~~, and wherein the lipid has less than 5% by weight of an organic solvent.

53. (Currently Amended) An extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight of the lipid fraction, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil has an anisidine value of 0.5 to 26 ~~or less~~, and wherein the lipid has less than 5% by weight of an organic solvent.

54. (Currently Amended) An extracted microbial lipid comprising a triglyceride fraction of at least about 70% by weight, of the lipid fraction wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight and wherein the oil has an anisidine value of 0.5 to 26 ~~or less~~, and wherein the lipid has less than 5% by weight of an organic solvent.

55. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a peroxide value of 5 or less.

56. (Previously Presented) The extracted microbial lipid of claim 52, wherein the oil has a phosphorus content of 100 ppm or less.

57. (Previously Presented) The extracted microbial lipid of claim 52, wherein the lipid is a crude oil.

58. (Currently Amended) A process for obtaining a lipid, the process comprising refining a crude lipid of claim 5~~0~~7.

59-78. (Cancelled)

REMARKS/ARGUMENTS

Claims 52-58 are pending. Claims 52-54 and 58 have been amended.

Reconsideration of this application based on the Amendments and Remarks presented herein is respectfully requested.

Claim Interpretation

Claim 58 reads on cancelled claim 50. Claim 58 has been amended to depend upon claim 57, which is dependent upon claim 52.

Rejection under 35 U.S.C. § 101

Claims 52-58 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to a judicial exception without significantly more.

The Office states claims 52-58 encompass an extracted microbial lipid comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the oil has an anisidine value of 26 or less, wherein the lipid has less than 5% by weight of an organic solvent, which are not markedly different from its naturally occurring counterpart because there is no indication that the extracted microbial lipids have any characteristics that are different from the naturally occurring lipid in cells.

Applicants submit that the Office failed to point to any natural product that has the same characteristics (e.g., triglyceride content and anisidine value as in independent claims 52-54; e.g., triglyceride content of at least 70% by weight of the lipid fraction and an anisidine value of 0.5-26) or oil profile (e.g., docosahexaenoic acid (DHA) and docosapentaenoic acid (DPA) as in independent claims 52-54; e.g., at least 50% DHA and 0.5-6% DPA) as claimed by the present invention.

Applicants submit that the Office failed to consider the fact that certain organisms are capable of producing compounds in artificial settings that they may never produce in nature. The Supreme Court in *Association for Molecular Pathology v. Myriad genetics, Inc.*, 569 U.S. _, 133, stated: "The possibility that an unusual and rare phenomenon *might* randomly create a molecule similar to one created synthetically through human ingenuity does not render a composition of

matter nonpatentable." Without being able to point to an existing microbial oil in nature that have the same characteristics or oil profile as the claimed oil, the Office at best shows that there is a mere possibility there might be such an oil existing in nature. A fair reading of the above passage suggests that the Office has not met its burden of showing non-patentability by merely showing possibility.

Furthermore, Applicants submit that the claimed microbial oil is produced by a strain in a fermenter and the characteristics and profile of the oil produced here are markedly different from its counterpart produced in nature. For example, oils produced in nature versus fermenter-produced oils as in the present invention contain a different lipid profile; oils produced in nature are enriched with phospholipids, whereas fermenter-produced oils contain more triglycerides, as claimed in the independent claims of the present invention.

Applicants notes that in the revised USPTO 2019 Revised Patent Subject Matter Eligibility Guidance it is stated that ""markedly different characteristics can be expressed as the product's structure, function, and/or other properties…", in addition, "non-limiting examples of the types of characteristics considered by the courts when determining whether there is a marked difference include: … chemical and physical properties; … structure and form, whether chemical, genetic or physical." (emphasis added by Applicants).

Applicants submit that the markedly different characteristics and oil profile in the claimed microbial oil distinguishes the claimed oil from its natural counterpart which has different characteristics and a different oil profile. For at least this reason, the claimed microbial oil is directed to statutory subject matter.

Accordingly, Applicants respectfully request the Office to withdraw its rejection.

Double Patenting

Claims 52-54 are rejected on the ground of non-statutory double patenting as unpatentable over claims 20, 22 of U.S. Patent No. 8,207,363.

Applicants respectfully submit that U.S. Patent No. 8,207,363 does not have claims 20 or 22. Attempts to reach the Office were unsuccessful, and clarification of this rejection is requested. To expedite prosecution, Applicants submit that the amended claims are patently distinct over claims 1-15 of U.S. Patent No. 8,207,363 for reasons provided below in the 35 U.S.C. § 103 rejection.

Accordingly, Applicants respectfully request the Office withdraw this rejection.

Rejection under 35 U.S.C. § 112, 2nd paragraph

A. Claims 52-57 are rejected under 35 U.S.C. § 112 2nd paragraph for failing to point out and distinctly claim the subject matter which Applicants regard as the invention.

The Office states claims 52-54 are vague and indefinite in its recitation of the phrase "a triacylglycerol fraction of at least 70% by weight" in that the metes and bounds of the term "a triacylglycerol fraction of at least 70% by weight" are unclear and further states it is unclear in reference to what the fraction is defined.

Claims 52-54 have been amended to define that the triglyceride fraction of at least 70% by weight is at least 70% by weight of the lipid fraction.

Accordingly, Applicants respectfully request the Office withdraw this rejection.

B. Claim 58 recites the limitation "of claim 50" in line 2 and there is insufficient antecedent basis for this limitation in the claim.

Claim 58 has been amended to depend from claim 52, thereby rendering this rejection moot.

Accordingly, Applicants respectfully request the Office withdraw this rejection.

Rejection under 35 U.S.C. § 103

A. Claims 52-54 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2003/0060509 to Elswyk ("Elswyk").

The Office states Elswyk discloses an infant formula comprising an oil that comprises HUFAs, including DHA, DPA and ARA, that may be prepared from Dinoflagellates, i.e., it may be a microbial oil, and the oil, as a highly purified algal oil, comprises at least about 70% triglycerides by weight. The Office further states the maternal supplement as a whole (the oil combined with phospholipids and/or proteins and/or dried marine microalgae) comprises about 20-80% DHA by weight and about 1-20% by weight and the fatty acids in the purified algal oil are about 70-99% DHA by weight and thus, the triglyceride fraction of the oil comprises at least 50% DHA and about 0.5-6% DPA.

As stated by the Office, the reference does not disclose that the oil contains any organic solvent or the anisidine value.

Claims 52-54 have been amended such that the anisidine value is 0.5 to 26. Elswyk does not disclose the anisidine value, as noted by the Examiner, nor does Elswyk teach or suggest a composition having such an anisidine value. Claims 52-54 are directed to extracted microbial oils, wherein the extraction process produces lower anisidine values than other extraction processes, *see*, e.g., Table2 7, 8a, 8b and 9.

Accordingly, Applicants respectfully request the Office withdraw this rejection.

B. Claims 52-54 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 8,207,363 to Apt et al. ("Apt").

The Office states Apt discloses a microbial oil comprising a triglyceride fraction of at least or "at least about" a particular amount, in which the fatty acid residues are predominantly DHA and DPA and thus, the triglyceride fraction of the oil comprises at least 50% DHA and about 0..5-6% DPA.

As stated by the Office, the reference does not disclose that the oil contains any organic solvent or the anisidine value.

Claims 52-54 have been amended such that the anisidine value is 0.5 to 26. Apt does not disclose the anisidine value, as noted by the Examiner, nor does Apt teach or suggest a composition having such an anisidine value. Claims 52-54 are directed to extracted microbial oils, wherein the extraction process produces lower anisidine values than other extraction processes, *see*, e.g., Table2 7, 8a, 8b and 9.

Accordingly, Applicants respectfully request the Office withdraw this rejection.

Conclusion

Having fully responded to the pending Office Action, Applicants submit that the claims are in condition for allowance and earnestly solicit an early Notice to that effect. The Examiner is invited to contact the undersigned to resolve any issues. If any fees or extensions are required, Applicant petitions for an extension of time and authorizes the payment of any fees (or any

deficiency therein) to be charged to Deposit Account No. 50-6635, referencing Attorney Docket No. 28612-US-NP.

Respectfully submitted,

DSM North America, Inc.

By: /Shannon McGarrah/
Shannon McGarrah
Attorney for Applicant
Reg. No. 55,442
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6480 Dobbin Road
Columbia, MD 21045
Telephone: 443-543-2395

Date: June 6, 2019

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/151,014	Filing Date 06/01/2011	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $52 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $220 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	06/06/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 7	Minus	** 42	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 6	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/TINA J BARDEN/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
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NOTICE OF ALLOWANCE AND FEE(S) DUE

109143 7590 06/26/2019

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER
CARR, DEBORAH D

ART UNIT	PAPER NUMBER
1622	

DATE MAILED: 06/26/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	09/26/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

109143 7590 06/26/2019

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	09/26/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
CARR, DEBORAH D	1622	554-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

109143 7590 06/26/2019

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

EXAMINER	
CARR, DEBORAH D	
ART UNIT	**PAPER NUMBER**
1622	

DATE MAILED: 06/26/2019

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/151,014	Applicant(s) Cherinko et al.	
	Examiner DEBORAH D CARR	Art Unit 1622	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to amendment filed 6 June 2019.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 52-58 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/2019, 4/2019.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DEBORAH D CARR/
Primary Examiner, Art Unit 1622

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
	1	÷	=	=	=	=	✓	✓	✓	-
	2	÷	=	=	=	=	✓	-	-	-
	3	÷	=	=	=	=	✓	✓	-	-
	4	÷	=	=	=	=	✓	✓	✓	-
	5	÷	-	-	-	-	-	-	-	-
	6	÷	=	=	=	=	✓	✓	✓	-
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	8	÷	=	=	=	=	✓	✓	✓	-
	9	÷	-	-	-	-	-	-	-	-
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	12	÷	-	-	-	-	-	-	-	-
	13	÷	-	-	-	-	-	-	-	-
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	33	÷	=	-	=	=	✓	✓	✓	-
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	38	÷	-	-	-	-	-	-	-	-
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	41	÷	=	✓	=	=	✓	✓	-	-
	42	÷	=	✓	-	-	-	-	-	-

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

CLAIM		DATE								
Final	Original	11/25/2013	08/04/2014	01/12/2015	09/29/2015	01/26/2016	07/15/2016	01/19/2017	10/16/2017	02/20/2018
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	45	÷	=	✓	=	=	✓	✓	✓	-
	46	÷	=	✓	=	=	✓	✓	✓	-
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	78		=	=	=	=	✓	✓	✓	-

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1622

CPC						
Symbol					**Type**	**Version**
C11B	/	1	/	10	F	2013-01-01
C11B	/	3	/	02	I	2013-01-01
C11B	/	3	/	16	I	2013-01-01
Y02E	/	50	/	16	A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner, Art Unit 1671	23 June 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190623

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1622

INTERNATIONAL CLASSIFICATION				
CLAIMED				
C11B1/10	/	1	/	10
C11B3/02	/	3	/	02
C11B3/16	/	3	/	16
C12P	/	7	/	64
C11B	/	1	/	00
A01H	/	5	/	10
A23D	/	9	/	00

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
554	8

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
435	134					
554	223	224	227			

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner, Art Unit 1671	23 June 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190623

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	**Art Unit**
	DEBORAH D CARR	1622

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	2		12		22		32		42	1	52		62		72
	3		13		23		33		43	2	53		63		73
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	5		15		25		35		45	4	55		65		75
	6		16		26		36		46	5	56		66		76
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	9		19		29		39		49		59		69		
	10		20		30		40		50		60		70		

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	7	
/DEBORAH D CARR/ Primary Examiner, Art Unit 1671	23 June 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190623

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

CPC - Searched*		
Symbol	Date	Examiner
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018, 2/2019, 6/2019	DDC
C11B3/02	9/2015, 1/2016, 7/2016, 9/2018, 2/2019, 6/2019	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018, 9/2018, 2/2019, 6/2019	DDC

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
554	8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018, 2/2019, 6/2019	ddc
435	134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018, 5/2018, 9/2018, 2/2019, 6/2019	ddc

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/DEBORAH D CARR/ Primary Examiner, Art Unit 1622	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

Search Notes		
Search Notes	**Date**	**Examiner**
see transcript	8/2014, 9/2018	ddc
updated search	1/2015, 9/2018	ddc
updated search	9/2015, 9/2018	ddc
updated search	1/2016, 9/2018	ddc
updated search	7/2016, 9/2018	ddc
updated search	1/2017, 9/2018	ddc
updates search	2/2018, 9/2018	ddc
updated search	5/2018, 9/2018,	
554/8, 223, 224, 227	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018 , 5/2018, 9/2018, 6/2019	ddc
435/134	8/2014, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018 , 5/2018, 9/2018, 6/2019	ddc
C11B1/10	9/2015, 1/2016, 7/2016, 1/2017, 10/2017, 2/2018 , 5/2018, 9/2018, 6/2019	DDC
C11B3/02	9/2015, 1/2016, 7/2016, 9/2018, 6/2019	DDC
C11B3/16	9/2015, 1/2016, 7/2016, 1/2017,10/2017, 2/2018, 5/2018, 9/2018, 6/2019	DDC
updated search	2/2019, 6/2019	ddc

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
435	134	8/2014, 2/2018, 5/2018, 9/2018, 6/2019	ddc
554	8, 223, 224, 227	8/2014, 2/2018, 5/2018, 9/2018, 6/2019	ddc
see areas searched		9/2015, 1/2016, 2/2018, 5/2018, 9/2018, 6/2019	ddc

/DEBORAH D CARR/ Primary Examiner, Art Unit 1622	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/151,014	Cherinko et al.
	Examiner	Art Unit
	DEBORAH D CARR	1622

/DEBORAH D CARR/ Primary Examiner, Art Unit 1622	

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8207363	B2	2012-06-26	Martek Biosciences Corporation	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030060509		2003-03-27	Mary van Elswyk	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	GRENVILLE ET AL., Mixing: Impeller Performance in Stirred Tanks, Chemical Engineering, August 2017, 42-51, US	
	2	PARTICLES SCIENCES 2009, Emulsions and Emulsification, Particles Sciences, 2009, 1-2, 9, US	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/DEBORAH D CARR/	Date Considered	06/23/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

X That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

X The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-03-18
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/~~

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6447782	B1	2002-09-10	Parfums Christian Dior	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CN1447860	CN	A	2003-10-08	DSM N.V.		☓
	2	JP2000245492	JP	A2	2000-09-12	Kyowa Hakko Kogyo Co Ltd		☒
	3	JP2008541779	JP	T2	2008-11-27	DSM Nutritional Products AG		☒

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	4	WO2012062962	WO	A1	2012-05-18	Neste Oil Oyj		☐

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NON-PATENT LITERATURE DOCUMENTS [Remove]

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature	/DEBORAH D CARR/	Date Considered	06/23/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-03-29
Name/Print	Shannon McGarrah	Registration Number	55442

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/~~

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

U.S.PATENTS Remove

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13151014
	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

	1	COONEY ET AL., Extraction of Bio-oils from Microalgae, Separation & Purification Reviews, 2009, 291-325, 38(4)	
	2	MILLEDGE ET AL., A Review of the Harvesting of Micro-Algae for Biofuel Productio, Reviews in Environmental Science and Biotechnology, 2013, 165-78, 12(2)	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/DEBORAH D CARR/	Date Considered	06/23/2019

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Signature	/Shannon McGarrah/	Date (YYYY-MM-DD)	2019-04-04
Name/Print	Shannon McGarrah	Registration Number	55442

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

109143 7590 06/26/2019

DSM North America Inc.
Patent Department
6480 Dobbin Road
Columbia, MD 21045

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

VIA EFS WEB	(Typed or printed name)
	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/151,014	06/01/2011	Stephen Robert Cherinko	28612-US-NP	4148

TITLE OF INVENTION: EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	09/26/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
CARR, DEBORAH D	1622	554-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Shannon McGarrah
2 Xi Chen
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: DSM IP Assets B.V.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): TE Heerlen, Netherlands

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ☒ Corporation or other private group entity ❑ Government

4a. Fees submitted: ☒ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

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5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Shannon McGarrah/ Date July 8, 2019

Typed or printed name Shannon McGarrah Registration No. 55442

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal	
Application Number:	13151014
Filing Date:	01-Jun-2011
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Attorney Docket Number:	28612-US-NP
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt	
EFS ID:	36516745
Application Number:	13151014
International Application Number:	
Confirmation Number:	4148
Title of Invention:	EXTRACTION OF LIPID FROM CELLS AND PRODUCTS THEREFROM
First Named Inventor/Applicant Name:	Stephen Robert Cherinko
Customer Number:	109143
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	28612-US-NP
Receipt Date:	08-JUL-2019
Filing Date:	01-JUN-2011
Time Stamp:	14:45:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1000
RAM confirmation Number	070919INTEFSW00001400506635
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30714 7bba76e31f3522f3292b01e8d0267f6d9f123c13	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	160051		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2011-06-01
	First Named Inventor	CHERINKO
	Art Unit	1672
	Examiner Name	Carr, Deborah
	Attorney Docket Number	28612-US-NP

Change(s) applied to document, /J.H./ 7/25/2019	12	20130210093	A1	2013-08-15	Pottathil et al. ~~IO-Mega Holding Corporation~~	
	13	20140212936	A1	2014-07-31	Ruecker et al. ~~DSM IP Assets B.V~~.	
	14	20150176042	A1	2015-06-25	Dennis et al. ~~MARA Renewables Corporation~~	
	15	20160010026	A1	2016-01-14	Dennis et al. ~~MARA Renwables Corporation~~	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	CA2076018	CA	C	1991-08-14	Martek Corporation		
	2	CA2146235	CA	C	1994-04-28	DSM IP Assets B.V.		
	3	CA2397655	CA	A1	2001-07-26	Omegatech Inc.		
	4	CA2611324	CA	A1	2007-06-21	DSM Nutritional Products AG		
	5	CA2801011	CA	A1	2011-12-08	DSM IP Assets B.V.		

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	1	20050170479	A1	2005-08-04	Kobzeff et al.	
	2	20060099693		2006-05-11	NA	
Change(s) applied to document, /J.H./ 7/25/2019	3	20070003686	A1	2007-01-04	Fichtali et al. ~~Martek Biosciences Corporation~~	
	4	20080044876	A1	2008-02-21	Ruecker et al. ~~Martek Biosciences Corporation~~	
	5	20080148433	A1	2008-06-19	Metz et al.	
	6	20090117194	A1	2009-05-07	Burja et al.	
	7	20110256268	A1	2011-10-20	Franklin et al. ~~Solazyme Inc.~~	
	8	20110283602	A1	2011-11-24	Gallop et al. ~~ICM Inc.~~	
	9	20120190872	A1	2012-07-26	Cranford et al. ~~Sapphire Energy Inc.~~	
	10	20120238732	A1	2012-09-20	Wang ~~Iowa State University Research Foundation~~	
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Application Number	13151014
Filing Date	2011-06-01
First Named Inventor	CHERINKO
Art Unit	1672
Examiner Name	Carr, Deborah
Attorney Docket Number	28612-US-NP

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	2	EP1905309A1	EP	A1	2008-04-02	SemBioSys Genetics Inc.		☐
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	Art Unit	1672
	Examiner Name	CARR, DEBORAH D.
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	4	20080088489		2008-04-17	Moon ~~Samsung Electronics Co., Ltd.~~	
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	1	01/0076385	WO	A1	2001-10-18	West-Falia Separator Industry GmbH		☐
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	2	JP2000245492	JP	A2	2000-09-12	Kyowa Hakko Kogyo Co Ltd		☒
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Change(s) applied to document, /J.H./ 7/26/2019	1	8207363	B2	2012-06-26	Apt et al. ~~Martek Biosciences Corporation~~	

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	1	20030060509		2003-03-27	Mary van Elswyk	

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Change(s) applied to document, /J.H./ 7/26/2019	2	5173409		1992-12-22	English ~~Ecogen, Inc.~~	
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	1	20050239199	A1	2005-10-27	Kunas et al. ~~Baxter International~~	

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Art Unit	1672
Examiner Name	Carr, Deborah D.
Attorney Docket Number	28612-US-NP

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
Change(s) applied to document, /J.H./ 7/26/2019	1	2753362		1956-07-03	Owades et al. ~~Standard Brands Incorporated~~	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.D.C/

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

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IR103 (Rev. 10/09)