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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/407,687	03/19/2009	Kirk E. APT	

109143
DSM Services USA
6480 Dobbin Road
Columbia, MD 21045

CONFIRMATION NO. 7806
POA ACCEPTANCE LETTER



Date Mailed: 02/20/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/05/2014.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/dtvernon/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS

CONFIRMATION NO. 7806

POWER OF ATTORNEY NOTICE

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005



Date Mailed: 02/20/2014

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/05/2014.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/dtvernon/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number:

109143

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number:

109143

OR

☐	Firm or Individual Name
	Address
	City
	State
	Zip
	Country
	Telephone
	Email

Assignee Name and Address: DSM IP ASSETS B.V.
HET OVERLOON 1
6411 TE HEERLEN
NETHERLANDS

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/86 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date September 10, 2013
Name	Jacqueline Cohen, Reg. No. 51574	Telephone 240-512-2704
Title	Senior Patent Attorney	

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 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.

Electronic Acknowledgement Receipt

EFS ID:	18123656
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Shannon Elizabeth McGarrah/Kimberly Sauter-Bray
Filer Authorized By:	Shannon Elizabeth McGarrah
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	05-FEB-2014
Filing Date:	19-MAR-2009
Time Stamp:	16:30:03
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	Power of Attorney	20130912_POA_109143.pdf	788491 b78d350b341a362b51ebc895b8cc05f0506ceffd	no	1

Warnings:

Information:

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.



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	06/26/2012	8207363	2715.0030000/JUK/SAS	7806

26111 7590 06/06/2012
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

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 304 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.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Kirk E. APT, Ellicott City, MD;
Joseph W. Pfeifer III, Westminster, MD;
Jon Milton Hansen, Lexington, KY;
Paul Warren Behrens, Ellicott City, MD;
Ross Zirkle, Longmont, CO;
Tracey Lynn Stahl, Pasadena, MD;

Substitute for form 1449/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	12/407,687
		Filing Date	March 19, 2009
		First Named Inventor	Kirk E. APT
		Art Unit	1652
		Examiner Name	KOSSON, Rosanne
		Attorney Docket Number	2715.0030000/JUK/SAS/KPQ
Sheet	3	of	4

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	US44	2002/0026063 A1	02-28-2002	Luthria	
	US45	2002/0123111 A1	09-05-2002	Gladue <i>et al.</i>	
	US46	2003/0143659 A1	07-31-2003	Bijl <i>et al.</i>	
	US47	2003/0161864 A1	08-28-2003	Tanaka <i>et al.</i>	
	US48	2003/0180898 A1	09-25-2003	Bailey <i>et al.</i>	
	US49	2004/0067574 A1	04-08-2004	Bijl <i>et al.</i>	
	US50	2004/0161831 A1	08-19-2004	Komazawa <i>et al.</i>	
	US51	2004/0203120 A1	10-14-2004	Kumar <i>et al.</i>	
	US52	2004/0236128 A1	11-25-2004	Rubin	
	US53	2005/0019880 A1	01-27-2005	Raghukumar <i>et al.</i>	
	US54	2005/0129831 A1	06-16-2005	Fabritius	
	US55	2005/0170479 A1	08-04-2005	Weaver <i>et al.</i>	
	US56	2005/0202148 A1	09-15-2005	Streekstra <i>et al.</i>	
	US57	2005/0287651 A1	12-29-2005	Akimoto <i>et al.</i>	
	US58	2006/0110806 A1	05-25-2006	Damude <i>et al.</i>	
	US59	2006/0115881 A1	06-01-2006	Damude <i>et al.</i>	
	US60	2006/0141592 A1	06-29-2006	Sumida <i>et al.</i>	
	US61	2006/0286648 A1	12-21-2006	Bailey <i>et al.</i>	
	US62	2007/0003686 A1	01-04-2007	Fichtali <i>et al.</i>	
	US63	2007/0015263 A1	01-18-2007	Wumpelmann	
	US64	2007/0148315 A1	06-28-2007	Schaap <i>et al.</i>	
	US65	2007/0269507 A1	11-22-2007	Sachetto <i>et al.</i>	
	US66	2007/0299134 A1	12-27-2007	Miller <i>et al.</i>	
	US67	2008/0009045 A1	01-10-2008	Komazawa <i>et al.</i>	
	US68	2008/0020033 A1	01-24-2008	Kawashima <i>et al.</i>	
	US69	2008/0026103 A1	01-31-2008	Fichtali <i>et al.</i>	
	US70	2008/0032353 A1	02-07-2008	Behrens <i>et al.</i>	
	US71	2008/0038789 A1	02-14-2008	Higashiyama	
FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ³ Number ² Kind Code ² (if known)			
	FP13	WO 2007/069078 A2	06-21-2007	Ocean Nutrition Canada Ltd.	
	FP14	WO 2008/067605 A1	06-12-2008	Biomass Research & Refining Pty Ltd.	

Examiner Signature	Date Considered
--------------------	-----------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. *Applicant's unique citation designation number (optional). * See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. * Enter Office that issued the document, by the two-letter code (WIPO Standard ST.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. * Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. * Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, 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 (1-800-786-9199) and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /RK/

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)

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.

26111 7590 02/29/2012
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
 1100 NEW YORK AVENUE, N.W.
 WASHINGTON, DC 20005

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.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806

TITLE OF INVENTION: THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	05/29/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
KOSSON, ROSANNE	1657	554-224000

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 **Sterne, Kessler, Golstein &**
 2 **Fox, P.L.L.C.**
 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 3.111. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

MARTEK BIOSCIENCES CORPORATION

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

COLUMBIA, MD

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) have been submitted:

- ☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - 4 of 5 copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

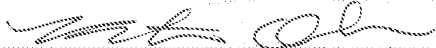
- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number **19-0036** (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature



Date

May 29, 2012

Typed or printed name

Katrina P. Quach

Registration No.

51,063

This collection of information 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.

Electronic Patent Application Fee Transmittal				
Application Number:	12407687			
Filing Date:	19-Mar-2009			
Title of Invention:	THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF			
First Named Inventor/Applicant Name:	Kirk E. APT			
Filer:	Katrina Y.Pei Quach/Lauren Harrison			
Attorney Docket Number:	2715.0030000/JUK/SAS			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
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	1740	1740
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2040

Electronic Acknowledgement Receipt	
EFS ID:	12880926
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Katrina Y.Pei Quach/Lauren Harrison
Filer Authorized By:	Katrina Y.Pei Quach
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	29-MAY-2012
Filing Date:	19-MAR-2009
Time Stamp:	16:39:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$2040
RAM confirmation Number	4739
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1		27150030000issuefeepmt.pdf	367596 fceb3d4b4b6a6520ad4f31837be75077a3a dfaa	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Miscellaneous Incoming Letter		1	1	
	Issue Fee Payment (PTO-85B)		2	2	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32258 8a4cf6e0a7822c0beb338d0a4844006eee 58598	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			399854		
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					

KATRINA QUACH
ASSOCIATE*
(202) 772-8963
KQUACH@SKGF.COM



May 29, 2012

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

Confirmation No. 7806
Mail Stop Issue Fee

Re: Allowed U.S. Utility Patent Application
Appl. No. 12/407,687; Filed: March 19, 2009
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making and
Uses Thereof**
Inventors: APT *et al.*
Our Ref: 2715.0030000/JUK/SAS/KPQ

Commissioner:

In response to the **Notice of Allowance and Fee(s) Due** dated February 29, 2012, the following documents are transmitted for appropriate action by the U.S. Patent and Trademark Office:

1. Issue Fee Transmittal (Form PTOL-85); and
2. Online Credit Card Payment Authorization for \$2,040.00 to cover:
\$1,740.00 - Issue Fee;
\$300.00 - Publication Fee.

The above-listed documents are filed electronically through EFS-Web.

Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Katrina Quach
Attorney for Applicants
Registration No. 51,063

JUK/KPQ/leh
Enclosures
1506331_1.DOCX

*Admitted only in Maryland



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

26111 7590 02/29/2012
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

KOSSON, ROSANNE

ART UNIT

PAPER NUMBER

1657

DATE MAILED: 02/29/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806

TITLE OF INVENTION: THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	05/29/2012

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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.

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)

26111 7590 02/29/2012
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

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.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806

TITLE OF INVENTION: THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	05/29/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
KOSSON, ROSANNE	1657	554-224000

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, 1 _____
(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. 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 credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information 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.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806

26111 7590 02/29/2012
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

KOSSON, ROSANNE

ART UNIT	PAPER NUMBER
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1657

DATE MAILED: 02/29/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 304 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 304 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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.	Applicant(s)	
	12/407,687	APT ET AL.	
	Examiner	Art Unit	
	ROSANNE KOSSON	1657	

-- 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 an examiner's amendment approved by Applicants on Feb. 6, 2012.
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 51-65.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - 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. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
 - (b) ☐ 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).
7. ☐ 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)

<ol style="list-style-type: none"> 1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>1/30/12</u> 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material 	<ol style="list-style-type: none"> 5. ☐ Notice of Informal Patent Application 6. ☒ Interview Summary (PTO-413), Paper No./Mail Date <u>2/6/12</u>. 7. ☒ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other ____.
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/Rosanne Kosson/ Primary Examiner, Art Unit 1657	
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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicants' representative, Mr. Scott Schaller, on February 6, 2012.

The application has been amended as follows. The claims have been amended as follows. Claims 1-65 remain as shown in the claim set filed on October 13, 2011. Of these claims, claims 1-50 have been canceled. Claims 66-99, drawn to non-elected inventions, have been canceled, as indicated below.

66-99. canceled

The following is an examiner's statement of reasons for allowance. The claimed invention is free of the prior art. As discussed in the previous Office actions, the closest prior art is Van Elswyk (US 2003/0060509 A1), who discloses a microbial oil comprising at least 70% by weight of desired HUFA's (such as DHA, DPA and ARA), or comprising, i.e., a triglyceride and phospholipid. Applicants have confirmed on the record in related Application No. 10/228843, now abandoned, that the foregoing is the interpretation of the reference (see paragraphs 29, 63 and 74) and that these paragraphs do not mean that the microbial oil comprises at least 70% by weight of a triglyceride (or at least 70% by weight one of the other ingredients disclosed in the reference). The claims recite that the microbial oil comprises at least 70% by weight of a triglyceride fraction. See Response filed in the related case on August 3, 2005, p. 9.

Art Unit: 1657

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSANNE KOSSON whose telephone number is (571)272-2923. The examiner can normally be reached on Mon., Thurs., Fri., 8:30-6:00, Tues., 8:30-2:00, Wed. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. 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.

/Rosanne Kosson/
Primary Examiner, Art Unit 1657
2012-02-06



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

CONFIRMATION NO. 7806

SERIAL NUMBER 12/407,687	FILING or 371(c) DATE 03/19/2009 RULE	CLASS 424	GROUP ART UNIT 1657	ATTORNEY DOCKET NO. 2715.0030000/JUK/SAS		
APPLICANTS Kirk E. APT, Ellicott City, MD; Joseph W. Pfeifer III, Westminster, MD; Jon Milton Hansen, Lexington, KY; Paul Warren Behrens, Ellicott City, MD; Ross Zirkle, Longmont, CO; Tracey Lynn Stahl, Pasadena, MD; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 04/16/2009						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged <u>/ROSANNE KOSSON/</u> Examiner's Signature		☐ Met after Allowance 2/7/12 Initials	STATE OR COUNTRY MD	SHEETS DRAWINGS 0	TOTAL CLAIMS 50	INDEPENDENT CLAIMS 13
ADDRESS STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005 UNITED STATES						
TITLE Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof						
FILING FEE RECEIVED 5994	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees		
				☐ 1.16 Fees (Filing)		
				☐ 1.17 Fees (Processing Ext. of time)		
				☐ 1.18 Fees (Issue)		
				☐ Other _____		
			☐ Credit			

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	635	martek as.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/07 08:20
L2	410	1 and oil	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/07 08:20
L3	321	2 and microbial	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/07 08:20
L4	106	3 and triglyceride	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/07 08:20
L5	91	4 and docosahexaenoic	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/07 08:21
L6	83	5 and docosapentaenoic	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/07 08:21
S1	10	(7163811 7252979 7871809 7824892 7829129 7745183 7732170 7579174).pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 16:48
S2	57	(6812009 6372460 7897391 7629450 7718431 7560539 7897392 7799564 7879608 7897393 7902427 7902427 7906706 7601522 7803620 7626009 7217856).pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 16:58
S3	1107	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:06
S4	66	S3 near40 (docosapentaenoic or dpa)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:08
S5	26	S4 near40 oil	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:08
S6	21	S5 and @ad<"20090319"	US-PGPUB; USPAT;	ADJ	ON	2011/07/07 17:12

			EPO, JPO, DERWENT			
S7	1107	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S8	66	S7 near40 (docosapentaenoic or dpa)	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S9	26	S8 near40 oil	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S10	21	S9 and @ad< '20090319"	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S11	2	"7588791".pn.	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 14:35
S12	2	"7588791".pn.	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 14:36
S13	8	(6509178 6905850 20040059142).pn.	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 15:40
S14	597	martek.as.	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:27
S15	137	S14 and triglyceride	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:27
S16	111	S15 and dha	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:27
S17	75	S16 and dpa	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:28
S18	73	S17 and oil	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:28
S19	47	S18 and formula	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:28
S20	2	("20030060509").pn.	US-PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/10/20 14:33

S21	173	"20010041358" "20020001833" "20020026063" "20020123111" "20030143659" "20030161864" "20030180898" "20040067574" "20040161831" "20040203120" "20040236128" "20050019880" "20050129831" "20050170479" "20050202148" "20050287651" "20060110806" "20060115881" "20060141592" "20060286648" "20070003666" "20070015263" "20070148315" "20070269507" "20070299134" "20080009045" "20080020033" "20080026103" "20080032353" "20080038789" "20080076164" "20080107791" "20080166781" "20080199923" "20080234377" "20080292681" "20090004219" "20090011012" "20090093543" "20090099261" "20090192304" "20090304784" "20100099765" "20100130610" "20100167359" "20100178366" "20100266564" "20100285105" "20110177031" "4485173" "4916066" "5130242" "5244921" "5246841" "5314812" "5340594" "5340742" "5401646" "5547699" "5698244" "6180376" "6248909" "6255505" "6372460" "6410282" "6441208" "6451567" "6461839" "6509178" "6566123" "6579714" "6582941" "6596766" "6607900" "6677470" "6727373" "6746857" "6783951" "6812009" "6844021" "6846942" "7005280" "7011962" "7022512" "7259006" "7514244" "7709236" "7723386" "7767427" "7863026". PN.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 09:16
S22	2	"6399803".pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 15:18
S23	1176	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 16:38
S24	70	S23 near40 (dpa or dpa(n-6) or docosapentaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 16:39
S25	56	S24 and @ad<"20090319"	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 16:40
S26	12	("20070054384" "20070112071" "20080311645" "20090117194" "6531150" "7741500").PN.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/06 13:51
S27	1220	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/06 13:53
S28	76	S27 near40 (dpa or dpa(n-6) or docosapentaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/06 13:53
S29	31	S28 near40 oil	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/06 13:53
S30	22	S29 and @ad<"20090319"	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2012/02/06 13:54

EAST Search History (Interference)

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2/7/2012 8:26:40 AM

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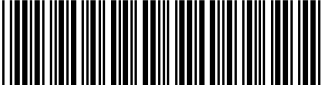
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(FILE 'HOME' ENTERED AT 07:28:54 ON 07 FEB 2012)

FILE 'CAPLUS, BIOSIS' ENTERED AT 07:29:11 ON 07 FEB 2012

L1	465 S TRIGLYCERIDE (40N) (DHA OR DOCOSAHEXAENOIC)
L2	5 S L1(40N)(DPA OR DPAN-6 OR DOCOSAPENTAENOIC)
L3	138 S L1(40N)OIL
L4	143 S L3 OR L2
L5	113 DUP REM L4 (30 DUPLICATES REMOVED)
L6	81 S L5 NOT PATENT/DT
L7	78 S L6 AND PD<20090319
L8	32 S L5 AND PATENT/DT
L9	23 S L8 AND AD<20090319

=> app.no. 12/407687

Search Notes 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/407,687	APT ET AL.	
	Examiner	Art Unit	
	ROSANNE KOSSON	1657	

SEARCHED			
Class	Subclass	Date	Examiner
554	224, 8	2/7/12	RK
426	601	2/7/12	RK
435	134	2/7/12	RK
514	560	2/7/12	RK

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
554	224	2/7/12	RK
554	8	2/7/12	RK
426	601	2/7/12	RK
435/134; 514/560		2/7/12	RK

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
updated searches of 10/24/11 in USPAT, USPGPUB, EPO, JPO, Derwent; caplus, biosis (see attached search histories)	2/6/11	RK
all inventor names searched in eDAN	2/6/11	RK

<p align="center">Index of Claims</p> 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	12/407,687		APT ET AL.	
	Examiner		Art Unit	
	ROSANNE KOSSON		1657	

✓	Rejected	—	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim		Date									
Final	Original	2/7/12									
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Final	Original	2/7/12									
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Claim		Date									
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Issue Classification 	Application/Control No. 12/407,687	Applicant(s)/Patent under Reexamination APT ET AL.
	Examiner ROSANNE KOSSON	Art Unit 1657

ISSUE CLASSIFICATION														
ORIGINAL					INTERNATIONAL CLASSIFICATION									
CLASS		SUBCLASS			CLAIMED					NON-CLAIMED				
554		224			A	23	D	9	/00					/
CROSS REFERENCES					C	11	B	1	/00					/
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)													
554	8				C	12	P	07	/64					/
426	601				A	61	K	31	/202					/
435	134								/					/
514	560								/					/
									/					/

(Assistant Examiner) (Date)	/Rosanne Kosson/, 2/7/12 (Primary Examiner) (Date)	Total Claims Allowed: 15	
(Legal Instruments Examiner) (Date)		O.G. Print Claim(s) 1	O.G. Print Fig. -

☐ 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		
	1		31	11	61		91		121		151		181		
	2		32	12	62		92		122		152		182		
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	4		34	14	64		94		124		154		184		
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	6		36		66		96		126		156		186		
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	18		48		78		108		138		168		198		
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	27	7	57		87		117		147		177		207		
	28	8	58		88		118		148		178		208		
	29	9	59		89		119		149		179		209		
	30	10	60		90		120		150		180		210		

[illegible][illegible]

Examiner Signature		Date Considered	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /BK/

Substitute for form 1449/PTO				Complete if Known	
FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Application Number	12/407,687
				Filing Date	March 19, 2009
				First Named Inventor	APT <i>et al.</i>
				Art Unit	1657
				Examiner Name	KOSSON, Rosanne
Sheet	1	of	2	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ³	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, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
	NPL41	BARCLAY, W., <i>et al.</i> , "Development of a Docosahexaenoic Acid Production Technology Using <i>Schizochytrium</i> : A Historical Perspective" in <i>Single Cell Oils</i> , Ratledge, C. and Cohen Z., eds., American Oil Chemists Society Publishing, United States, pp. 36-52 (2005)	
	NPL42	BOWLES, R., <i>et al.</i> , "Long-chain n-3 Polyunsaturated Fatty Acid Production by Members of the Marine Protistan Group the Thraustochytrids: Screening of Isolates and Optimisation of Docosahexaenoic Acid Production" <i>J. Biotechnol.</i> 70:193-202, Elsevier, Netherlands (1999)	
	NPL43	CHEN, C. and CHOU, H., "Screening of Red Algae Filaments as a Potential Alternative Source of Eicosapentaenoic Acid" <i>Mar. Biotechnol.</i> 4:189-192, Springer-Verlag, United States (2002)	
	NPL44	COHEN, Z., "Production Potential of Eicosapentaenoic Acid by <i>Monodus subterraneus</i> " <i>J. Am. Oil Chem. Soc.</i> 71:941-945, American Oil Chemists Society, United States (1994)	
	NPL45	FAN, K., <i>et al.</i> , "Lipid Characterization of Mangrove Thraustochytrid ~ <i>Schizochytrium mangrovei</i> " <i>J. Agric. Food Chem.</i> 55:2906-2910, American Chemical Society, United States (2007)	
	NPL46	FERNÁNDEZ, F., <i>et al.</i> , "Modeling of Eicosapentaenoic Acid (EPA) Production from <i>Phaeodactylum tricornutum</i> Cultures in Tubular Photobioreactors. Effects of Dilution Rate, Tube Diameter, and Solar Irradiance" <i>Biotechnol. Bioeng.</i> 68:173-183, Wiley, United States (2000)	
	NPL47	JIANG, Y., <i>et al.</i> , "Fatty Acid Composition and Squalene Content of the Marine Microalga <i>Schizochytrium mangrovei</i> " <i>J. Agric. Food Chem.</i> 52: 1196-1200, American Chemical Society, United States (2004)	
	NPL48	KAMLANGDEE, N. and Fan, K.W., "Polyunsaturated Fatty Acids Production by <i>Schizochytrium sp.</i> Isolated from Mangrove," <i>Songklanakarin J. Sci. Technol.</i> 25:643-650, Prince of Songkla University, Thailand (2003)	
	NPL49	KIY, T., <i>et al.</i> , "Production of Docosahexaenoic Acid by the Marine Microalga, <i>Ulkenia sp.</i> " in <i>Single Cell Oils</i> , Ratledge, C. and Cohen Z., eds., American Oil Chemists Society Publishing, United States, pp. 99-106 (2005)	
	NPL50	LI, Z. and WARD, O., "Production of Docosahexaenoic Acid by <i>Thraustochytrium roseum</i> " <i>J. Ind. Microbiol.</i> 13:238-241, Elsevier Science, England (1994)	

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

¹ Applicant's unique citation designation number (optional). ² 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. /RK/

Substitute for form 1449/PTO		Complete if Known			
FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	12/407,687		
		Filing Date	March 19, 2009		
		First Named Inventor	APT <i>et al.</i>		
		Art Unit	1657		
		Examiner Name	KOSSON, Rosanne		
Sheet	2	of	2	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	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, page(s), volume number, publisher, city and/or country where published	T ²
	NPL51	MEIRELES, L., <i>et al.</i> , "Lipid Class Composition of the Microalga <i>Pavlova lutheri</i> : Eicosapentaenoic and Docosahexaenoic Acids" <i>J. Agric. Food Chem.</i> 51:2237-2241, American Chemical Society, United States (2003)	
	NPL52	SINGH, A. and WARD, O., "Microbial Production of Docosahexaenoic Acid (DHA, C22:6)" <i>Adv. Appl. Microbiol.</i> 45:271-312, Academic Press, United States (1997)	
	NPL53	WARD, O. and SINGH, A., "Omega-3/6 fatty acids: Alternative Sources of Production" <i>Proc. Biochem.</i> 40:3627-3652, Elsevier, United States (2005)	
	NPL54	WATANABE, K. <i>et al.</i> , "Production of ¹³ C-Labeled Docosahexaenoic Acid by a <i>Thraustochytrid</i> ," <i>J. Jpn. Oil Chem. Soc.</i> 49:1437-1441, Japan Oil Chemists Society, Japan (2000)	
	NPL55	WEN, Z. and CHEN, F., "Heterotrophic Production of Eicosapentaenoic Acid by Microalgae" <i>Biotechnol. Adv.</i> 21:273-294, Oxford, England (2003)	
	NPL56	XU, F., <i>et al.</i> , "Growth Characteristics and Eicosapentaenoic Acid Production by <i>Nannochloropsis</i> sp. in Mixotrophic Conditions" <i>Biotechnol. Lett.</i> 26:51-53, Kluwer Academic Publishers, Netherlands (2004)	
	NPL57	YOKOYAMA, R. and HONDA, D., "Taxonomic Rearrangement of the Genus <i>Schizochytrium</i> sensu lato Based on Morphology, Chemotaxonomic Characteristics, and 18S rRNA Gene Phylogeny (Thraustochytriaceae, Labyrinthulomycetes): emendation for <i>Schizochytrium</i> and Erection of <i>Aurantiochytrium</i> and <i>Oblongichytrium</i> gen. nov." <i>Mycoscience</i> 48:199-211, The Mycological Society of Japan and Springer, Japan (2007)	
	NPL58	Amendment and Response dated August 3, 2005 in U.S. Application No. 10/228,843, filed August 26, 2002, inventor Van Elswyk	

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Examiner Signature	/Rosanne Kosson/	Date Considered	02/06/2012
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² 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. /RK/

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 12/407,687		Filing Date 03/19/2009		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			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 \$250 (\$125 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			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			(Column 3)		SMALL ENTITY OR OTHER THAN SMALL ENTITY		
AMENDMENT	02/28/2012	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 48	Minus	** 62	= 0	X \$ =		OR	X \$60=	
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 13	= 0	X \$ =		OR	X \$250=	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0	
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>										
Legal Instrument Examiner: /MOLIKI MAY/										

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.

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Examiner Signature		Date Considered	
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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 2 hours 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, 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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Substitute for form 1449/PTO				Complete if Known	
FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Application Number	12/407,687
				Filing Date	March 19, 2009
				First Named Inventor	APT <i>et al.</i>
				Art Unit	1657
				Examiner Name	KOSSON, Rosanne
Sheet	1	of	2	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. ¹	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, page(s), volume-issue number(s), publisher, city and/or country where published	T ²	
	NPL41	BARCLAY, W., <i>et al.</i> , "Development of a Docosahexaenoic Acid Production Technology Using <i>Schizochytrium</i> : A Historical Perspective" in <i>Single Cell Oils</i> , Ratledge, C. and Cohen Z., eds., American Oil Chemists Society Publishing, United States, pp. 36-52 (2005)		
	NPL42	BOWLES, R., <i>et al.</i> , "Long-chain n-3 Polyunsaturated Fatty Acid Production by Members of the Marine Protistan Group the Thraustochytrids: Screening of Isolates and Optimisation of Docosahexaenoic Acid Production" <i>J. Biotechnol.</i> 70:193-202, Elsevier, Netherlands (1999)		
	NPL43	CHEN, C. and CHOU, H., "Screening of Red Algae Filaments as a Potential Alternative Source of Eicosapentaenoic Acid" <i>Mar. Biotechnol.</i> 4:189-192, Springer-Verlag, United States (2002)		
	NPL44	COHEN, Z., "Production Potential of Eicosapentaenoic Acid by <i>Monodus subterraneus</i> " <i>J. Am. Oil Chem. Soc.</i> 71:941-945, American Oil Chemists Society, United States (1994)		
	NPL45	FAN, K., <i>et al.</i> , "Lipid Characterization of Mangrove Thraustochytrid - <i>Schizochytrium mangrovei</i> " <i>J. Agric. Food Chem.</i> 55:2906-2910, American Chemical Society, United States (2007)		
	NPL46	FERNÁNDEZ, F., <i>et al.</i> , "Modeling of Eicosapentaenoic Acid (EPA) Production from <i>Phaeodactylum tricornutum</i> Cultures in Tubular Photobioreactors. Effects of Dilution Rate, Tube Diameter, and Solar Irradiance" <i>Biotechnol. Bioeng.</i> 68:173-183, Wiley, United States (2000)		
	NPL47	JIANG, Y., <i>et al.</i> , "Fatty Acid Composition and Squalene Content of the Marine Microalga <i>Schizochytrium mangrovei</i> " <i>J. Agric. Food Chem.</i> 52: 1196-1200, American Chemical Society, United States (2004)		
	NPL48	KAMLANGDEE, N. and Fan, K.W., "Polyunsaturated Fatty Acids Production by <i>Schizochytrium sp.</i> Isolated from Mangrove," <i>Songklanakarin J. Sci. Technol.</i> 25:643-650, Prince of Songkla University, Thailand (2003)		
	NPL49	KIY, T., <i>et al.</i> , "Production of Docosahexaenoic Acid by the Marine Microalga, <i>Ulkenia sp.</i> " in <i>Single Cell Oils</i> , Ratledge, C. and Cohen Z., eds., American Oil Chemists Society Publishing, United States, pp. 99-106 (2005)		
	NPL50	LI, Z. and WARD, O., "Production of Docosahexaenoic Acid by <i>Thraustochytrium roseum</i> " <i>J. Ind. Microbiol.</i> 13:238-241, Elsevier Science, England (1994)		

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

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 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 2 hours 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, 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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Substitute for form 1449/PTO		Complete if Known			
FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	12/407,687		
		Filing Date	March 19, 2009		
		First Named Inventor	APT <i>et al.</i>		
		Art Unit	1657		
		Examiner Name	KOSSON, Rosanne		
Sheet	2	of	2	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	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, page(s), volume number, publisher, city and/or country where published	T ²
	NPL51	MEIRELES, L., <i>et al.</i> , "Lipid Class Composition of the Microalga <i>Pavlova lutheri</i> : Eicosapentaenoic and Docosahexaenoic Acids" <i>J. Agric. Food Chem.</i> 51:2237-2241, American Chemical Society, United States (2003)	
	NPL52	SINGH, A. and WARD, O., "Microbial Production of Docosahexaenoic Acid (DHA, C22:6)" <i>Adv. Appl. Microbiol.</i> 45:271-312, Academic Press, United States (1997)	
	NPL53	WARD, O. and SINGH, A., "Omega-3/6 fatty acids: Alternative Sources of Production" <i>Proc. Biochem.</i> 40:3627-3652, Elsevier, United States (2005)	
	NPL54	WATANABE, K. <i>et al.</i> , "Production of ¹³ C-Labeled Docosahexaenoic Acid by a <i>Thraustochytrid</i> ," <i>J. Jpn. Oil Chem. Soc.</i> 49:1437-1441, Japan Oil Chemists Society, Japan (2000)	
	NPL55	WEN, Z. and CHEN, F., "Heterotrophic Production of Eicosapentaenoic Acid by Microalgae" <i>Biotechnol. Adv.</i> 21:273-294, Oxford, England (2003)	
	NPL56	XU, F., <i>et al.</i> , "Growth Characteristics and Eicosapentaenoic Acid Production by <i>Nannochloropsis</i> sp. in Mixotrophic Conditions" <i>Biotechnol. Lett.</i> 26:51-53, Kluwer Academic Publishers, Netherlands (2004)	
	NPL57	YOKOYAMA, R. and HONDA, D., "Taxonomic Rearrangement of the Genus <i>Schizochytrium</i> sensu lato Based on Morphology, Chemotaxonomic Characteristics, and 18S rRNA Gene Phylogeny (Thraustochytriaceae, Labyrinthulomycetes): emendation for <i>Schizochytrium</i> and Erection of <i>Aurantiochytrium</i> and <i>Oblongichytrium</i> gen. nov." <i>Mycoscience</i> 48:199-211, The Mycological Society of Japan and Springer, Japan (2007)	
	NPL58	Amendment and Response dated August 3, 2005 in U.S. Application No. 10/228,843, filed August 26, 2002, inventor Van Elswyk	

1470699_1.DOC

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

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 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 2 hours 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, 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 (1-800-786-9199) and select option 2.

Electronic Patent Application Fee Transmittal				
Application Number:		12407687		
Filing Date:		19-Mar-2009		
Title of Invention:		Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof		
First Named Inventor/Applicant Name:		Kirk E. APT		
Filer:		Katrina Y.Pei Quach/Lauren Harrison		
Attorney Docket Number:		2715.0030000/JUK/SAS		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
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:				
Request for continued examination	1801	1	930	930
Total in USD (\$)				930

Electronic Acknowledgement Receipt

EFS ID:	11953521
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Katrina Y.Pei Quach/Lauren Harrison
Filer Authorized By:	Katrina Y.Pei Quach
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	30-JAN-2012
Filing Date:	19-MAR-2009
Time Stamp:	17:01:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 930
RAM confirmation Number	4597
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Miscellaneous Incoming Letter		1	2	
	Request for Continued Examination (RCE)		3	3	
	Oath or Declaration filed		4	15	
	Amendment Submitted/Entered with Filing of CPA/RCE		16	19	
	Transmittal Letter		20	22	
	Information Disclosure Statement (IDS) Form (SB08)		23	25	
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Information:					
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Information:					
3	Non Patent Literature	NPL_42.pdf	275250 0c9ac5a3759f0043ad87ae1688cea0b33436b424	no	10
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Information:					
4	Non Patent Literature	NPL_43.pdf	150961 f239cab879294ca862e226a6a4948e38ca2d4277	no	4
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Information:					
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17	Non Patent Literature	NPL_56.pdf	67049 93a4fd13925f907886d8f6f4c0821e03b9b4913a	no	3
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19	Non Patent Literature	NPL_58.pdf	634316 7020317bbbed01eb95cd1c0d5065b8024abacdb5	no	14
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Warnings:					
Information:					
Total Files Size (in bytes):			13797032		
<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>					

KATRINA QUACH
ASSOCIATE*
(202) 772-8963
KQUACH@SKGF.COM



January 30, 2012

Commissioner for Patents
PO Box 1450
Alexandria, VA22313-1450

Confirmation No. 7806
Art Unit 1657
Attn: Mail Stop RCE

Re: U.S. Utility Patent Application
Application No. 12/407,687; Filing Date: March 19, 2009
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making
and Uses Thereof**
Inventors: APT *et al.*
Our Ref:2715.0030000/JUK/SAS/KPQ

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Online Credit Card Payment Authorization in the amount of \$930.00 to cover Request for Continued Examination Fee;
2. Request for Continued Examination (RCE) Transmittal;
3. Supplemental Declaration (3 copies);
4. Reply Under 37 C.F.R. § 1.114 and Statement of Substance of the Interview;
5. First Supplemental Information Disclosure Statement;
6. Form PTO/SB/08a equivalent (1 sheet) listing 6 documents (US91-US96);
7. Form PTO/SB/08b equivalent (2 sheets) listing 18 documents (NPL41-NPL58); and
8. Copies of cited documents (NPL41-NPL58).

The above-listed documents are filed electronically through EFS-Web.

In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

Commissioner for Patents
January 30, 2012
Page 2

Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Katrina Quach
Attorney for Applicants
Registration No. 51,063

JUK/SAS/KPQ/leh
Enclosures

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*Admitted only in Maryland

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	12/407,687
Filing Date	March 19, 2009
First Named Inventor	Kirk E. APT
Art Unit	1657
Examiner Name	KOSSON, Rosanne
Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

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. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. **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 order 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).

- a. ☐ 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.
- i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ii. ☐ Other _____
- b. ☒ Enclosed
- i. ☒ Amendment/Reply
- ii. ☐ Affidavit(s)/ Declaration(s)
- iii. ☒ Information Disclosure Statement (IDS)
- iv. ☐ Other _____

2. Miscellaneous

- a. ☐ 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)
- b. ☐ Other _____

3. 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 the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 19-0036.
- a. ☒ RCE fee required under 37 CFR 1.17(e)
- ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)
- iii. ☐ Other _____
- b. ☐ Check in the amount of \$ _____ enclosed
- c. ☐ Payment by credit card (Form PTO-2038 enclosed)

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.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature		Date	January 30, 2012
Name (Print/Type)	Katrina Quach	Registration No.	51,063

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature		Date	
Name (Print/Type)			

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 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 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: Mail Stop RCE, 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. 1472851

Supplemental Declaration for Patent Application

Atty. Docket No. 2715.0030000/JUK/SAS

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter that is claimed and for which a patent is sought on the invention entitled **Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof**, the specification of which is attached hereto unless the following box is checked:

- ☒ was filed on March 19, 2009;
as United States Application Number or PCT International Application Number
12/407,687; and
was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Authorization to Permit Access to Application by Participating Offices

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO or other intellectual property office in which a foreign application claiming priority to the above-identified application is filed to have access to the application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the application-as-filed with respect to: 1) the above-identified application, 2) any foreign application to which the above-identified application claims priority under 35 USC 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified US application, and 3) any U.S. application from which benefit is sought in the above-identified application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

Claim of Foreign Priority Benefits

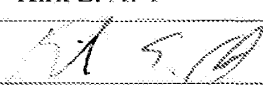
I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or (f) or § 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or § 365(a) of any PCT international application, which designated at least one country other than the United States of America, listed below, and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed		Certified Copy Attached?	
					YES	NO
			☐		☐	☐
			☐		☐	☐
			☐		☐	☐
			☐		☐	☐

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first Inventor:	Kirk E. APT
Signature of first Inventor:	 Date: 12/28/11
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	3874 Paul Mill Road Ellicott City, Maryland 21042

Full name of second Inventor:	Joseph W. PFEIFER III
Signature of second Inventor:	Date:
Residence:	Westminster, Maryland
Citizenship:	US
Mailing Address:	776 Nadines Court Westminster, Maryland 21157

Full name of third Inventor:	Jon Milton HANSEN
Signature of third Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	2776 Turf Valley Golf Road #775 Ellicott City, Maryland 21042

Full name of fourth Inventor:	Paul Warren BEHRENS
Signature of fourth Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	11413 Butterfruit Way Ellicott City, Maryland 21042

Full name of fifth Inventor:	Ross ZIRKLE
Signature of fifth Inventor:	Date:
Residence:	Mt. Airy, Maryland
Citizenship:	US
Mailing Address:	2108 Huntington Terrace Mt. Airy, MD 21771

Full name of sixth Inventor:	Tracey Lynn STAHL
Signature of sixth Inventor:	Date:
Residence:	Pasadena, Maryland
Citizenship:	US
Mailing Address:	1016 Tennant Harbour Pasadena, Maryland 21122

963243_1.DOC

Supplemental Declaration for Patent Application

Atty. Docket No. 2715.0030000/JUK/SAS

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter that is claimed and for which a patent is sought on the invention entitled **Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof**, the specification of which is attached hereto unless the following box is checked:

☒ was filed on March 19, 2009;
as United States Application Number or PCT International Application Number
12/407,687; and
was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Authorization to Permit Access to Application by Participating Offices

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO or other intellectual property office in which a foreign application claiming priority to the above-identified application is filed to have access to the application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the application-as-filed with respect to: 1) the above-identified application, 2) any foreign application to which the above-identified application claims priority under 35 USC 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified US application, and 3) any U.S. application from which benefit is sought in the above-identified application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

Claim of Foreign Priority Benefits

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or (f) or § 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or § 365(a) of any PCT international application, which designated at least one country other than the United States of America, listed below, and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

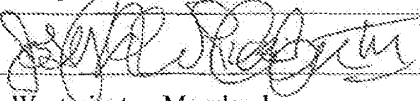
Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

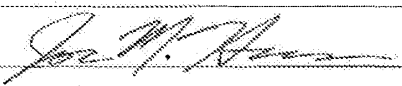
Send Correspondence to: Customer No. 91335

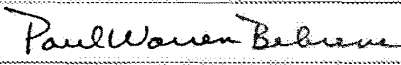
Direct Telephone Calls to: (202) 371-2600

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first Inventor:	Kirk E. APT
Signature of first Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	3874 Paul Mill Road Ellicott City, Maryland 21042

Full name of second Inventor:	Joseph W. PFEIFER III
Signature of second Inventor:	 Date: 12/21/11
Residence:	Westminster, Maryland
Citizenship:	US
Mailing Address:	776 Nadines Court Westminster, Maryland 21157

Full name of third Inventor:	Jon Milton HANSEN
Signature of third Inventor:	 Date: 12/21/11
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	2776 Turf Valley Golf Road #775 Ellicott City, Maryland 21042

Full name of fourth Inventor:	Paul Warren BEHRENS
Signature of fourth Inventor:	 Date: 12/21/11
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	11413 Butterfruit Way Ellicott City, Maryland 21042

Full name of fifth Inventor:	Ross ZIRKLE
Signature of fifth Inventor:	Date:
Residence:	Mt. Airy, Maryland
Citizenship:	US
Mailing Address:	2108 Huntington Terrace Mt. Airy, MD 21771

Full name of sixth Inventor:	Tracey Lynn STAHL
Signature of sixth Inventor:	Date: 12/21/11
Residence:	Pasadena, Maryland
Citizenship:	US
Mailing Address:	1016 Tennant Harbour Pasadena, Maryland 21122

963243_1.DOC

Supplemental Declaration for Patent Application

Atty. Docket No. 2715.0030000/JUK/SAS

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter that is claimed and for which a patent is sought on the invention entitled **Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof**, the specification of which is attached hereto unless the following box is checked:

☒ was filed on March 19, 2009;
as United States Application Number or PCT International Application Number
12/407,687; and
was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Authorization to Permit Access to Application by Participating Offices

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO or other intellectual property office in which a foreign application claiming priority to the above-identified application is filed to have access to the application.

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In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

Claim of Foreign Priority Benefits

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or (f) or § 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or § 365(a) of any PCT international application, which designated at least one country other than the United States of America, listed below, and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

Send Correspondence to: Customer No. 91335

Direct Telephone Calls to: (202) 371-2600

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first Inventor:	Kirk E. APT
Signature of first Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	3874 Paul Mill Road Ellicott City, Maryland 21042

Full name of second Inventor:	Joseph W. PFEIFER III
Signature of second Inventor:	Date:
Residence:	Westminster, Maryland
Citizenship:	US
Mailing Address:	776 Nadines Court Westminster, Maryland 21157

Full name of third Inventor:	Jon Milton HANSEN
Signature of third Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	2776 Turf Valley Golf Road #775 Ellicott City, Maryland 21042

Full name of fourth Inventor:	Paul Warren BEHRENS
Signature of fourth Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	11413 Butterfruit Way Ellicott City, Maryland 21042

Full name of fifth Inventor:	Ross ZIRKLE
Signature of fifth Inventor:	<i>Ross Zirkle</i> Date: <i>12 DEC 2011</i>
Residence:	Mt. Airy, Maryland
Citizenship:	US
Mailing Address:	2108 Huntington Terrace Mt. Airy, MD 21771

Full name of sixth Inventor:	Tracey Lynn STAHL
Signature of sixth Inventor:	Date:
Residence:	Pasadena, Maryland
Citizenship:	US
Mailing Address:	1016 Tennant Harbour Pasadena, Maryland 21122

963243_1.DOC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

APT *et al.*

Appl. No.: 12/407,687

Filed: March 19, 2009

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of
Making and Uses Thereof**

Confirmation No.: 7806

Art Unit: 1657

Examiner: KOSSON, Rosanne

Atty. Docket: 2715.0030000/JUK/SAS/KPQ

Reply Under 37 C.F.R. § 1.114 and Statement of Substance of the Interview

Mail Stop RCE

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

Sir:

In reply to the Office Action dated October 28, 2011, Applicants submit the following Remarks.

Statement of Substance of the Interview begins on page 2 of this paper.

Remarks begin on page 2 of this paper.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 19-0036.

Statement of Substance of the Interview

Applicants thank Examiner Rosanne Kosson and Supervisor Jon Weber for extending the courtesy of an in-person interview with Applicants' representatives Scott A. Schaller and Katrina Quach on December 5, 2011. During the interview, the rejections under 35 U.S.C. § 103(a) over US 2003/0060509 A1("Van Elswyk") were discussed. Supervisor Weber agreed that Van Elswyk does not disclose a microbial oil comprising a triglyceride fraction of at least 70% by weight, and Applicants' representatives were informed that the rejections under 35 U.S.C. § 103(a) over Van Elswyk will be withdrawn.

The Amendment and Response filed on August 3, 2005 during prosecution of the Van Elswyk application ("the Van Elswyk Response") was also discussed. Specifically, it was noted by Applicants' representatives that the third paragraph of the Remarks section at page 9 of the Van Elswyk Response makes clear that the term "70%" in paragraphs [0029], [0050], and [0063] in Van Elswyk refers only to the amount "of the desired HUFA" and does not refer to the amount of triglycerides. It was agreed that Applicants would consider filing a Request for Continued Examination with an Information Disclosure Statement citing the Van Elswyk Response.

Remarks

Claims 51-99 are pending in the application, with claims 51, 53, 54, 66-69, 71-74, 76, and 78 being the independent claims. Claims 61-99 have been withdrawn pursuant to the Office Action of July 13, 2011. Claims 1-50 were previously canceled

Atty. Dkt. No. 2715.0030000/JUK/SAS/KPQ

without prejudice to or disclaimer of the subject matter therein. Applicants reserve the right to pursue any of the canceled subject matter.

I. Rejections under 35 U.S.C. § 103

Claims 51-54 and 57-60 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Van Elswyk. Claims 51-55 and 57-60 were rejected as allegedly being unpatentable over Van Elswyk in view of US 6,399,803 B1 ("Corley *et al.*"). Applicants thank the Examiner for indicating in the Office's Interview Summary dated December 8, 2011 that the rejections under 35 U.S.C. § 103(a) will be withdrawn. As such, Applicants have not provided any additional traversal of the rejections over that previously made in Applicants' Amendment and Reply filed on October 13, 2011.

II. Supplemental Information Disclosure Statement

Applicants file herewith a Supplemental Information Disclosure Statement citing the Amendment and Reply filed on August 3, 2005 in the Van Elswyk application, as discussed during the interview of December 5, 2011.

III. Provisional Obviousness-Type Double Patenting Rejections

Claims 51-60 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 24-35 of co-pending Appl. No. 12/729,013 and claims 39, 41-42, 44-47 and 49-57 of co-pending Appl. No. 13/151,014.

Applicants respectfully request that these double patenting rejections be held in abeyance until allowable subject matter in the present application or the cited co-pending applications is indicated.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the Office Action and, as such, 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.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Katrina Quach
Attorney for Applicants
Registration No. 51,063

Date: January 30, 2012

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

1454794_1.DOCX

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

APT *et al.*

Appl. No.: 12/407,687

Filed: March 19, 2009

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of
Making and Uses Thereof**

Confirmation No.: 7806

Art Unit: 1657

Examiner: KOSSON, Rosanne

Atty. Docket: 2715.0030000/JUK/SAS/KPQ

First Supplemental Information Disclosure Statement

Mail Stop Amendment

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

Sir:

Listed on accompanying IDS Forms PTO/SB/08a equivalent and PTO/SB/08b equivalent are documents that may be considered material to the patentability of this application as defined in 37 C.F.R. §1.56, and in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.97 and 1.98. The numbering on this First Supplemental Information Disclosure Statement is a continuation of the numbering in Applicants' Information Disclosure Statement filed on October 13, 2011 in connection with the above-captioned application.

Copies of documents **NPL41–NPL58** are submitted. However, in accordance with 37 C.F.R. § 1.98(a)(2), no copies of U.S. patents or U.S. patent application publications cited as documents **US91-US96** on the attached IDS Forms are submitted.

Where the publication date of a listed document does not provide a month of publication, the year of publication of the listed document is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the month of publication is

not in issue. Applicants have listed publication dates on the attached IDS Forms based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

This Information Disclosure Statement is being filed concurrently with the filing of a Request for Continued Examination under 37 C.F.R. § 1.114 and before the mailing of a first Office Action. No statement or fee is required.

It is respectfully requested that the Examiner initial and return a copy of the enclosed IDS Forms, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Katrina Quach
Attorney for Applicants
Registration No. 51,063

Date: January 30, 2012

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600
1470975_1

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 12/407,687		Filing Date 03/19/2009		☒ To be Mailed	
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APPLICATION AS FILED – PART I						OTHER THAN SMALL ENTITY			
(Column 1)		(Column 2)		SMALL ENTITY ☐		OR		SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)	
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A		N/A		N/A		
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A		N/A		N/A		
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A		N/A		N/A		
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$	=	OR	X \$	=		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=	OR	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 \$250 (\$125 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))									
			TOTAL			TOTAL			

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II						OTHER THAN SMALL ENTITY					
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR		SMALL ENTITY	
AMENDMENT	01/30/2012	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 49	Minus	** 62	=	0	OR	X \$60=	0		
	Independent (37 CFR 1.16(h))	* 10	Minus	*** 13	=	0	OR	X \$250=	0		
☐ Application Size Fee (37 CFR 1.16(s))											
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE		TOTAL ADD'L FEE	0		

(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR		SMALL ENTITY	
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	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	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.

Legal Instrument Examiner:
/LISA THOMAS/

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
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806
26111 7590 12/08/2011 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER KOSSON, ROSANNE	
			ART UNIT	PAPER NUMBER
			1657	
			MAIL DATE	DELIVERY MODE
			12/08/2011	PAPER

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.

<i>Applicant-Initiated Interview Summary</i>	Application No.	Applicant(s)	
	12/407,687	APT ET AL.	
	Examiner	Art Unit	
	ROSANNE KOSSON	1657	

All participants (applicant, applicant's representative, PTO personnel):

- (1) ROSANNE KOSSON. (3) Ms. Katrina Quach, Applicants' representative.
 (2) Mr. Scott Schaller, Applicants' representative. (4) Mr. Jon Weber, Supervisor.

Date of Interview: 05 December 2011.

Type: ☐ Telephonic ☐ Video Conference
☒ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
 If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☒Others
 (For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: those pending.

Identification of prior art discussed: that of record.

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The 103 rejections were discussed. Supervisor Weber agreed with Applicants' interpretation of the primary reference, van Elswyk (US 2003/0060509 A1), that the 70% minimum content (for the algal oil composition) refers to only the first item in the list of five, not to all five. See paragraphs 29, 50 and 63. Because van Elswyk is the closest prior art, the rejection will be withdrawn. Applicants noted that a Response in the van Elswyk case (App. No. 10/228843, now abandoned), dated 8/3/05, shows that the attorney in van Elswyk went on the record, interpreting the claims and spec to mean that the 70% refers to the first item only, the desired HUFA, not all five items. It was discussed that, because Applicants are after-final, an RCE should be filed to have this Response made of record, along with any other prior art that might clarify the instant claims or the prior art, particularly as van Elswyk and the instant application are both assigned to Martek. Applicants' representatives noted that they will discuss this matter with their client and will consider filing an RCE.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/Rosanne Kosson/
 Primary Examiner, Art Unit 1657

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent and Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806
26111 7590 10/28/2011 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER KOSSON, ROSANNE	
			ART UNIT 1657	PAPER NUMBER
			MAIL DATE 10/28/2011	DELIVERY MODE PAPER

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.

Office Action Summary	Application No. 12/407,687	Applicant(s) APT ET AL.
	Examiner ROSANNE KOSSON	Art Unit 1657
	-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 13 October 2011.

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

3) ☐ 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

4) ☒ Claim(s) 51-99 is/are pending in the application.

4a) Of the above claim(s) 61-99 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 51-60 is/are rejected.

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

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

Application Papers

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

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

 a) ☐ All b) ☐ Some * c) ☐ None of:

 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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>10/13/11</u> .	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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DETAILED ACTION

Applicants' Response filed on October 13, 2011 has been received and entered. Claims 51-56 and 59 have been amended. Claims 1-50 have been canceled. No claims have been added. In the previous Office action, claims 61-99 were withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to non-elected inventions, there being no allowable generic or linking claim. Accordingly, claims 51-60 are examined on the merits herewith.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112, second paragraph

In view of Applicants' amendments to the claims, the rejections in the previous Office action are withdrawn.

Claim Rejections - 35 USC § 103

In view of Applicants' amendments to the claims, the rejections in the previous Office action have been modified to mirror the amended claim set.

Claims 51-54 and 57-60 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Van Elswyk (US 2003/0060509 A1).

As discussed in the previous Office action, Van Elswyk discloses an infant formula comprising an oil that comprises HUFA's, including DHA, DPA and ARA. An infant formula is a food product and a beverage. 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

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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 an amount DPA that is within the claimed range (1-6% by weight). A ratio of 50% DHA to 3% DPA, as an example, is a ratio that is greater than 6:1. Quantities of heptadecanoic acid that are less than a particular value may be zero. The reference does not disclose that the oil contains heptadecanoic acid. Regarding ARA in the oil, Van Elswyk discloses that it is not necessary to add this fatty acid, because the combination of DHA and DPA maintains higher levels of tissue ARA and promotes its accumulation. See paragraphs 52 and 64. Thus, the amount of ARA may be zero, which is within the claimed range of less than 1.5% by weight. See claims 51-54, 57, 58 and 60.

Regarding claim 59, Van Elswyk discloses that cognitive and visual responses are improved in premature infants who are fed a formula containing HUFA's (see paragraph 43). Thus, the infant formula composition in the reference may be consumed by premature infants.

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.

Applicants assert that the claimed invention is not obvious, because they have interpreted paragraph 29 of the reference to mean that the highly purified algal oil contains at least one of five things and that, in Applicants' opinion, an algal oil comprising 70% or more of the desired HUFA and a triglyceride oil combined with phospholipid are two different things that are two of the five. In reply, Applicants' interpretation is not credible. An algal oil comprising 70% or more of the desired HUFA cannot be a different thing than the algal oil comprising 70%

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or more of at least one of the five things, one of which is the HUFA. The two are the same oil. Also, because paragraphs 29 and 63 (which was cited in the rejection) recite a highly purified algal oil, the 70% or more of at least one of the five following things refers to the algal oil. When the crude oil is made in fermentation, by culturing a heterotrophic microalga that produces such an oil, the oil is made in an amount on the order of g/L or tens of g/L, which might be 2% of the fermentation broth (assuming a high yield of 20 g/L of the oil). Thus, an algal oil comprising 70% of one of these items is a highly purified oil. Paragraphs 29 and 63 mean a purified algal oil comprising at least 70% of (1) a HUFA or (2) a triglyceride oil combined with phospholipid or (3) phospholipid or (4) protein and phospholipid or (5) dried marine algae. Under Applicants' interpretation, no quantities pertain to items 2-5. As a result, the algal oil would not be highly purified. The desired HUFA's are lipids, and these lipids are present in the lipid-rich fractions of the oil.

Applicants assert that the claimed invention is not obvious, because Van Elswyk does not disclose that her oil comprises at least 50% DHA and 0.5-6% DPA in the triglyceride fraction. Applicants assert that the reference discloses that 70-99% and 20-80% of the total fatty acids are DHA, while 1-20% of the total fatty acids are DPA(n-6). Applicants assert that the reference refers to the algal oil as a maternal supplement. In reply, a maternal supplement is an intended use of the algal oil. The reference discusses the benefits of giving this oil to pregnant women and lactating women in great detail. The reference also discloses other uses of the algal oil, such as a supplement for infant formula. But, the intended uses do not materially change the algal oil. As previously discussed, if the oil contains 70% triglycerides, and if 20-80% or 70-99% of the fatty acids in the algal oil are DHA, then the DHA content of the triglyceride fraction will be at least 50%. That is, if most of the fatty acids are DHA, because a triglyceride is a glycerol ester having three fatty acid chains linked by ester linkages, most of the

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content of the triglyceride fraction is fatty acid chains, and most of the fatty acids are DHA. Consequently, the fatty acid content that is DHA is more than 50% of the triglyceride fraction. As for DPA(n-6), if 1-20% of the fatty acids in the algal oil are DPA(n-6), then the fatty acid content of the triglyceride fraction, which is 70% or more of the total oil, will have approximately 1-20% of the fatty acids as DPA(n-6). This range overlaps substantially with the claimed range. The triglyceride fraction is where the fatty acids are predominantly located, particularly when the triglyceride fraction is 70% or more of the total.

Claims 51-55 and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Elswyk (US 2003/0060509 A1) in view of Corley et al. (US 6,399,803 B1). The teachings of Van Elswyk are disclosed above.

As previously discussed, regarding claim 55, Van Elswyk does not disclose that the triglyceride fraction contains at least 20% of a triglyceride that has DHA residues at the sn-1 and sn-2 positions. Corley et al. disclose that a triglyceride containing DHA at two adjacent positions on the glycerol backbone, the compound of Formula I, is the most important triglyceride in algal oil (from a golden marine microalga). This triglyceride is beneficial in treating cardiovascular disease and inflammatory diseases and may be added to infant formula to promote brain and retinal development and health (see col. 1, line 42, to col. 2, line 55; col. 3, lines 3-17; col. 4, lines 18-28; col. 5, lines 25-48; and Examples 1-2 in cols. 12-14). Corley et al. do not disclose the stereochemistry of the compound of Formula I. The terminal DHA residue may be at the sn-1 position or the sn-3 position, depending on the chirality of the second carbon in the glycerol backbone. But, Corley et al. disclose that DHA residues at the 1 and 2 positions, or at the 2 and 3 positions, yield a particularly valuable and therapeutic compound.

Consequently, it would have been obvious to the artisan of ordinary skill at the time of the invention to use a triglyceride fraction containing the triglyceride of Formula I of Corley et al.

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in the composition of Van Elswyk. Corley et al disclose that the predominant fatty acid in algal oil is DHA (40.9%), the second-most common being palmitic acid (22.8%), followed by DPA (16.2%). Thus, the artisan of ordinary skill at the time of the invention would have expected at least 20% of the triglycerides in the purified product of Corey et al. (derived from algal oil) to be those containing two DHA residues at the sn-1 and sn-2 positions.

Applicants have not argued the patentability of claim 55 separately from the patentability of the claims discussed above, unless it is Examiner's position that the algal oil of Corley et al. alone renders the claimed composition obvious. In reply, Corley et al. were cited for their teachings that it would have been obvious to use a triglyceride in which the fatty acid at the sn-1 and sn-2 positions is DHA, for at least 20% of the triglycerides in the triglyceride fraction in the composition of Van Elswyk. It is not the rejection that the claimed composition is obvious over Corley et al. alone.

In view of the foregoing, a holding of obviousness is again required.

Double Patenting- Obviousness-type

In view of Applicants' amendments to the claims, the rejections in the previous Office action have been modified to mirror the amended claim set.

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 obviousness-type 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*

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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); and *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 a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

With respect to the non-statutory double patenting rejection(s) made in this Office action, note as follows. The use of the terminology “defined in 35 U.S.C. §154 to §156 and §173” in a terminal disclaimer can result in the terminal disclaimer being found improper. To address this, note that a proper terminal disclaimer need only disclaim the patent’s remaining “full statutory term” as defined in 35 U.S.C., without specifying 35 U.S.C. 154 and 173. This is so, because the “full statutory term” inherently is a statutorily defined item. Note that the above language corresponds to PTO/SB/25 (07-09) (reproduced at page 1400-120 in Revision 7 (July 2008) of the 8th edition of the MPEP), but the reference to 35 U.S.C. 154 and 173 has been deleted.

Accordingly, the following language would be deemed acceptable:

The owner*, _____, of _____ percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number _____, filed on _____, and as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, “as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to

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the grant of any patent on the pending **reference** application,” in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Claims 51-60 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 24-35 of copending Application No.

12/729013. Although the conflicting claims 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 about” a particular amount, in which the fatty acid residues are predominantly DHA and in which little to none of the fatty acid residues are ARA. The dependent claims in each case recite a food product, such as an infant formula, comprising this oil. As previously discussed, the numerical ranges in the claims are not definite limitations and do not create different inventions. The instant claims have been amended to delete the word “about,” but the copending claims have not. Therefore, these inventions are not patentably distinct.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 51-60 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 39, 41, 42, 44-47 and 49-57 of copending Application No. 13/151014. Although the conflicting claims 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 a particular amount, in which the fatty acid residues are predominantly DHA and DPA, in the same ratio in each claim set, and in which little to none of the fatty acid residues are ARA. The copending dependent claims recite

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ingredients in the oil that need not be present, i.e., are below a particular level. The numerical ranges in the instant claims have been amended so that they are encompassed by the ranges in the copending claims. Consequently the numerical ranges in the two claim sets do not create different inventions. Therefore, these inventions are not patentably distinct.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Applicants have declined to respond to the double patenting rejections, requesting that they be postponed. In reply, if these rejections are not addressed and overcome, the application cannot proceed to the stage where Applicants could receive an indication of allowable subject matter. The rejections must be addressed at this point in time. The rejections are therefore maintained.

Claim 56 is free of the prior art. No claim is allowed.

Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicants are 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.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSANNE KOSSON whose telephone number is (571)272-2923. The examiner can normally be reached on Mon., Thurs., Fri., 8:30-6:00, Tues., 8:30-2:00, Wed. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. 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.

/Rosanne Kosson/
Primary Examiner, Art Unit 1652
2011-10-24

d his

(FILE 'HOME' ENTERED AT 16:51:03 ON 21 OCT 2011)

FILE 'CAPLUS, BIOSIS' ENTERED AT 16:51:29 ON 21 OCT 2011
L1 458 S TRIGLYCERIDE (40N) (DHA OR DOCOSAHEXAENOIC)
L2 5 S L1(40N) (DPA OR DPAN-6 OR DOCOSAPENTAENOIC)
L3 5 S L1(40N) (DPA#### OR DOCOSAPENTAENOIC)
L4 5 DUP REM L3 (0 DUPLICATES REMOVED)

=> app. no. 12/407687

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1176	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 16:38
L2	70	near40 (dpa or dpa(n-6) or docosapentaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 16:39
L3	56	S2 and @ad<"20090319"	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/10/21 16:40
S1	10	7163811 7252979 7871809 7824892 7829129 7745183 7732170 7579174).pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 16:48
S2	57	6812009 6372460 7897391 7629450 7718431 7560539 7897392 7799564 7879608 7897393 7902427 7902427 7906706 7601522 7803620 7626009 7217856).pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 16:58
S3	1107	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:06
S4	66	S3 near40 (docosapentaenoic or dpa)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:08
S5	26	S4 near40 oil	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:08
S6	21	S5 and @ad<"20090319"	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:12
S7	1107	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 18:38
S8	66	S7 near40 (docosapentaenoic or dpa)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 18:38
S9	26	S8 near40 oil	US-PGPUB; USPAT;	ADJ	ON	2011/07/07 18:38

			EPO, JPO, DERWENT			
S10	21	S9 and @ad< '20090319"	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S11	2	"7588791".pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 14:35
S12	2	"7588791".pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 14:36
S13	8	(6509178 6905850 20040059142).pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 15:40
S14	597	martek as.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:27
S15	137	S14 and triglyceride	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:27
S16	111	S15 and dha	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:27
S17	75	S16 and dpa	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:28
S18	73	S17 and oil	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:28
S19	47	S18 and formula	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/11 09:28
S20	2	("20030080509").pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/10/20 14:33
S21	173	("20010041358" "20020001833" "20020026063" "20020123111" "20030143659" "20030161864" "20030180898" "20040067574" "20040161831" "20040203120" "20040236128" "20050019880" "20050129831" "20050170479" "20050202148" "20050287651" "20060110806" "20060115881" "20060141592" "20060286648" "20070003686" "20070015263" "20070148315" "20070269507" "20070299134" "20080009045" "20080020033" "20080026103" "20080032353" "20080038789" "20080076164" "20080107791" "20080166781" "20080199923" "20080234377" "20080292681" "20090004219" "20090011012" "20090093543" "20090099261" "20090192304" "20090304784" "20100099765" "20100130610" "20100167359" "20100178369" "20100266564" "20100285105" "20110177031" "4485173" "4916066" "5130242" "5244921" "5246841" "5314812" "5340594" "5340742" "5401646" "5547699" "5698244" "6180376" "6248909" "6255505" "6372460" "6410282" "6441208" "6451567" "6461839" "6509178" "6566123" "6579714" "6582941" "6596766" "6607900" "6677470" "6727373" "6746857" "6783951" "6812009" "6844021" "6846942" "7005280" "7011962" "7022512" "7259006" "7514244" "7709236" "7723386" "7767427" "7863026").PN.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/10/21 09:16
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EAST Search History (Interference)

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Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Application Number	12/407,687
				Filing Date	March 19, 2009
				First Named Inventor	Kirk E. APT
				Art Unit	1652
				Examiner Name	KOSSON, Rosanne
Sheet	1	of	4	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If Known)			
	US1	4,485,173	11-27-1984	Gierhart	
	US2	4,916,066	04-10-1990	Akimoto <i>et al.</i>	
	US3	5,130,242	07-14-1992	Barclay	
	US4	5,244,921	09-14-1993	Kyle <i>et al.</i>	
	US5	5,246,841	09-21-1993	Yazawa <i>et al.</i>	
	US6	5,314,812	05-24-1994	Akimoto <i>et al.</i>	
	US7	5,340,594	08-23-1994	Barclay	
	US8	5,340,742	08-23-1994	Barclay	
	US9	5,401,646	03-28-1995	Shinmen <i>et al.</i>	
	US10	5,547,699	08-20-1996	Iizuka <i>et al.</i>	
	US11	5,698,244	12-16-1997	Barclay	
	US12	6,180,376 B1	01-30-2001	Liddell	
	US13	6,248,909 B1	06-19-2001	Akimoto <i>et al.</i>	
	US14	6,255,505 B1	07-03-2001	Bijl <i>et al.</i>	
	US15	6,372,460 B1	04-16-2002	Gladue <i>et al.</i>	
	US16	6,410,282 B1	06-25-2002	Kumar <i>et al.</i>	
	US17	6,441,208 B2	08-27-2002	Bijl <i>et al.</i>	
	US18	6,451,567 B1	09-17-2002	Barclay	
	US19	6,461,839 B2	10-08-2002	Yokochi <i>et al.</i>	
	US20	6,509,178 B1	01-21-2003	Tanaka <i>et al.</i>	

FOREIGN PATENT DOCUMENTS					
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		Country Code ³ Number ⁴ Kind Code ⁵ (if known)			
	FP1	EP 0 252 716 B1	01-13-1988	Suntory Limited	
	FP2	EP 0 273 708 B1	07-06-1988	Sagami Chemical Research Center	
	FP3	EP 0 521 104 B1	01-07-1993	Martek Corporation	
	FP4	EP 0 512 997 B1	11-19-1992	OmegaTech Inc.	
	FP5	EP 0 669 809 B1	09-06-1995	Omegatech, Inc.	
	FP6	EP 0 823 475 A1	02-11-1998	Japan as represented by Director-General, Agency of Industrial Science and Technology; Nagase Biochemicals, Ltd.; Suntory Limited	
	FP7	EP 0 894 142 B1	02-03-1999	DSM IP Assets B.V.	

Examiner Signature	Date Considered
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	US21	6,566,123 B1	05-20-2003	Barclay	
	US22	6,579,714 B1	06-17-2003	Hirabayashi <i>et al.</i>	
	US23	6,582,941 B1	06-24-2003	Yokochi <i>et al.</i>	
	US24	6,596,766 B1	07-22-2003	Igarashi <i>et al.</i>	
	US25	6,607,900 B2	08-19-2003	Bailey <i>et al.</i>	
	US26	6,677,470 B2	01-13-2004	Saebo <i>et al.</i>	
	US27	6,727,373 B2	04-27-2004	Bijl <i>et al.</i>	
	US28	6,746,857 B1	06-08-2004	Higashiyama <i>et al.</i>	
	US29	6,783,951 B2	08-31-2004	Long, II	
	US30	6,812,009 B2	11-02-2004	Gladue <i>et al.</i>	
	US31	6,844,021 B2	01-18-2005	Koike <i>et al.</i>	
	US32	6,846,942 B2	01-25-2005	Rubin	
	US33	7,005,280 B2	02-28-2006	Barclay	
	US34	7,011,962 B2	03-14-2006	Barclay	
	US35	7,022,512 B2	04-04-2006	Barclay	
	US36	7,259,006 B2	08-21-2007	Komazawa <i>et al.</i>	
	US37	7,514,244 B2	04-07-2009	Tanaka <i>et al.</i>	
	US38	7,709,236 B2	05-04-2010	Akimoto <i>et al.</i>	
	US39	7,723,386 B2	05-25-2010	Akimoto <i>et al.</i>	
	US40	7,767,427 B2	08-03-2010	Akimoto <i>et al.</i>	
	US41	7,863,026 B2	01-04-2011	Komazawa <i>et al.</i>	
	US42	2001/0041358 A1	11-15-2001	Yokochi <i>et al.</i>	
	US43	2002/0001833 A1	01-03-2002	Ruecker <i>et al.</i>	

FOREIGN PATENT DOCUMENTS					
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	FP8	EP 1 276 891 B1	01-22-2003	Council of Scientific and Industrial Research	
	FP9	EP 1 818 410 A1	08-15-2007	Suntory Limited	
	FP10	WO 02/092540 A1	11-21-2002	Martek Biosciences Boulder Corporation	
	FP11	WO 2007/006078 A1	01-18-2007	Adelaide Research and Innovation PTY Ltd	
	FP12	WO 2007/068997 A2	06-21-2007	Avestha Gengraine Technologies PVT.LTD.	

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		Filing Date	March 19, 2009		
		First Named Inventor	Kirk E. APT		
		Art Unit	1652		
		Examiner Name	KOSSON, Rosanne		
Sheet	3	of	4	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

U.S. PATENT DOCUMENTS						
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		Number-Kind Code ² (If Known)				
	US44	2002/0026063 A1	02-28-2002	Luthria		
	US45	2002/0123111 A1	09-05-2002	Gladue <i>et al.</i>		
	US46	2003/0143659 A1	07-31-2003	Bijl <i>et al.</i>		
	US47	2003/0161864 A1	08-28-2003	Tanaka <i>et al.</i>		
	US48	2003/0180898 A1	09-25-2003	Bailey <i>et al.</i>		
	US49	2004/0067574 A1	04-08-2004	Bijl <i>et al.</i>		
	US50	2004/0161831 A1	08-19-2004	Komazawa <i>et al.</i>		
	US51	2004/0203120 A1	10-14-2004	Kumar <i>et al.</i>		
	US52	2004/0236128 A1	11-25-2004	Rubin		
	US53	2005/0019880 A1	01-27-2005	Raghukumar <i>et al.</i>		
	US54	2005/0129831 A1	01-16-2005	Fabritius		
	US55	2005/0170479 A1	08-04-2005	Weaver <i>et al.</i>		
	US56	2005/0202148 A1	09-15-2005	Streekstra <i>et al.</i>		
	US57	2005/0287651 A1	12-29-2005	Akimoto <i>et al.</i>		
	US58	2006/0110806 A1	05-25-2006	Damude <i>et al.</i>		
	US59	2006/0115881 A1	06-01-2006	Damude <i>et al.</i>		
	US60	2006/0141592 A1	06-29-2006	Sumida <i>et al.</i>		
	US61	2006/0286648 A1	12-21-2006	Bailey <i>et al.</i>		
	US62	2007/0003686 A1	01-04-2007	Fichtali <i>et al.</i>		
	US63	2007/0015263 A1	01-18-2007	Wumpelmann		
	US64	2007/0148315 A1	06-28-2007	Schaap <i>et al.</i>		
	US65	2007/0269507 A1	11-22-2007	Sachetto <i>et al.</i>		
	US66	2007/0299134 A1	12-27-2007	Miller <i>et al.</i>		
	US67	2008/0009045 A1	01-10-2008	Komazawa <i>et al.</i>		
	US68	2008/0020033 A1	01-24-2008	Kawashima <i>et al.</i>		
	US69	2008/0026103 A1	01-31-2008	Fichtali <i>et al.</i>		
	US70	2008/0032353 A1	02-07-2008	Behrens <i>et al.</i>		
	US71	2008/0038789 A1	02-14-2008	Higashiyama		
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		Country Code ³ Number ² Kind Code ² (if known)				
	FP13	WO 2007/069078 A2	06-21-2007	Ocean Nutrition Canada Ltd.		
	FP14	WO 2008/067605 A1	06-12-2008	Biomass Research & Refining Pty Ltd.		

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	US72	2008/0076164 A1	03-27-2008	Ciprus <i>et al.</i>	
	US73	2008/0107791 A1	05-08-2008	Fichtali <i>et al.</i>	
	US74	2008/0166781 A1	07-10-2008	Higashiyama <i>et al.</i>	
	US75	2008/0199923 A1	08-21-2008	Barclay	
	US76	2008/0234377 A1	09-25-2008	Ellis	
	US77	2008/0292681 A1	11-27-2008	Domingo Pedrol <i>et al.</i>	
	US78	2009/0004219 A1	01-01-2009	Kallenmareth <i>et al.</i>	
	US79	2009/0011012 A1	01-08-2009	Baum	
	US80	2009/0093543 A1	04-09-2009	Xue <i>et al.</i>	
	US81	2009/0099261 A1	04-16-2009	Bell <i>et al.</i>	
	US82	2009/0192304 A1	07-30-2009	Roessler <i>et al.</i>	
	US83	2009/0304784 A1	12-10-2009	Mane <i>et al.</i>	
	US84	2010/0130610 A1	05-27-2010	Keller <i>et al.</i>	
	US85	2010/0167359 A1	07-01-2010	Katano <i>et al.</i>	
	US86	2010/0178369 A1	07-15-2010	Arledge <i>et al.</i>	
	US87	2010/0266564 A1	10-21-2010	Apt <i>et al.</i>	
	US88	2010/0285105 A1	11-11-2010	Radianingtyas	
	US89	2010/0099765 A1	04-22-2010	Chilton <i>et al.</i>	
	US90	2011/0177031 A1	07-21-2011	Apt <i>et al.</i>	
	US91				
	US92				
	US93				
	US94				
	US95				
	US96				

FOREIGN PATENT DOCUMENTS					
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	FP15	WO 2010/097809 A2	09-02-2010	V.B. Medicare Pvt. Ltd.	
	FP16	WO 2010/119319 A1	10-21-2010	Pronova Biopharma Norge AS	

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Examiner Signature	/Rosanne Kosson/	Date Considered	10/27/2011
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Sheet	1	of	5

NON PATENT LITERATURE DOCUMENTS			
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	NPL1	ASHFORD, A., <i>et al.</i> , "Electron Microscopy May Reveal Structure of Docosahexaenoic Acid-Rich Oil Within Schizochytrium sp." <i>Lipids</i> 12:1377-1386, AOCS Press, Germany (2000)	
	NPL2	BAJPAI, P., <i>et al.</i> , "Production of docosahexaenoic acid by <i>Thraustochytrium aureum</i> ," <i>Appl. Microbiol. Biotechnol.</i> 35:706-710, Springer-Verlag, Germany (1991)	
	NPL3	BAJPAI, P., <i>et al.</i> , "Optimization of Production of Docosahexaenoic Acid (DHA) by <i>Thraustochytrium aureum</i> ATCC 34304," <i>J. Am. Oil Chem. Soc.</i> 68(7):509-514, American Oil Chemists Society, United States (1991)	
	NPL4	BERGÉ, Jean-Pascal and BARNATHAN, Gilles, "Fatty-Acids from Lipids of Marine Organisms: Molecular Biodiversity, Roles as Biomarkers, Biologically Active Compounds, and Economical Aspects" <i>Adv Biochem Engin/Biotechnol</i> 96:49-125, Springer-Verlag, Germany (2005)	
	NPL5	BURJA, A.M., <i>et al.</i> , "Isolation and characterization of polyunsaturated fatty acid producing <i>Thraustochytrium</i> species: screening of strains and optimization of omega-3 production," <i>Appl. Microbiol Biotechnol.</i> 72(6):1161-1169, Springer-Verlag, Germany (2006)	
	NPL6	COHEN, Z., <i>et al.</i> , "Overproduction of γ -Linolenic and Eicosapentaenoic Acids by Algae," <i>Plant Physiol.</i> 98:569-572, American Society of Plant Biologists, United States (1992)	
	NPL7	FAN, <i>et al.</i> "Eicosapentaenoic and docosahexaenoic acids production by and okara-utilizing potential of thraustochytrids." <i>J Ind. Microbiol. Biotechnol.</i> 4:199-202, Springer, England (2001)	
	NPL8	GenBank AB022109.1 [online] <i>Thraustochytrium aggregatum</i> gene for 18S rRNA. 16 June 2001, accessed at http://www.ncbi.nlm.nih.gov/nuccore/5509888	
	NPL9	GOLDSTEIN, S. and BELSKY, M., "Axenic culture studies of a new marine phycomycete processing an unusual type of asexual reproduction," <i>Amer. Jour. Bot.</i> 51(1):72-78, Botanical Society Of America, United States (1964)	
	NPL10	HONDA, D., <i>et al.</i> , " <i>Schizochytrium limacinum</i> sp. nov., a new thraustochytrid from a mangrove area in the west Pacific Ocean," <i>Mycol. Res.</i> 102(4):439-448, Cambridge University Press for the British Mycological Society, England (1998)	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	12/407,687
		Filing Date	March 19, 2009
		First Named Inventor	Kirk E. APT
		Art Unit	1652
		Examiner Name	KOSSON, Rosanne
		Attorney Docket Number	2715.0030000/JUK/SAS/KPO
Sheet	2	of	5

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	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, page(s), volume number, publisher, city and/or country where published	T ²
	NPL11	HORROCKS, L.A. and YOUNG, K.Y., "Health benefits of docosahexaenoic acid (DHA)," <i>Pharmacol. Res.</i> 40(3):211-225, Academic Press, England (1999)	
	NPL12	HUANG, J., <i>et al.</i> , "Profile of Polyunsaturated Fatty Acids Produced by <i>Thraustochytrium</i> sp. KK17-3", <i>J. Am. Oil Chem. Soc.</i> 78(6): 605-610, AOCS Press, Germany (2001)	
	NPL13	HUANG, J., <i>et al.</i> , "Grouping Newly Isolated Docosahexaenoic Acid-Producing <i>Thraustochytrids</i> Based on Their Polyunsaturated Fatty Acid Profiles and Comparative Analysis of 18S rRNA Genes", <i>Mar. Biotechnol.</i> 5:450-457, Springer-Verlag, New York, Inc., United States (2003)	
	NPL14	IIDA, I. <i>et al.</i> , "Improvement of Docosahexaenoic Acid Production in a Culture of <i>Thraustochytrium aureum</i> by Medium Optimization" <i>J. Ferment. Bioeng.</i> 81(1):76-78, National Institute of Bio-science and Human Technology, Japan (1996)	
	NPL15	International Search Report with Written Opinion for International Application No. PCT/US2009/001720, European Patent Office, Netherlands, mailed on May 22, 2009	
	NPL16	KENDRICK, A. and RATLEDGE, C., "Lipids of Selected Molds Grown for Production of n-3 and n-6 Polyunsaturated Fatty Acids" <i>Lipids</i> 27(1):15-20, Springer, Germany (1992)	
	NPL17	LEWIS, T. <i>et al.</i> , "The Biotechnological Potential of <i>Thraustochytrids</i> " <i>Mar. Biotechnol.</i> 1:580-587, Springer-Verlag, New York, Inc., United States (1999)	
	NPL18	LEWIS, T., "Characterisation and application of Australian <i>thraustochytrids</i> ", Thesis submitted in fulfillment of the requirements of the degree of Doctor of Philosophy to The University of Tasmania, dated March 7, 2001, pp. i-169	
	NPL19	MO, C., <i>et al.</i> , "Development of a PCR strategy for <i>thraustochytrid</i> identification based on 18S rDNA sequence" <i>Marine Biology</i> 140:883-889, Springer, Germany (2002)	
	NPL20	PORTER, D., "Phylum Labyrinthulomycota," in <i>Handbook of Protoctista</i> , Margulis, L., Corliss, J.O., Melkonian, M., Chapman, D.J. (eds), Jones and Barlett, Boston, United States, pp. 388-398 (1989)	

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Sheet	3	of	5	Attorney Docket Number	2715.0030000/JUK/SAS/KPO
NON PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. ¹	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, page(s), volume-issue number(s), publisher, city and/or country where published			T ²
	NPL21	RAGAN, M.A., "Protistan parasite QPX of hard-shell clam <i>Mercenaria mercenaria</i> is a member of Labyrinthulomycota," <i>Dis. Aquat. Org.</i> 42:185-190, Inter-Research, Germany (2000)			
	NPL22	RAGHUKUMAR, S., "Thraustochytrid Marine Protists: Production of PUFAs and Other Emerging Technologies", <i>Mar. Biotechnol.</i> 10:631-640, Springer, Germany (August 2008)			
	NPL23	ROCHE, Helen M., "Unsaturated fatty acids" <i>Proceedings of the Nutrition Society</i> 58:397-401, Unit of Nutrition and Dietetics, Trinity Centre for Health Sciences, Republic of Ireland (1999)			
	NPL24	RYAN, A.S., <i>et al.</i> , "Clinical Overview of Algal-Docosahexaenoic Acid: Effects on Triglyceride Levels and Other Cardiovascular Risk Factors," <i>Am. J. Therap.</i> 16:183-192, Lippincott Williams & Wilkins, United States (March 2009)			
	NPL25	SIMOPOULOS, Artemis, "Omega-3 Fatty Acids in Inflammation and Autoimmune Diseases" <i>J. Am. Col.Nutr.</i> 21(6):495-505, American College of Nutrition, Washington, D.C., United States (2002)			
	NPL26	SINGH, A. <i>et al.</i> , "Docosahexaenoic acid (DHA) production by <i>Thraustochytrium</i> sp. ATCC 20892," <i>World J Microbiol. Biotechnol</i> 12:76-81, Rapid Science Publishers, United States (1996)			
	NPL27	SINGH, A. <i>et al.</i> , "Production of high yields of docosahexaenoic acid <i>Thraustochytrium roseum</i> ATCC 28210," <i>J Indust. Microbiol.</i> 16:370-373, Society for Industrial Microbiology, United States (1996)			
	NPL28	SINGH, Meharban, "Essential Fatty Acids, DHA and Human Brain" <i>Indian J. Pediatr.</i> 72:239-242 (2005)			
	NPL29	ULKEN, A., "Zwei neue Thraustochytrien aus der Außenwaser" <i>Veröffentlichungen des Institut für Meeresforschung in Bremerhaven, IX:</i> 289-295 (1965)			
	NPL30	English language translation of ULKEN, A., "Zwei neue Thraustochytrien aus der Außenwaser" <i>Veröffentlichungen des Institut für Meeresforschung in Bremerhaven, IX:</i> 289-295 (1965)			

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	NPL31	VAZHAPPILLY, R. and CHEN, F., "Eicosapentaenoic Acid and Docosaheptaenoic Acid Production Potential of Microalgae and Their Heterotrophic Growth," <i>J. Am. Oil Chem. Soc.</i> 75(3):393-397, AOCS Press, United States (1998)
	NPL32	YOKOYAMA, R., <i>et al.</i> , "Taxonomic rearrangement of the genus <i>Ulkenia</i> sensu lato based on morphology, chemotaxonomical characteristics, and 18S rRNA gene phylogeny (Thraustochytriaceae, Labryrinthulomycetes): emendation for <i>Ulkenia</i> and erection of <i>Botryochytrium</i> , <i>Parietichytrium</i> , and <i>Sicyoidochytrium</i> gen. nov." <i>Mycoscience</i> 48:329-341, The Mycological Society of Japan and Springer, Japan (2007)
	NPL33	YONGMANITCHAI, W., and WARD, O., "Omega-3 Fatty Acids: Alternative Sources of Production" <i>Process Biochemistry</i> 24:117-125, Elsevier, United States (1989)
	NPL34	ZELLER, S. <i>et al.</i> , "Production of Docosaheptaenoic Acid from Microalgae" <i>ACS Symposium Series</i> 788, 9:108-124, American Chemical Society (2001)
	NPL35	"Biofuel Development Shifting From Soil To Sea, Specifically To Marine Algae," <i>ScienceDaily</i> accessed at http://www.sciencedaily.com/releases/2008/12/081220084424.htm , published January 4, 2009
	NPL36	ATCC Certificate of Deposits for Strains 27173, 27173-C, 27173-E, and 27173-G, received January 07, 2009
	NPL37	BAHNWEG, G., "Final Report on the Identification of Thraustochytrid Strains MK27173 and MK27977" and Expert Qualifications of Dr. Gunther Bahnweg (October 2008)
	NPL38	LEANDER, C., "Evaluation of two thraustochytrid isolates, MK27173 and MK27977" and Expert Qualifications of Dr. Celeste Leander (July 2008)
	NPL39	Co-pending U.S. Application No. 13/220,259, inventors Apt <i>et al.</i> , filed August 29, 2011.

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				<i>Filing Date</i>	March 19, 2009
				<i>First Named Inventor</i>	Kirk E. APT
				<i>Art Unit</i>	1652
				<i>Examiner Name</i>	KOSSON, Rosanne
Sheet	5	of	5	<i>Attorney Docket Number</i>	2715.0030000/JUK/SAS/KPQ
	NPL40	Co-pending U.S. Application No. 13/151,014, inventors Cherinko <i>et al.</i> , filed June 1, 2011.			

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Examiner Signature	/Rosanne Kosson/	Date Considered	10/21/2011
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

APT *et al.*

Appl. No.: 12/407,687

Filed: March 19, 2009

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of
Making and Uses Thereof**

Confirmation No.: 7806

Art Unit: 1652

Examiner: KOSSON, Rosanne

Atty. Docket: 2715.0030000/JUK/SAS/KPQ

Amendment and Reply Under 37 C.F.R. § 1.111

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

Sir:

In reply to the Office Action dated July 13, 2011, Applicants submit the following Amendments and Remarks.

Amendments to the Claims begin on page 2.

Remarks begin on page 8.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendment to the Claims

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

1.- 50. (canceled)

51. (currently amended) A microbial oil comprising a triglyceride fraction of at least ~~about~~ 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least ~~about~~ 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from ~~about~~ 0.5% by weight to ~~about~~ 6% by weight, and wherein the oil comprises ~~about~~ 5% by weight or less of heptadecanoic acid.
52. (currently amended) The microbial oil of claim 51, further comprising an arachidonic acid content of the triglyceride fraction of ~~about~~ 1.5% or less by weight.
53. (currently amended) A microbial oil comprising a triglyceride fraction of at least ~~about~~ 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least ~~about~~ 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least ~~about~~ 0.5% by weight to ~~about~~ 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than ~~about~~ 6:1, and wherein the oil comprises ~~about~~ 5% by weight or less of heptadecanoic acid.
54. (currently amended) A microbial oil comprising a triglyceride fraction of at least ~~about~~ 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least ~~about~~ 60% by weight, and wherein the oil comprises ~~about~~ 5% by weight or less of heptadecanoic acid.
55. (currently amended) The microbial oil of any one of claims 51 to 54, wherein at least ~~about~~ 20% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions.

56. (currently amended) The microbial oil of any one of claims 51 to 54, wherein at least ~~about~~ 5% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at all three of the *sn*-1, *sn*-2, and *sn*-3 positions in the triglyceride.
57. (previously presented) A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the microbial oil of any one of claims 51 to 54.
58. (previously presented) The food product of claim 57, wherein the food product is an infant formula.
59. (currently amended) The food product of claim 58, wherein the infant formula ~~is suitable for~~ can be consumed by premature infants.
60. (previously presented) The food product of claim 57, wherein the food product is milk, a beverage, a therapeutic drink, a nutritional drink, or a combination thereof.
61. (withdrawn) The food product of claim 57, wherein the food product is an additive for animal or human food.
62. (withdrawn) The food product of claim 57, wherein the food product is a nutritional supplement.
63. (withdrawn) The food product of claim 57, wherein the food product is an animal feed.
64. (withdrawn) The animal feed of claim 63, wherein the animal feed is an aquaculture feed.
65. (withdrawn) The animal feed of claim 63, wherein the animal feed is a domestic animal feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.

66. (withdrawn) An isolated thraustochytrid microorganism of the thraustochytrid species deposited under ATCC Accession No. PTA-9695 or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
67. (withdrawn) An isolated thraustochytrid microorganism having the characteristics of the thraustochytrid species deposited under ATCC Accession No. PTA-9695, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
68. (withdrawn) An isolated thraustochytrid microorganism, or a strain derived therefrom, comprising a triglyceride fraction, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, and wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight of eicosapentaenoic acid.
69. (withdrawn) An isolated thraustochytrid microorganism of the same species as the thraustochytrid deposited under ATCC Accession No. PTA-9695, or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
70. (withdrawn) The isolated thraustochytrid microorganism of any one of claims 66 to 69, wherein the strain derived therefrom is a mutant strain.
71. (withdrawn) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9695.
72. (withdrawn) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9696.

73. (withdrawn) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9697.
74. (withdrawn) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9698.
75. (withdrawn) A thraustochytrid biomass comprising the thraustochytrid microorganism of any one of claims 66 to 74 or mixtures thereof.
76. (withdrawn) An isolated thraustochytrid biomass, wherein at least about 50% by weight of the dry cell weight of the biomass are fatty acids, and wherein at least about 50% by weight of the fatty acids are omega-3 fatty acids.
77. (withdrawn) The isolated thraustochytrid biomass of claim 76, wherein at least about 50% by weight of the fatty acids is docosahexaenoic acid.
78. (withdrawn) An isolated thraustochytrid biomass, wherein at least about 25% by weight of the dry cell weight of the biomass is docosahexaenoic acid.
79. (withdrawn) The isolated thraustochytrid biomass of any one of claims 75 to 78, wherein about 10% or less by weight of the fatty acids is eicosapentaenoic acid, and wherein the weight ratio of docosahexaenoic acid to eicosapentaenoic acid is at least about 5:1.
80. (withdrawn) The isolated thraustochytrid biomass of any one of claims 75 to 79, wherein about 1.5% or less by weight of the fatty acids is arachidonic acid, and wherein the weight ratio of docosahexaenoic acid to arachidonic acid is at least about 20:1.
81. (withdrawn) The isolated thraustochytrid biomass of any one of claims 75 to 80, further comprising docosahexaenoic acid and docosapentaenoic acid n-6 in a weight ratio of at least about 10:1.
82. (withdrawn) An isolated thraustochytrid culture comprising the thraustochytrid microorganism of any one of claims 66 to 74 or mixtures thereof.

83. (withdrawn) The isolated thraustochytrid culture of claim 82, further comprising at least about 5% dissolved oxygen.
84. (withdrawn) A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the thraustochytrid microorganism or thraustochytrid biomass of any one of claims 66 to 81 or mixtures thereof.
85. (withdrawn) A method for producing a microbial oil comprising omega-3 fatty acids, the method comprising:
 - (a) growing the isolated thraustochytrid microorganism of any one of claims 66 to 74 or mixtures thereof in a culture to produce a biomass, and
 - (b) extracting an oil comprising omega-3 fatty acids from the biomass.
86. (withdrawn) The method of claim 85, wherein the culture comprises at least about 5% dissolved oxygen.
87. (withdrawn) The method of claim 85, wherein the culture pH is maintained at about 6.5 to about 8.5.
88. (withdrawn) The method of claim 85, wherein the culture temperature is maintained at about 17 °C to about 30 °C.
89. (withdrawn) The method of claim 85, wherein the culture comprises a glucose concentration of about 5 g/L to about 50 g/L.
90. (withdrawn) A method for producing a microbial oil comprising omega-3 fatty acids, the method comprising extracting an oil comprising omega-3 fatty acids from the biomass of any one of claims 75 to 81.
91. (withdrawn) The method of claim 90, wherein the microbial oil comprising omega-3 fatty acids is extracted using a hexane extraction process.
92. (withdrawn) The method of claim 90, wherein the microbial oil comprising omega-3 fatty acids is extracted using a solventless extraction process.

93. (withdrawn) The method of any one of claims 85 to 92, or the isolated thraustochytrid culture of claim 82 or claim 83, wherein the dry cell weight of biomass isolated from each liter of culture is at least about 50 g after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.
94. (withdrawn) The method of any one of claims 85 to 92, or the isolated thraustochytrid culture of claim 82 or claim 83, wherein the omega-3 fatty acids productivity is at least about 2 g/L/day after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.
95. (withdrawn) A microbial oil produced by the method of any one of claims 85 to 94.
96. (withdrawn) Use of the isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, for the manufacture of a medicament for the treatment of inflammation or a condition related thereto.
97. (withdrawn) Use of the isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, for the treatment of inflammation or a condition related thereto.
98. (withdrawn) The isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, for use in the treatment of inflammation or a condition related thereto.
99. (withdrawn) A method for treating inflammation or a condition related thereto in a subject in need thereof, comprising administering to the subject the isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, and a pharmaceutically acceptable carrier.

Remarks

Upon entry of the foregoing amendments, claims 51-99 are pending in the application, with claims 51, 53, 54, 66-69, 71-74, 76, and 78 being the independent claims. Claims 61-99 have been withdrawn pursuant to the Office Action of July 13, 2011. Claims 1-50 were previously canceled without prejudice to or disclaimer of the subject matter therein. Applicants reserve the right to pursue any of the canceled subject matter.

Claims 51-56 have been amended to delete the word "about." Claim 59 has been amended to delete the phrase "is suitable for" and to add the phrase "can be consumed by." Support for this amendment can be found, for example, at page 21, paragraph [0063] of the application as filed. These changes are believed to introduce no new matter, and their entry is respectfully requested.

I. Elections Made Without Traverse

The Office Action states that Applicants' Reply to Restriction Requirement filed on July 5, 2011 did not indicate whether Applicants' elections were made with or without traverse. *See* Office Action at pg. 2, lines 5-8. However, the fourth full paragraph on page 1 of Applicants' Reply to Restriction Requirement clearly indicates that the "elections . . . are made **without traverse**."

II. Rejections under 35 U.S.C § 112, Second Paragraph

Claims 51-60 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicants respectfully traverse the rejection.

The Office Action alleges that the word "about" is not defined and should be deleted from the claims. While Applicants respectfully disagree, claims 51-56 have been amended to delete the word "about," solely for the purpose of expediting prosecution of this application. Claims 57-60, which depend directly or indirectly from claims 51-54, do not recite the word "about."

The Office Action further alleges that the word "suitable" in claim 59 is unclear. While Applicants respectfully disagree, claim 59 has been amended to replace the phrase "is suitable for" with the phrase "can be consumed by," solely for the purpose of expediting prosecution of this application.

Based on the foregoing, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 51-60 under 35 U.S.C. § 112, second paragraph.

III. Rejections under 35 U.S.C. § 103

Claims 51-54 and 57-60 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over US 2003/0060509 A1 ("Van Elswyk"). Claims 51-55 and 57-60 were rejected as allegedly being unpatentable over Van Elswyk in view of US 6,399,803 B1 ("Corley *et al.*"). Applicants respectfully traverse the rejections.

Specifically, the Office Action alleges that 51-54 and 57-60 are obvious over Van Elswyk because "some of the quantities recited in the claims are explicitly disclosed in the reference, . . . quantities that are not disclosed may be calculated from the quantities that are disclosed." Office Action at pg. 5, lines 8-11. The Office Action further alleges

that claim 55, which depends from claim 51-54, is obvious over Van Elswyk in view of Corley *et al.* Office Action at pg. 5, lines 15-19. However, as discussed in detail below, the quantities recited in the claims are **not** disclosed in Van Elswyk and Corley *et al.* does not overcome the deficiencies of Van Elswyk.

A. *Van Elswyk does not disclose an oil comprising at least 70% triglycerides by weight.*

Independent claims 51, 53, and 54 recite a microbial oil comprising a triglyceride fraction of at least 70% by weight. In other words, at least 70% by weight of the oil is triglycerides. The Office Action characterized Van Elswyk as disclosing "an infant formula comprising an oil that comprises HUFA's including DHA, DPA and ARA" and that "[t]he oil, as a highly purified algal oil, comprises at least 70% triglycerides by weight." See Office Action at pg. 4, lines 10-13. Applicants respectfully disagree.

Van Elswyk discloses a HUFA in at least 1 of 5 forms: "the HUFA is in the form of at least one of highly purified algal oil comprising 70% or more of the desired HUFA, triglyceride oil combined with phospholipid, phospholipid, protein and phospholipid combination, or dried marine microalgae." See Van Elswyk at pg. 2, para. [0029] (emphasis added), i.e. "at least 1 of" modifies each of the underlined forms. Van Elswyk does **not** disclose any of the 5 forms of HUFA as being an oil comprising 70% triglycerides by weight. Instead, one form is an oil comprising 70% or more of **the desired HUFA**, which does not require the desired HUFAs to be present in the triglyceride fraction. Another form is a triglyceride oil combined with phospholipid, which does not require the combination to have at least 70% triglycerides. As such, Van Elswyk's disclosure regarding a highly purified algal oil comprising 70% or more of the

desired HUFA **cannot** be construed as being equivalent to an algal oil comprising at least 70% triglycerides by weight.

Therefore, Van Elswyk does not disclose a microbial oil comprising a triglyceride fraction of at least 70% by weight, as alleged in the Office Action.

B. Van Elswyk does not disclose a DHA content of the triglyceride fraction of at least 50% by weight, or a DPA(n-6) content of the triglyceride fraction of at least 0.5% by weight to 6% by weight.

Claims 51, 53, and 54 recite that the DHA content of the triglyceride fraction is at least 50%, 40%, and 60% by weight, respectively. In other words, the claimed percentages of DHA are not percentages of DHA in the total oil, but are instead percentages in the triglyceride fraction. Claims 51 and 53 recite a DPA(n-6) (omega-6 docosapentaenoic acid) content of the triglyceride fraction of at least 0.5% by weight to 6% by weight. The Office Action characterized Van Elswyk as disclosing a triglyceride fraction of the oil that comprises at least 50% DHA and 0.5-6% DPA. *See* Office Action at pg. 4, lines 17-18. Applicants respectfully disagree.

As discussed previously, Van Elswyk discloses a HUFA in at least 1 of 5 forms, including (1) a highly purified algal oil comprising 70% or more of the desired HUFA and (2) a triglyceride oil combined with phospholipid. Van Elswyk discloses that: "[p]referably the **total fatty acids** in a highly purified DHA algal oil comprise from about 70% to about 99% weight DHA." *See* Van Elswyk at pg. 3, para. [0038] (emphasis added). In addition, Van Elswyk discloses a ***maternal supplement*** comprising about 20% to about 80% **total fatty acid** as DHA and/or from about 1% to about 20% **total fatty acid** as DPA(n-6). *See* Van Elswyk at pg. 5, para. [0064] (emphasis added).

With respect to the amount of DHA or DPA(n-6) present either in the highly purified algal oil or in the maternal supplement disclosed in Van Elswyk, the amounts are expressed as a percentage of the **total fatty acids**. Total fatty acids in a highly purified algal oil as discussed in Van Elswyk would include not only fatty acids in the triglyceride fraction, but also fatty acids in all other fractions of the oil, such as the phospholipid fraction. Therefore, the disclosure of the DHA and DPA(n-6) content in Van Elswyk is not specific for the triglyceride fraction and includes DHA and DPA(n-6) from non-triglyceride fractions of an oil such as the phospholipid fraction. Therefore, Van Elswyk does not disclose a DHA content of the **triglyceride fraction** of at least 50% by weight or a DPA(n-6) content of the **triglyceride fraction** of at least 0.5% by weight to 6% by weight.

In addition, the disclosure regarding the content of DHA and DPA(n-6) in combination is with respect to total fatty acids in a ***maternal supplement***, and not an algal oil. Since ingredients other than the algal oil can be present in a maternal supplement, the percentages of DHA and DPA(n-6) of an algal oil that is used to produce the maternal supplement may be different from the percentages of DHA and DPA(n-6) of the resulting supplement. Therefore, Van Elswyk's disclosure of the DHA and DPA(n-6) content in the ***maternal supplement*** cannot be construed as the equivalent of disclosing the DHA and DPA(n-6) content in the **triglyceride fraction** of a ***microbial oil*** as claimed by Applicants.

Based on the foregoing, Van Elswyk does not disclose a DHA content of the triglyceride fraction of at least 50% by weight, or a DPA(n-6) content of the triglyceride fraction of at least 0.5% by weight to 6% by weight.

C. Corley et al. does not cure the deficiencies of Van Elswyk.

At page 5 of the Office Action, it is alleged that claims 51-55 and 57-60 are rejected over Van Elswyk in view of Corley *et al.* However, the rejection only discusses the disclosure of Corley *et al.* with regards to claim 55. As such, it is Applicants understanding that only claim 55 is at issue with regards to the combination of Van Elswyk with Corley *et al.* Any teachings of Corley *et al.* with regard to positional locations of DHA on the triglyceride molecule cannot overcome the deficiencies of Van Elswyk as noted above with regards to the specific quantities recited in claims 51-54, which are necessarily included in claim 55 based on claim dependency.

To the extent that any rejection of claims 51-54 and 57-60 was also intended over the combination of Van Elswyk and Corley *et al.*, Applicants note that Corley *et al.* also fails to teach the quantities recited in the claims. At best, Corley *et al.* discloses a DHA-rich oil that contains triglycerides with approximately 40.9% DHA and 16.2% DPA(n-6). See Corley *et al.* at Example 1, col. 13, lines 4-7. Corley *et al.* does not disclose a DHA content of the triglyceride fraction of at least 50%, as required by claims 51 and 54. The ratio of DHA to DPA(n-6) in Corley *et al.*, calculated from the numbers provided above, is approximately 2.5:1. Therefore, Corley does not disclose a ratio of DHA to DPA(n-6) that is greater than 6:1, as required by claim 53.

D. Conclusion

Independent claims 51, 53, and 54 recite a microbial oil comprising a triglyceride fraction of at least 70% by weight. Claims 51 and 54 further recite a DHA content of the

triglyceride fraction of at least 50% by weight or at least 60% by weight, respectively, while claim 53 further recites a DPA(n-6) content of the triglyceride fraction of at least 0.5% by weight to 6% by weight, and a ratio of DHA to DPA(n-6) that is greater than 6:1. The Office Action alleges that these features are quantities that are either explicitly disclosed in the cited reference or may be calculated from the quantities disclosed, thereby rendering the claimed invention obvious. *See* Office Action at pg. 5, lines 8-11. However, based on Applicants' above discussion of Van Elswyk and Corley *et al.*, it is clear that the claimed features are not explicitly disclosed and cannot be calculated from the quantities disclosed in the cited references, when the references are considered alone or in combination.

Therefore, for at least the reasons outlined above, Applicants respectfully request that the rejections of claims 51-55 and 57-60 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

IV. Provisional Obviousness-Type Double Patenting Rejections

Claims 51-60 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 24-35 of co-pending Appl. No. 12/729,013 and claims 39-57 of co-pending Appl. No. 13/151,014.

Applicants respectfully request that these statutory double patenting rejections be held in abeyance until allowable subject matter in the present application or the cited co-pending applications is indicated.

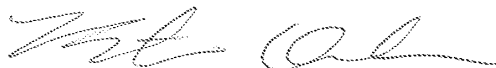
The Office Action requested that Applicants provide information regarding any additional, related patents and/or co-pending applications. In addition to the co-pending applications identified in the Office Action, Applicants draw the Office's attention to co-pending Appl. No. 13/220,259, which is a divisional of the present application. Claims 20-30 of the divisional application are similar to claims 51-60 being examined in the present application. However, Applicants intend to file an amendment in the divisional application to preempt a double-patenting objection.

Conclusion

Prompt and favorable consideration of this Amendment and Reply 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.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Katrina Quach
Attorney for Applicants
Registration No. 51,063

Date: October 13, 2011

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1429815.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Apt *et al.*

Appl. No.: 12/407,687

Filed: March 19, 2009

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of
Making and Uses Thereof**

Confirmation No.: 7806

Art Unit: 1652

Examiner: KOSSON, Rosanne

Atty. Docket: 2715.0030000/JUK/SAS/KPQ

Information Disclosure Statement

Mail Stop Amendment

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

Sir:

Listed on accompanying IDS Forms PTO/SB/08a equivalent and PTO/SB/08b equivalent are documents that may be considered material to the patentability of this application as defined in 37 C.F.R. §1.56, and in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.97 and 1.98.

Where the publication date of a listed document does not provide a month of publication, the year of publication of the listed document is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the month of publication is not in issue. Applicant has listed publication dates on the attached IDS Forms based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicant reserves the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may

not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application. The required fee is provided through online credit card payment authorization in the amount of \$180.00 in payment of the fee under 37 C.F.R. § 1.17(p).

A concise explanation of the relevance of the non-English language document(s) appears below in accordance with 37 C.F.R. § 1.98(a)(3).

Document **NPL29** is in the German language. It is believed that document **NPL30** is an English language translation of document **NPL29**.

Copies of documents **FP1-FP16** and **NPL1-NPL40** are submitted. However, in accordance with 37 C.F.R. § 1.98(a)(2), no copies of U.S. patents and patent application publications cited as documents **US1-US90** on the attached IDS Forms are submitted.

Applicants direct the Examiner's attention to the following co-pending U.S. applications, which may be directed to related technical subject matter:

Atty. Dkt. No. 2715.0030000/JUK/SAS/KPQ

U.S. Application No. 13/220,259, inventors Apt *et al.*, filed August 29, 2011, listed as Document **NPL39**;

U.S. Application No. 12/729,013, inventors Apt *et al.*, filed March 22, 2010, and published on July 21, 2011 as U.S. Publication No. 2011/0177031, listed as Document **US90**;

U.S. Application No. 12/727,851, inventors Apt *et al.*, filed March 19, 2010, and published on October 21, 2010 as U.S. Publication No. 2010/0266564, listed as Document **US87**; and

U.S. Application No. 13/151,014, inventors Cherinko *et al.*, filed June 1, 2011, listed as Document **NPL40**.

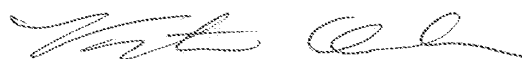
The identification of these co-pending applications is not to be construed as a waiver of secrecy as to these applications now or upon issuance of the present application as a patent. The Examiner is respectfully requested to consider the cited applications and the art cited therein during examination.

It is respectfully requested that the Examiner initial and return a copy of the enclosed IDS Forms, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



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Attorney for Applicants
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Date: October 13, 2011

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Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	12/407,687
				Filing Date	March 19, 2009
				First Named Inventor	Kirk E. APT
				Art Unit	1652
Examiner Name	KOSSON, Rosanne				
Sheet	1	of	4	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	US1	4,485,173	11-27-1984	Gierhart	
	US2	4,916,066	04-10-1990	Akimoto <i>et al.</i>	
	US3	5,130,242	07-14-1992	Barclay	
	US4	5,244,921	09-14-1993	Kyle <i>et al.</i>	
	US5	5,246,841	09-21-1993	Yazawa <i>et al.</i>	
	US6	5,314,812	05-24-1994	Akimoto <i>et al.</i>	
	US7	5,340,594	08-23-1994	Barclay	
	US8	5,340,742	08-23-1994	Barclay	
	US9	5,401,646	03-28-1995	Shinmen <i>et al.</i>	
	US10	5,547,699	08-20-1996	Iizuka <i>et al.</i>	
	US11	5,698,244	12-16-1997	Barclay	
	US12	6,180,376 B1	01-30-2001	Liddell	
	US13	6,248,909 B1	06-19-2001	Akimoto <i>et al.</i>	
	US14	6,255,505 B1	07-03-2001	Bijl <i>et al.</i>	
	US15	6,372,460 B1	04-16-2002	Gladue <i>et al.</i>	
	US16	6,410,282 B1	06-25-2002	Kumar <i>et al.</i>	
	US17	6,441,208 B2	08-27-2002	Bijl <i>et al.</i>	
	US18	6,451,567 B1	09-17-2002	Barclay	
	US19	6,461,839 B2	10-08-2002	Yokochi <i>et al.</i>	
	US20	6,509,178 B1	01-21-2003	Tanaka <i>et al.</i>	

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)			
	FP1	EP 0 252 716 B1	01-13-1988	Suntory Limited	
	FP2	EP 0 273 708 B1	07-06-1988	Sagami Chemical Research Center	
	FP3	EP 0 521 104 B1	01-07-1993	Martek Corporation	
	FP4	EP 0 512 997 B1	11-19-1992	OmegaTech Inc.	
	FP5	EP 0 669 809 B1	09-06-1995	Omegatech, Inc.	
	FP6	EP 0 823 475 A1	02-11-1998	Japan as represented by Director-General, Agency of Industrial Science and Technology; Nagase Biochemicals, Ltd.; Suntory Limited	
	FP7	EP 0 894 142 B1	02-03-1999	DSM IP Assets B.V.	

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, 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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Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Application Number	12/407,687
				Filing Date	March 19, 2009
				First Named Inventor	Kirk E. APT
				Art Unit	1652
				Examiner Name	KOSSON, Rosanne
Sheet	2	of	4	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

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		Number-Kind Code ² (if known)			
	US21	6,566,123 B1	05-20-2003	Barclay	
	US22	6,579,714 B1	06-17-2003	Hirabayashi <i>et al.</i>	
	US23	6,582,941 B1	06-24-2003	Yokochi <i>et al.</i>	
	US24	6,596,766 B1	07-22-2003	Igarashi <i>et al.</i>	
	US25	6,607,900 B2	08-19-2003	Bailey <i>et al.</i>	
	US26	6,677,470 B2	01-13-2004	Saebo <i>et al.</i>	
	US27	6,727,373 B2	04-27-2004	Bijl <i>et al.</i>	
	US28	6,746,857 B1	06-08-2004	Higashiyama <i>et al.</i>	
	US29	6,783,951 B2	08-31-2004	Long, H	
	US30	6,812,009 B2	11-02-2004	Gladue <i>et al.</i>	
	US31	6,844,021 B2	01-18-2005	Koike <i>et al.</i>	
	US32	6,846,942 B2	01-25-2005	Rubin	
	US33	7,005,280 B2	02-28-2006	Barclay	
	US34	7,011,962 B2	03-14-2006	Barclay	
	US35	7,022,512 B2	04-04-2006	Barclay	
	US36	7,259,006 B2	08-21-2007	Komazawa <i>et al.</i>	
	US37	7,514,244 B2	04-07-2009	Tanaka <i>et al.</i>	
	US38	7,709,236 B2	05-04-2010	Akimoto <i>et al.</i>	
	US39	7,723,386 B2	05-25-2010	Akimoto <i>et al.</i>	
	US40	7,767,427 B2	08-03-2010	Akimoto <i>et al.</i>	
	US41	7,863,026 B2	01-04-2011	Komazawa <i>et al.</i>	
	US42	2001/0041358 A1	11-15-2001	Yokochi <i>et al.</i>	
	US43	2002/0001833 A1	01-03-2002	Ruecker <i>et al.</i>	

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		Country Code ³ Number ⁴ Kind Code ⁵ (if known)			
	FP8	EP 1 276 891 B1	01-22-2003	Council of Scientific and Industrial Research	
	FP9	EP 1 818 410 A1	08-15-2007	Suntory Limited	
	FP10	WO 02/092540 A1	11-21-2002	Martek Biosciences Boulder Corporation	
	FP11	WO 2007/006078 A1	01-18-2007	Adelaide Research and Innovation PTY Ltd	
	FP12	WO 2007/068997 A2	06-21-2007	Avestha Gengraine Technologies PVT.LTD.	

Examiner Signature	Date Considered
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U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	
		Number-Kind Code ² (if known)				
	US44	2002/0026063 A1	02-28-2002	Luthria		
	US45	2002/0123111 A1	09-05-2002	Gladue <i>et al.</i>		
	US46	2003/0143659 A1	07-31-2003	Bijl <i>et al.</i>		
	US47	2003/0161864 A1	08-28-2003	Tanaka <i>et al.</i>		
	US48	2003/0180898 A1	09-25-2003	Bailey <i>et al.</i>		
	US49	2004/0067574 A1	04-08-2004	Bijl <i>et al.</i>		
	US50	2004/0161831 A1	08-19-2004	Komazawa <i>et al.</i>		
	US51	2004/0203120 A1	10-14-2004	Kumar <i>et al.</i>		
	US52	2004/0236128 A1	11-25-2004	Rubin		
	US53	2005/0019880 A1	01-27-2005	Raghukumar <i>et al.</i>		
	US54	2005/0129831 A1	01-16-2005	Fabritius		
	US55	2005/0170479 A1	08-04-2005	Weaver <i>et al.</i>		
	US56	2005/0202148 A1	09-15-2005	Streekstra <i>et al.</i>		
	US57	2005/0287651 A1	12-29-2005	Akimoto <i>et al.</i>		
	US58	2006/0110806 A1	05-25-2006	Damude <i>et al.</i>		
	US59	2006/0115881 A1	06-01-2006	Damude <i>et al.</i>		
	US60	2006/0141592 A1	06-29-2006	Sumida <i>et al.</i>		
	US61	2006/0286648 A1	12-21-2006	Bailey <i>et al.</i>		
	US62	2007/0003686 A1	01-04-2007	Fichtali <i>et al.</i>		
	US63	2007/0015263 A1	01-18-2007	Wumpelmann		
	US64	2007/0148315 A1	06-28-2007	Schaap <i>et al.</i>		
	US65	2007/0269507 A1	11-22-2007	Sachetto <i>et al.</i>		
	US66	2007/0299134 A1	12-27-2007	Miller <i>et al.</i>		
	US67	2008/0009045 A1	01-10-2008	Komazawa <i>et al.</i>		
	US68	2008/0020033 A1	01-24-2008	Kawashima <i>et al.</i>		
	US69	2008/0026103 A1	01-31-2008	Fichtali <i>et al.</i>		
	US70	2008/0032353 A1	02-07-2008	Behrens <i>et al.</i>		
	US71	2008/0038789 A1	02-14-2008	Higashiyama		
FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ Number ² Kind Code ⁴ (if known)				
	FP13	WO 2007/069078 A2	06-21-2007	Ocean Nutrition Canada Ltd.		
	FP14	WO 2008/067605 A1	06-12-2008	Biomass Research & Refining Pty Ltd.		

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		Filing Date	March 19, 2009
		First Named Inventor	Kirk E. APT
		Art Unit	1652
		Examiner Name	KOSSON, Rosanne
Sheet 4 of 4	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ	

U.S. PATENT DOCUMENTS					
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		Number-Kind Code ² (If Known)			
	US72	2008/0076164 A1	03-27-2008	Ciprus <i>et al.</i>	
	US73	2008/0107791 A1	05-08-2008	Fichtali <i>et al.</i>	
	US74	2008/0166781 A1	07-10-2008	Higashiyama <i>et al.</i>	
	US75	2008/0199923 A1	08-21-2008	Barclay	
	US76	2008/0234377 A1	09-25-2008	Ellis	
	US77	2008/0292681 A1	11-27-2008	Domingo Pedrol <i>et al.</i>	
	US78	2009/0004219 A1	01-01-2009	Kallenmareth <i>et al.</i>	
	US79	2009/0011012 A1	01-08-2009	Baum	
	US80	2009/0093543 A1	04-09-2009	Xue <i>et al.</i>	
	US81	2009/0099261 A1	04-16-2009	Bell <i>et al.</i>	
	US82	2009/0192304 A1	07-30-2009	Roessler <i>et al.</i>	
	US83	2009/0304784 A1	12-10-2009	Mane <i>et al.</i>	
	US84	2010/0130610 A1	05-27-2010	Keller <i>et al.</i>	
	US85	2010/0167359 A1	07-01-2010	Katano <i>et al.</i>	
	US86	2010/0178369 A1	07-15-2010	Arledge <i>et al.</i>	
	US87	2010/0266564 A1	10-21-2010	Apt <i>et al.</i>	
	US88	2010/0285105 A1	11-11-2010	Radianingtyas	
	US89	2010/0099765 A1	04-22-2010	Chilton <i>et al.</i>	
	US90	2011/0177031 A1	07-21-2011	Apt <i>et al.</i>	
	US91				
	US92				
	US93				
	US94				
	US95				
	US96				

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		Country Code ² Number ³ Kind Code ⁴ (If known)			
	FP15	WO 2010/097809 A2	09-02-2010	V.B. Medicare Pvt. Ltd.	
	FP16	WO 2010/119319 A1	10-21-2010	Pronova Biopharma Norge AS	

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Substitute for form 1449/PTO		Complete if Known			
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	12/407,687		
		Filing Date	March 19, 2009		
		First Named Inventor	Kirk E. APT		
		Art Unit	1652		
		Examiner Name	KOSSON, Rosanne		
Sheet	1	of	5	Attorney Docket Number	2715.0030000/JUK/SAS/KPQ

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	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, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
	NPL1	ASHFORD, A., <i>et al.</i> , "Electron Microscopy May Reveal Structure of Docosahexaenoic Acid-Rich Oil Within Schizochytrium sp." <i>Lipids</i> 12:1377-1386, AOCS Press, Germany (2000)	
	NPL2	BAJPAI, P., <i>et al.</i> , "Production of docosahexaenoic acid by <i>Thraustochytrium aureum</i> ," <i>Appl. Microbiol. Biotechnol.</i> 35:706-710, Springer-Verlag, Germany (1991)	
	NPL3	BAJPAI, P., <i>et al.</i> , "Optimization of Production of Docosahexaenoic Acid (DHA) by <i>Thraustochytrium aureum</i> ATCC 34304," <i>J. Am. Oil Chem. Soc.</i> 68(7):509-514, American Oil Chemists Society, United States (1991)	
	NPL4	BERGÉ, Jean-Pascal and BARNATHAN, Gilles, "Fatty-Acids from Lipids of Marine Organisms: Molecular Biodiversity, Roles as Biomarkers, Biologically Active Compounds, and Economical Aspects" <i>Adv Biochem Engin/Biotechnol</i> 96:49-125, Springer-Verlag, Germany (2005)	
	NPL5	BURJA, A.M., <i>et al.</i> , "Isolation and characterization of polyunsaturated fatty acid producing <i>Thraustochytrium</i> species: screening of strains and optimization of omega-3 production," <i>Appl. Microbiol Biotechnol.</i> 72(6):1161-1169, Springer-Verlag, Germany (2006)	
	NPL6	COHEN, Z., <i>et al.</i> , "Overproduction of γ -Linolenic and Eicosapentaenoic Acids by Algae," <i>Plant Physiol.</i> 98:569-572, American Society of Plant Biologists, United States (1992)	
	NPL7	FAN, <i>et al.</i> "Eicosapentaenoic and docosahexaenoic acids production by and okara-utilizing potential of thraustochytrids." <i>J Ind. Microbiol. Biotechnol.</i> 4:199-202, Springer, England (2001)	
	NPL8	GenBank AB022109.1 [online] <i>Thraustochytrium aggregatum</i> gene for 18S rRNA. 16 June 2001, accessed at http://www.ncbi.nlm.nih.gov/nuccore/5509888	
	NPL9	GOLDSTEIN, S. and BELSKY, M., "Axenic culture studies of a new marine phycomycete processing an unusual type of asexual reproduction," <i>Amer. Jour. Bot.</i> 51(1):72-78, Botanical Society Of America, United States (1964)	
	NPL10	HONDA, D., <i>et al.</i> , " <i>Schizochytrium limacinum</i> sp. nov., a new thraustochytrid from a mangrove area in the west Pacific Ocean," <i>Mycol. Res.</i> 102(4):439-448, Cambridge University Press for the British Mycological Society, England (1998)	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	12/407,687
		Filing Date	March 19, 2009
		First Named Inventor	Kirk E. APT
		Art Unit	1652
		Examiner Name	KOSSON, Rosanne
		Attorney Docket Number	2715.0030000/JUK/SAS/KPO
Sheet	2	of	5

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	NPL11	HORROCKS, L.A. and YOUNG, K.Y., "Health benefits of docosahexaenoic acid (DHA)," <i>Pharmacol. Res.</i> 40(3):211-225, Academic Press, England (1999)	
	NPL12	HUANG, J., <i>et al.</i> , "Profile of Polyunsaturated Fatty Acids Produced by <i>Thraustochytrium</i> sp. KK17-3", <i>J. Am. Oil Chem. Soc.</i> 78(6): 605-610, AOCS Press, Germany (2001)	
	NPL13	HUANG, J., <i>et al.</i> , "Grouping Newly Isolated Docosahexaenoic Acid-Producing <i>Thraustochytrids</i> Based on Their Polyunsaturated Fatty Acid Profiles and Comparative Analysis of 18S rRNA Genes", <i>Mar. Biotechnol.</i> 5:450-457, Springer-Verlag, New York, Inc., United States (2003)	
	NPL14	IIDA, I. <i>et al.</i> , "Improvement of Docosahexaenoic Acid Production in a Culture of <i>Thraustochytrium aureum</i> by Medium Optimization" <i>J. Ferment. Bioeng.</i> 81(1):76-78, National Institute of Bio-science and Human Technology, Japan (1996)	
	NPL15	International Search Report with Written Opinion for International Application No. PCT/US2009/001720, European Patent Office, Netherlands, mailed on May 22, 2009	
	NPL16	KENDRICK, A. and RATLEDGE, C., "Lipids of Selected Molds Grown for Production of n-3 and n-6 Polyunsaturated Fatty Acids" <i>Lipids</i> 27(1):15-20, Springer, Germany (1992)	
	NPL17	LEWIS, T. <i>et al.</i> , "The Biotechnological Potential of <i>Thraustochytrids</i> " <i>Mar. Biotechnol.</i> 1:580-587, Springer-Verlag, New York, Inc., United States (1999)	
	NPL18	LEWIS, T., "Characterisation and application of Australian <i>thraustochytrids</i> ", Thesis submitted in fulfillment of the requirements of the degree of Doctor of Philosophy to The University of Tasmania, dated March 7, 2001, pp. i-169	
	NPL19	MO, C., <i>et al.</i> , "Development of a PCR strategy for <i>thraustochytrid</i> identification based on 18S rDNA sequence" <i>Marine Biology</i> 140:883-889, Springer, Germany (2002)	
	NPL20	PORTER, D., "Phylum Labyrinthulomycota," in <i>Handbook of Protoctista</i> , Margulis, L., Corliss, J.O., Melkonian, M., Chapman, D.J. (eds), Jones and Barlett, Boston, United States, pp. 388-398 (1989)	

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	NPL21	RAGAN, M.A., "Protistan parasite QPX of hard-shell clam <i>Mercenaria mercenaria</i> is a member of Labyrinthulomycota," <i>Dis. Aquat. Org.</i> 42:185-190, Inter-Research, Germany (2000)	
	NPL22	RAGHUKUMAR, S., "Thraustochytrid Marine Protists: Production of PUFAs and Other Emerging Technologies", <i>Mar. Biotechnol.</i> 10:631-640, Springer, Germany (August 2008)	
	NPL23	ROCHE, Helen M., "Unsaturated fatty acids" <i>Proceedings of the Nutrition Society</i> 58:397-401, Unit of Nutrition and Dietetics, Trinity Centre for Health Sciences, Republic of Ireland (1999)	
	NPL24	RYAN, A.S., <i>et al.</i> , "Clinical Overview of Algal-Docosahexaenoic Acid: Effects on Triglyceride Levels and Other Cardiovascular Risk Factors," <i>Am. J. Therap.</i> 16:183-192, Lippincott Williams & Wilkins, United States (March 2009)	
	NPL25	SIMOPOULOS, Artemis, "Omega-3 Fatty Acids in Inflammation and Autoimmune Diseases" <i>J. Am. Col.Nutr.</i> 21(6):495-505, American College of Nutrition, Washington, D.C., United States (2002)	
	NPL26	SINGH, A. <i>et al.</i> , "Docosahexaenoic acid (DHA) production by <i>Thraustochytrium</i> sp. ATCC 20892," <i>World J Microbiol. Biotechnol</i> 12:76-81, Rapid Science Publishers, United States (1996)	
	NPL27	SINGH, A. <i>et al.</i> , "Production of high yields of docosahexaenoic acid <i>Thraustochytrium roseum</i> ATCC 28210," <i>J Indust. Microbiol.</i> 16:370-373, Society for Industrial Microbiology, United States (1996)	
	NPL28	SINGH, Meharban, "Essential Fatty Acids, DHA and Human Brain" <i>Indian J. Pediatr.</i> 72:239-242 (2005)	
	NPL29	ULKEN, A., "Zwei neue Thraustochytrien aus der Außenweser" <i>Veröffentlichungen des Institut für Meeresforschung in Bremerhaven, IX:</i> 289-295 (1965)	
	NPL30	English language translation of ULKEN, A., "Zwei neue Thraustochytrien aus der Außenweser" <i>Veröffentlichungen des Institut für Meeresforschung in Bremerhaven, IX:</i> 289-295 (1965)	

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	NPL31	VAZHAPPILLY, R. and CHEN, F., "Eicosapentaenoic Acid and Docosahexaenoic Acid Production Potential of Microalgae and Their Heterotrophic Growth," <i>J. Am. Oil Chem. Soc.</i> 75(3):393-397, AOCs Press, United States (1998)
	NPL32	YOKOYAMA, R., <i>et al.</i> , "Taxonomic rearrangement of the genus <i>Ulkenia</i> sensu lato based on morphology, chemotaxonomical characteristics, and 18S rRNA gene phylogeny (Thraustochytriaceae, Labryrinthulomycetes): emendation for <i>Ulkenia</i> and erection of <i>Botryochytrium</i> , <i>Parietichytrium</i> , and <i>Sicyoidochytrium</i> gen. nov." <i>Mycoscience</i> 48:329-341, The Mycological Society of Japan and Springer, Japan (2007)
	NPL33	YONGMANITCHAI, W., and WARD, O., "Omega-3 Fatty Acids: Alternative Sources of Production" <i>Process Biochemistry</i> 24:117-125, Elsevier, United States (1989)
	NPL34	ZELLER, S. <i>et al.</i> , "Production of Docosahexaenoic Acid from Microalgae" <i>ACS Symposium Series</i> 788, 9:108-124, American Chemical Society (2001)
	NPL35	"Biofuel Development Shifting From Soil To Sea, Specifically To Marine Algae," <i>ScienceDaily</i> accessed at http://www.sciencedaily.com/releases/2008/12/081220084424.htm , published January 4, 2009
	NPL36	ATCC Certificate of Deposits for Strains 27173, 27173-C, 27173-E, and 27173-G, received January 07, 2009
	NPL37	BAHNWEG, G., "Final Report on the Identification of Thraustochytrid Strains MK27173 and MK27977" and Expert Qualifications of Dr. Gunther Bahnweg (October 2008)
	NPL38	LEANDER, C., "Evaluation of two thraustochytrid isolates, MK27173 and MK27977" and Expert Qualifications of Dr. Celeste Leander (July 2008)
	NPL39	Co-pending U.S. Application No. 13/220,259, inventors Apt <i>et al.</i> , filed August 29, 2011.

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				<i>Filing Date</i>	March 19, 2009
				<i>First Named Inventor</i>	Kirk E. APT
				<i>Art Unit</i>	1652
				<i>Examiner Name</i>	KOSSON, Rosanne
Sheet	5	of	5	<i>Attorney Docket Number</i>	2715.0030000/JUK/SAS/KPQ
	NPL40	Co-pending U.S. Application No. 13/151,014, inventors Cherinko <i>et al.</i> , filed June 1, 2011.			

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Electronic Patent Application Fee Transmittal				
Application Number:		12407687		
Filing Date:		19-Mar-2009		
Title of Invention:		Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof		
First Named Inventor/Applicant Name:		Kirk E. APT		
Filer:		Katrina Y.Pei Quach/Kim Perry		
Attorney Docket Number:		2715.0030000/JUK/SAS		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
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:	11185197
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Katrina Y.Pei Quach/Kim Perry
Filer Authorized By:	Katrina Y.Pei Quach
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	13-OCT-2011
Filing Date:	19-MAR-2009
Time Stamp:	21:38:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$180
RAM confirmation Number	5887
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1		27150030000.pdf	1974999	yes	18
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	Multipart Description/PDF files in .zip description				
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	Miscellaneous Incoming Letter	1	2		
	Amendment/Req. Reconsideration-After Non-Final Reject	3	3		
	Claims	4	9		
	Applicant Arguments/Remarks Made in an Amendment	10	18		
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2		27150030000_IDS.pdf	2208905	yes	13
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	Transmittal Letter	1	4		
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Warnings:					
Information:					
Total Files Size (in bytes):			4214268		

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.

KATRINA QUACH
ASSOCIATE*
(202) 772-8963
KQUACH@SKGF.COM



October 13, 2011

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

Confirmation No. 7806
Art Unit 1652
Mail Stop Amendment

Re: U.S. Utility Patent Application
Application No. 12/407,687; Filing Date: March 19, 2009
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making
and Uses Thereof**
Inventors: Kirk E. Apt *et al.*
Our Ref: 2715.0030000/JUK/SAS/KPQ

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Online Credit Card Payment Authorization in the amount of **\$180.00** to cover the fee for submission of an Information Disclosure Statement;
2. Information Disclosure Statement Under 37 C.F.R. § 1.97(c);
3. Form PTO/SB/08a (4 sheets) listing **106** documents (**US1-US90 and FP1-FP16**);
4. Form PTO/SB/08b (5 sheets) listing **40** documents (**NPL1-NPL40**);
5. Copies of documents **FP1-FP16** and **NPL1-NPL40**; and
6. Amendment and Reply Under 37 C.F.R. 1.111.

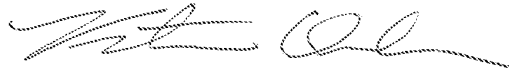
In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

Commissioner for Patents
October 13, 2011
Page 2

Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Katrina Quach
Attorney for Applicants
Registration No. 51,063

JUK/SAS/KPQ/rjv
Enclosure(s)

1431352_1.DOCX

Electronic Acknowledgement Receipt	
EFS ID:	11185185
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Katrina Y.Pei Quach/Kim Perry
Filer Authorized By:	Katrina Y.Pei Quach
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	13-OCT-2011
Filing Date:	19-MAR-2009
Time Stamp:	21:42:28
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	Foreign Reference	FP1_EP252716B1.pdf	873439 5416aa65fb80bf976cfa800c5a3569272e143163	no	11
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Information:					
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<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					

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 12/407,687		Filing Date 03/19/2009		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)		SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			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 \$250 (\$125 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			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT	10/13/2011	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 49	Minus	** 62	= 0	X \$ =		OR	X \$60=	0
	Independent (37 CFR 1.16(h))	* 10	Minus	*** 13	= 0	X \$ =		OR	X \$250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>										

Legal Instrument Examiner:
/VERONICA DAY EVERETT/

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.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806

26111 7590 07/13/2011
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
KOSSON, ROSANNE	

ART UNIT	PAPER NUMBER
1652	

MAIL DATE	DELIVERY MODE
07/13/2011	PAPER

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.

Office Action Summary	Application No. 12/407,687	Applicant(s) APT ET AL.
	Examiner ROSANNE KOSSON	Art Unit 1652
	-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 05 July 2011.

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

3) ☐ 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

4) ☒ Claim(s) 51-99 is/are pending in the application.

4a) Of the above claim(s) 61-99 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 51-60 is/are rejected.

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

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

Application Papers

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

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

 a) ☐ All b) ☐ Some * c) ☐ None of:

 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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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DETAILED ACTION

Election/Restrictions

Applicants' election without traverse of Group 1, claims 51-65, in the reply filed on July 5, 2011 is acknowledged. Applicants' elections of the species of a food product (claim 57), infant formula (as the species of food product, claim 58) and sn-1 and sn-2 (as the two positions in the glycerol backbone of the triglyceride that are esterified with DHA, claim 55) are also acknowledged. Because Applicants did not distinctly and specifically point out the supposed errors in the restriction requirement, and because Applicants did not indicate whether their elections were with or without traverse, the election has been treated as an election without traverse (MPEP § 818.03(a)). No claims have been amended. Claims 1-50 have been canceled. Claims 66-99 have been added. Claims 61-99 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to non-elected inventions, there being no allowable generic or linking claim.

Accordingly, claims 51-60 are examined on the merits herewith to the extent that they read on the elected invention.

Regarding re-introduced new claims 66-99, which are duplicates of some of canceled claims 1-50, as discussed in the interview of June 9, 2011, these claims are withdrawn because they are drawn to the inventions that were not elected in Applicants' Response of April 21, 2011 to the restriction requirement Office action of March 21, 2011.

Claim Rejections - 35 USC § 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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.

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Claims 51-60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 51 recites the limitations of at least about 70% by weight of triglycerides in the oil, at least about 50% by weight of DHA in the triglyceride fraction, and about 5% or less by weight (i.e., at most about 5%) of heptadecanoic acid. Similar limitations appear in claims 52-56, e.g., about 1.5% or less by weight of ARA in the triglyceride fraction (claim 52) and a DHA:DPA ratio of greater than about 6:1 (claim 53). The terms less than about, greater than about, at least about and at most about a particular quantity (or their semantic equivalents) are indefinite, rendering the metes and bounds of the claims unclear. These terms are indefinite, because they are the upper and lower limits of ranges that are doubly indefinite. One end of the range is infinity or zero, and the other end of the range is an undefined amount above or below a quantity that itself is not a fixed quantity but a range "about" a particular quantity. The word "about" and the quantities of "about" any particular number are not defined in the specification. Appropriate correction is required. The word "about" should be deleted from the claims.

Claim 59 is indefinite, because it is not clear how the infant formula is "suitable" for a premature infant. What makes a formula suitable or unsuitable? Clarification and appropriate correction are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 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 of this title, 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 negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 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 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 51-54 and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Elswyk (US 2003/0060509 A1).

Van Elswyk discloses an infant formula comprising an oil that comprises HUFA's, including DHA, DPA and ARA. An infant formula is a food product and a beverage. 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. A ratio of 50% DHA to 3% DPA, as an example, is a ratio that is greater than 6:1. As discussed above, numbers in the claims that are preceded by the word "about" are not fixed quantities. Quantities of heptadecanoic acid that are less than a particular value may be zero. The reference does not disclose that the oil contains heptadecanoic acid. Regarding ARA in the oil, Van Elswyk discloses that it is not necessary to add this fatty acid, because the combination of DHA and DPA maintains higher levels of tissue ARA and promotes its accumulation. See paragraphs 52 and 64. Thus, the amount of ARA may be zero, which is

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within the indefinite range of less than or about 1.5% by weight. See claims 51-54, 57, 58 and 60.

Regarding claim 59, as discussed above, it is not clear what makes the claimed infant formula suitable for a premature infant. But, Van Elswyk discloses that cognitive and visual responses are improved in premature infants who are fed a formula containing HUFA's (see paragraph 43). Thus, the infant formula composition in the reference is suitable for a premature infant.

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.

Claims 51-55 and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Elswyk (US 2003/0060509 A1) in view of Corley et al. (US 6,399,803 B1). The teachings of Van Elswyk are disclosed above.

Regarding claim 55, Van Elswyk does not disclose that the triglyceride fraction contains "at least about" 20% of a triglyceride that has DHA residues at the sn-1 and sn-2 positions. Corley et al. disclose that a triglyceride containing DHA at two adjacent positions on the glycerol backbone, the compound of Formula I, is the most important triglyceride in algal oil (from a golden marine microalga). This triglyceride is beneficial in treating cardiovascular disease and inflammatory diseases and may be added to infant formula to promote brain and retinal development and health (see col. 1, line 42, to col. 2, line 55; col. 3, lines 3-17; col. 4, lines 18-28; col. 5, lines 25-48; and Examples 1-2 in cols. 12-14). Corley et al. do not disclose the stereochemistry of the compound of Formula I. The terminal DHA residue may be at the sn-1 position or the sn-3 position, depending on the chirality of the second carbon in the glycerol

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backbone. But, Corley et al. disclose that DHA residues at the 1 and 2 positions, or at the 2 and 3 positions, yield a particularly valuable and therapeutic compound. Consequently, it would have been obvious to the artisan of ordinary skill at the time of the invention to use a triglyceride fraction containing the triglyceride of Formula I of Corley et al. in the composition of Van Elswyk. As discussed above, the range of “at least about 20%” is an indefinite range and can be any amount, e.g., 1%. Corley et al disclose that the predominant fatty acid in algal oil is DHA (40.9%), the second-most common being palmitic acid (22.8%), followed by DPA (16.2%). Thus, the artisan of ordinary skill at the time of the invention would have expected more than 1%, or “at least about 20%” of the triglycerides in the purified product of Corey et al. (derived from algal oil) to be those containing two DHA residues at the sn-1 and sn-2 positions.

In view of the foregoing, a holding of obviousness is required.

Double Patenting- Obviousness-type

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 obviousness-type 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); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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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 a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

With respect to the non-statutory double patenting rejection(s) made in this Office action, note as follows. The use of the terminology "defined in 35 U.S.C. §154 to §156 and §173" in a terminal disclaimer can result in the terminal disclaimer being found improper. To address this, note that a proper terminal disclaimer need only disclaim the patent's remaining "full statutory term" as defined in 35 U.S.C., without specifying 35 U.S.C. 154 and 173. This is so, because the "full statutory term" inherently is a statutorily defined item. Note that the above language corresponds to PTO/SB/25 (07-09) (reproduced at page 1400-120 in Revision 7 (July 2008) of the 8th edition of the MPEP), but the reference to 35 U.S.C. 154 and 173 has been deleted.

Accordingly, the following language would be deemed acceptable:

The owner*, _____, of _____ percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number _____, filed on _____, and as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

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Claims 51-60 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 24-35 of copending Application No. 12/729013. Although the conflicting claims 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 about” a particular amount, in which the fatty acid residues are predominantly DHA and in which little to none of the fatty acid residues are ARA. The dependent claims in each case recite a food product, such as an infant formula, comprising this oil. The numerical ranges in the claims are not definite limitations, as discussed above, and do not create different inventions. Therefore, these inventions are not patentably distinct.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 51-60 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 39-57 of copending Application No. 13/151014. Although the conflicting claims 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, in the same ratio in each claim set, and in which little to none of the fatty acid residues are ARA. 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.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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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.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSANNE KOSSON whose telephone number is (571)272-2923. The examiner can normally be reached on Mon., Thurs., Fri., 8:30-6:00, Tues., 8:30-2:00, Wed. off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. 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.

/Rosanne Kosson/
Primary Examiner, Art Unit 1652
2011-07-12

Notice of References Cited	Application/Control No. 12/407,687	Applicant(s)/Patent Under Reexamination APT ET AL.	
	Examiner ROSANNE KOSSON	Art Unit 1652	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2003/0060509	03-2003	Elswyk, Mary Van	514/560
*	B	US-6,399,803	06-2002	Corley et al.	554/191
	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	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.

d his

(FILE 'HOME' ENTERED AT 14:33:37 ON 08 JUL 2011)

FILE 'CAPLUS, BIOSIS' ENTERED AT 14:33:47 ON 08 JUL 2011
L1 450 S TRIGLYCERIDE (40N) (DHA OR DOCOSAHEXAENOIC)
L2 5 S L1(40N)(DPA OR DOCOSAPENTAENOIC)
L3 5 DUP REM L2 (0 DUPLICATES REMOVED)

FILE 'REGISTRY' ENTERED AT 14:53:00 ON 08 JUL 2011
L4 STRUCTURE UPLOADED
L5 1 S L4
L6 22 S L4 FULL

FILE 'CAPLUS' ENTERED AT 14:55:13 ON 08 JUL 2011
L7 85 S L6
E US20080026103/PN
L8 1 S E3
L9 0 S L8 AND L7
E US6399803/PN
L10 1 S E3
L11 0 S L10 AND L7
L12 64 S L7 AND (OIL OR MARINE OR ALGAE OR MICROALGAE OR HETEROTROPHI
L13 64 DUP REM L12 (0 DUPLICATES REMOVED)
L14 64 S L13
L15 32 S L13 NOT PATENT/DT
L16 32 S L15 AND PD<20090319
L17 3 S L3
L18 0 S L3 AND PATENT/DT
L19 64 S L13
L20 32 S L13 AND PATENT/DT
L21 28 S L20 AND AD<20090319

=> app. no. 12/407687

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	597	martek as.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/11 09:27
L2	137	1 and triglyceride	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/11 09:27
L3	111	2 and dha	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/11 09:27
L4	75	3 and dpa	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/11 09:28
L5	73	4 and oil	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/11 09:28
L6	47	5 and formula	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/11 09:28
S1	10	(7163811 7252979 7871809 7824892 7829129 7745183 7732170 7579174).pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 16:48
S2	57	(6812009 6372460 7897391 7629450 7718431 7560539 7897392 7799564 7879608 7897393 7902427 7902427 7906706 7601522 7803620 7626009 7217856).pn.	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 16:58
S3	1107	triglyceride near40 (dha or docosahexaenoic)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:06
S4	86	S3 near40 (docosapentaenoic or dpa)	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:08
S5	26	S4 near40 oil	US-PGPUB; USPAT; EPO, JPO; DERWENT	ADJ	ON	2011/07/07 17:08
S6	21	S5 and @ad<"20090319"	US-PGPUB; USPAT;	ADJ	ON	2011/07/07 17:12

			EPO, JPO, DERWENT			
S7	1107	triglyceride near40 (dha or docosahexaenoic)	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S8	66	S7 near40 (docosapentaenoic or dpa)	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S9	26	S8 near40 oil	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S10	21	S9 and @ad< '20090319"	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/07 18:38
S11	2	"7588791".pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 14:35
S12	2	"7588791".pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 14:36
S13	8	(6509178 690585Q 20040059142).pn.	US- PGPUB; USPAT; EPO, JPO, DERWENT	ADJ	ON	2011/07/08 15:40

EAST Search History (Interference)

<This search history is empty>

7/11/2011 9:39:58 AM

C:\Users\rkosson\Documents\EAST\Workspaces\12407687 search1.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

APT *et al.*

Appl. No.: 12/407,687

Filed: March 19, 2009

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of
Making and Uses Thereof**

Confirmation No.: 7806

Art Unit: 1652

Examiner: KOSSON, Rosanne

Atty. Docket: 2715.0030000/JUK/SAS/KPQ

**Reply to Restriction Requirement, Statement of the Substance of the
Interview, and
Preliminary Amendment Under 37 C.F.R. § 1.115**

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

Sir:

In reply to the Office Action dated May 4, 2011, requesting an election of one invention to prosecute in the above-referenced patent application, Applicants hereby elect to prosecute the invention of **Group 1**, represented by **claims 51-65**.

With respect to the election of species requirement concerning claim 55, Applicants elect the *sn*-1 and *sn*-2 positions in the triglyceride as the positions containing docosahexaenoic acid.

With respect to the election of species requirement concerning **Group I**, represented by claims 58-65, Applicants elect infant formula as the type of food.

These elections are made without prejudice to or disclaimer of the other claims or inventions disclosed and are made **without traverse**. Reconsideration and withdrawal of the Restriction Requirement, and consideration and allowance of all pending claims, are respectfully requested.

Amendments to the Claims begin on page 3.

Statement of the Substance of the Interview begins on page 9.

Remarks begin on page 10.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendment to the Claims

1. — 50. (canceled)
51. (previously presented) A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from about 0.5% by weight to about 6% by weight, and wherein the oil comprises about 5% by weight or less of heptadecanoic acid.
52. (previously presented) The microbial oil of claim 51, further comprising an arachidonic acid content of the triglyceride fraction of about 1.5% or less by weight.
53. (previously presented) A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than about 6:1, and wherein the oil comprises about 5% by weight or less of heptadecanoic acid.
54. (previously presented) A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 60% by weight, and wherein the oil comprises about 5% by weight or less of heptadecanoic acid.
55. (previously presented) The microbial oil of any one of claims 51 to 54, wherein at least about 20% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions.

56. (previously presented) The microbial oil of any one of claims 51 to 54, wherein at least about 5% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at all three of the *sn*-1, *sn*-2, and *sn*-3 positions in the triglyceride.
57. (previously presented) A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the microbial oil of any one of claims 51 to 54.
58. (previously presented) The food product of claim 57, wherein the food product is an infant formula.
59. (previously presented) The food product of claim 58, wherein the infant formula is suitable for premature infants.
60. (previously presented) The food product of claim 57, wherein the food product is milk, a beverage, a therapeutic drink, a nutritional drink, or a combination thereof.
61. (previously presented) The food product of claim 57, wherein the food product is an additive for animal or human food.
62. (previously presented) The food product of claim 57, wherein the food product is a nutritional supplement.
63. (previously presented) The food product of claim 57, wherein the food product is an animal feed.
64. (previously presented) The animal feed of claim 63, wherein the animal feed is an aquaculture feed.
65. (previously presented) The animal feed of claim 63, wherein the animal feed is a domestic animal feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.

66. (new) An isolated thraustochytrid microorganism of the thraustochytrid species deposited under ATCC Accession No. PTA-9695 or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
67. (new) An isolated thraustochytrid microorganism having the characteristics of the thraustochytrid species deposited under ATCC Accession No. PTA-9695, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
68. (new) An isolated thraustochytrid microorganism, or a strain derived therefrom, comprising a triglyceride fraction, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, and wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight of eicosapentaenoic acid.
69. (new) An isolated thraustochytrid microorganism of the same species as the thraustochytrid deposited under ATCC Accession No. PTA-9695, or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
70. (new) The isolated thraustochytrid microorganism of any one of claims 66 to 69, wherein the strain derived therefrom is a mutant strain.
71. (new) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9695.
72. (new) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9696.
73. (new) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9697.

74. (new) An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9698.
75. (new) A thraustochytrid biomass comprising the thraustochytrid microorganism of any one of claims 66 to 74 or mixtures thereof.
76. (new) An isolated thraustochytrid biomass, wherein at least about 50% by weight of the dry cell weight of the biomass are fatty acids, and wherein at least about 50% by weight of the fatty acids are omega-3 fatty acids.
77. (new) The isolated thraustochytrid biomass of claim 76, wherein at least about 50% by weight of the fatty acids is docosahexaenoic acid.
78. (new) An isolated thraustochytrid biomass, wherein at least about 25% by weight of the dry cell weight of the biomass is docosahexaenoic acid.
79. (new) The isolated thraustochytrid biomass of any one of claims 75 to 78, wherein about 10% or less by weight of the fatty acids is eicosapentaenoic acid, and wherein the weight ratio of docosahexaenoic acid to eicosapentaenoic acid is at least about 5:1.
80. (new) The isolated thraustochytrid biomass of any one of claims 75 to 79, wherein about 1.5% or less by weight of the fatty acids is arachidonic acid, and wherein the weight ratio of docosahexaenoic acid to arachidonic acid is at least about 20:1.
81. (new) The isolated thraustochytrid biomass of any one of claims 75 to 80, further comprising docosahexaenoic acid and docosapentaenoic acid n-6 in a weight ratio of at least about 10:1.
82. (new) An isolated thraustochytrid culture comprising the thraustochytrid microorganism of any one of claims 66 to 74 or mixtures thereof.
83. (new) The isolated thraustochytrid culture of claim 82, further comprising at least about 5% dissolved oxygen.

84. (new) A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the thraustochytrid microorganism or thraustochytrid biomass of any one of claims 66 to 81 or mixtures thereof.
85. (new) A method for producing a microbial oil comprising omega-3 fatty acids, the method comprising:
 - (a) growing the isolated thraustochytrid microorganism of any one of claims 66 to 74 or mixtures thereof in a culture to produce a biomass, and
 - (b) extracting an oil comprising omega-3 fatty acids from the biomass.
86. (new) The method of claim 85, wherein the culture comprises at least about 5% dissolved oxygen.
87. (new) The method of claim 85, wherein the culture pH is maintained at about 6.5 to about 8.5.
88. (new) The method of claim 85, wherein the culture temperature is maintained at about 17 °C to about 30 °C.
89. (new) The method of claim 85, wherein the culture comprises a glucose concentration of about 5 g/L to about 50 g/L.
90. (new) A method for producing a microbial oil comprising omega-3 fatty acids, the method comprising extracting an oil comprising omega-3 fatty acids from the biomass of any one of claims 75 to 81.
91. (new) The method of claim 90, wherein the microbial oil comprising omega-3 fatty acids is extracted using a hexane extraction process.
92. (new) The method of claim 90, wherein the microbial oil comprising omega-3 fatty acids is extracted using a solventless extraction process.
93. (new) The method of any one of claims 85 to 92, or the isolated thraustochytrid culture of claim 82 or claim 83, wherein the dry cell weight of biomass isolated

from each liter of culture is at least about 50 g after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.

94. (new) The method of any one of claims 85 to 92, or the isolated thraustochytrid culture of claim 82 or claim 83, wherein the omega-3 fatty acids productivity is at least about 2 g/L/day after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.
95. (new) A microbial oil produced by the method of any one of claims 85 to 94.
96. (new) Use of the isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, for the manufacture of a medicament for the treatment of inflammation or a condition related thereto.
97. (new) Use of the isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, for the treatment of inflammation or a condition related thereto.
98. (new) The isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, for use in the treatment of inflammation or a condition related thereto.
99. (new) A method for treating inflammation or a condition related thereto in a subject in need thereof, comprising administering to the subject the isolated microorganism, biomass, or microbial oil of any one of claims 66 to 81, 51 to 56, 95, or mixtures thereof, and a pharmaceutically acceptable carrier.

Statement of the Substance of the Interview

Applicants thank Examiner Rosanne Kosson for extending the courtesy of a telephone interview with Applicants' representatives Katrina Quach and Scott A. Schaller on June 9, 2011. During the interview, the Restriction Requirements of March 21, 2011 and May 4, 2011 were discussed. In the response to the first Restriction Requirement filed on April 21, 2011, Applicants canceled non-elected claims and submitted new claims corresponding to the elected claims for the Examiner's convenience. Applicants fully intended to reserve the right to pursue the non-elected claims, which Applicants canceled, in divisional applications.

Subsequent to the filing of Applicants' response on April 21, 2011, Examiner Kosson issued a second Restriction Requirement on May 4, 2011, indicating that the first Restriction Requirement of March 21, 2011 has been vacated and replaced by this second Restriction Requirement. Applicants contacted Examiner Kosson to gain a clearer understanding of the second Restriction Requirement. Examiner Kosson indicated during the interview and in her Interview Summary of June 13, 2011, that the first Restriction Requirement of March 21, 2011 has not been withdrawn. Examiner Kosson stated that if the previously canceled claims were added back in an amendment, then those claims would be withdrawn as non-elected inventions in view of the response to the first Restriction Requirement filed on April 21, 2011.

Remarks

Upon entry of the foregoing amendments, claims 51-99 are pending in the application, with claims 51, 53, 54, 66-69, 71-74, 76, and 78 being the independent claims. Claims 1-50 were previously canceled without prejudice to or disclaimer of the subject matter therein. Applicants reserve the right to pursue any of the canceled subject matter. New claims 66-99 are sought to be added. Support for these new claims can be found, for example, in the original claims as filed. These changes are believed to introduce no new matter, and their entry is respectfully requested.

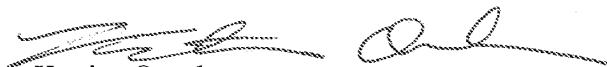
Based on the Examiner's comments in the Interview Summary dated June 13, 2011, Applicants understand that new claims 66-99, directed to the non-elected Groups set forth in the first Restriction Requirement, will be withdrawn by the Examiner.

Conclusion

Prompt and favorable consideration of this Reply to Restriction Requirement and Preliminary 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.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Katrina Quach
Attorney for Applicants
Registration No. 51,063

Date: July 5, 2011

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

1370736.1

Electronic Patent Application Fee Transmittal				
Application Number:	12407687			
Filing Date:	19-Mar-2009			
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof			
First Named Inventor/Applicant Name:	Kirk E. APT			
Filer:	Katrina Y.Pei Quach/Kim Perry			
Attorney Docket Number:	2715.0030000/JUK/SAS			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
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:				
Extension - 1 month with \$0 paid	1251	1	130	130

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				130

Electronic Acknowledgement Receipt	
EFS ID:	10455504
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Katrina Y.Pei Quach/Kim Perry
Filer Authorized By:	Katrina Y.Pei Quach
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	05-JUL-2011
Filing Date:	19-MAR-2009
Time Stamp:	20:06:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$130
RAM confirmation Number	6805
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1		27150030000.pdf	1453080 d28b008fc29f870fc32b0a10c518fd76caf12f53	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Miscellaneous Incoming Letter		1	1	
	Extension of Time		2	2	
	Response to Election / Restriction Filed		3	4	
	Claims		5	10	
	Applicant summary of interview with examiner		11	11	
	Applicant Arguments/Remarks Made in an Amendment		12	13	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30318 f87b66e21242bdaff8a599437b45c2b096db32e2	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1483398		
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					

KATRINA P. QUACH
ASSOCIATE*
(202) 772-8963
KQUACH@SKGF.COM



June 30, 2011

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

Confirmation No. 7806
Art Unit 1652
Mail Stop Amendment

Re: U.S. Utility Patent Application
Application No. 12/407,687; Filed: March 19, 2009
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making
and Uses Thereof**
Inventors: APT *et al.*
Our Ref: 2715.0030000/JUK/SAS/KPQ

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Online Credit Card Payment Authorization in the amount of **\$130.00** to cover the one-month extension of time fee;
2. Petition for Extension of Time Under 37 CFR 1.136(a); and
3. Reply to Restriction Requirement, Statement of the Substance of the Interview, and Preliminary Amendment Under 37 C.F.R. § 1.115.

The above-listed documents are being filed electronically through EFS-Web.

In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

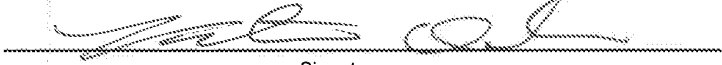
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Katrina Quach
Attorney for Applicants
Registration No. 51,063

SAS/KPQ
Enclosures

*Admitted only in Maryland

1382461_1.doc

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional)	
FY 2009 <small>{Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).}</small>		2715.0030000/JUK/SAS/KPQ	
Application Number 12/407,687		Filed March 19, 2009	
For Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof			
Art Unit 1652		Examiner KOSSON, Rosanne	
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):			
	<u>Fee</u>	<u>Small Entity Fee</u>	
☒ One month (37 CFR 1.17(a)(1))	\$130	\$65	\$ <u>130.00</u>
☐ Two months (37 CFR 1.17(a)(2))	\$490	\$245	\$ _____
☐ Three months (37 CFR 1.17(a)(3))	\$1110	\$555	\$ _____
☐ Four months (37 CFR 1.17(a)(4))	\$1730	\$865	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$2350	\$1175	\$ _____
☐ Applicant claims small entity status. See 37 CFR 1.27.			
☐ 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 <u>19-0036</u> .			
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/inventor.			
☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).			
☐ attorney or agent of record. Registration Number _____			
☒ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 <u>51,063</u>			
 _____ Signature		<u>July 5, 2011</u> _____ Date	
<u>Katrina Quach</u> _____ Typed or printed name		<u>(202) 371-2600</u> _____ Telephone Number	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
☐ Total of _____ 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: 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.

1383959.1

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 12/407,687		Filing Date 03/19/2009		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)		SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$	=		X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		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 \$250 (\$125 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			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT	07/05/2011	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 49	Minus	** 62	=	0		X \$52=	0	
	Independent (37 CFR 1.16(h))	* 10	Minus	*** 13	=	0		X \$220=	0	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE			TOTAL ADD'L FEE	0	
AMENDMENT	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			TOTAL ADD'L FEE		
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>										

Legal Instrument Examiner:
/ANGELONA JONES/

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.



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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806
26111 7590 06/13/2011 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER KOSSON, ROSANNE	
			ART UNIT	PAPER NUMBER
			1652	
			MAIL DATE	DELIVERY MODE
			06/13/2011	PAPER

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.

Interview Summary	Application No.	Applicant(s)
	12/407,687	APT ET AL.
	Examiner	Art Unit
	ROSANNE KOSSON	1652

All participants (applicant, applicant's representative, PTO personnel):

(1) <u>ROSANNE KOSSON.</u> (2) <u>Mr. Scott Schaller, Applicants' representative.</u>	(3) <u>Ms. Petrina Quatsch, Applicants' representative.</u> (4) _____.
--	---

Date of Interview: 09 June 2011.

Type: a) ☒ Telephonic b) ☐ Video Conference
 c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
 If Yes, brief description: _____.

Claim(s) discussed: those pending.

Identification of prior art discussed: none.

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See Continuation Sheet.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Rosanne Kosson/ Primary Examiner, Art Unit 1652	
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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The restriction requirement Office actions were discussed. Applicants were advised that a second Office action was sent because Applicants submitted a new claim set in response to the first Office action. The term "vacated" was discussed. Examiner explained that vacated means replaced completely. Vacated has to do with the way that Office actions in a case are counted in sequence by the Patent Office (if one action replaces another, the net is one Office action, not two, in the case). Applicants inquired as to whether or not the first restriction was still in force with respect to the different groups of canceled claims. If these canceled inventions were filed in divisional applications, could an ODP rejection be made? Examiner replied that the first restriction has not been withdrawn. Should the canceled claims be added back, they would be withdrawn. Applicants stated that they might file a much larger amended claim set, to include all of the canceled claims, so that these claims can be withdrawn. The larger claim set, Applicants feel, would give them better protection against ODP rejections. Applicants plan to file their response soon .



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806

26111 7590 05/04/2011
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

KOSSON, ROSANNE

ART UNIT	PAPER NUMBER
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1652

MAIL DATE	DELIVERY MODE
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05/04/2011

PAPER

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.

Office Action Summary	Application No.	Applicant(s)	
	12/407,687	APT ET AL.	
	Examiner	Art Unit	
	ROSANNE KOSSON	1652	

-- 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 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 April 2011.

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

3) ☐ 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

4) ☒ Claim(s) 51-65 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☐ Claim(s) _____ is/are rejected.

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

8) ☒ Claim(s) 51-65 are subject to restriction and/or election requirement.

Application Papers

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

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a) ☐ All b) ☐ Some * c) ☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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DETAILED ACTION

Election/Restrictions

Applicant's Response to the Office action of March 21, 2011 has been received and entered. The previous claim set has been canceled and replaced with a new claim set. As a result, the Office action of March 21, 2011 is vacated and replaced with this Office action. Should the instant claim set be replaced with another claim set, the restriction requirement will be revised or modified accordingly.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

1. Claims 51-65, drawn to a food product comprising an oil comprising at least about 70% triglycerides by weight, at least about 40% docosahexaenoic acid by weight and less than about 5% heptadecanoic acid, classified in class 426, subclass 601, and class 525, subclass 7.
2. Claims 51-57, drawn to a cosmetic product comprising an oil comprising at least about 70% triglycerides by weight, at least about 40% docosahexaenoic acid by weight and less than about 5% heptadecanoic acid, classified in class 424, subclass 401, and class 525, subclass 7.
3. Claims 51-57, drawn to a pharmaceutical product comprising an oil comprising at least about 70% triglycerides by weight, at least about 40% docosahexaenoic acid by weight and less than about 5% heptadecanoic acid, classified in class 514, subclass 558, and class 525, subclass 7.

The inventions are distinct, each from the other because of the following reasons:

Inventions 1 – 3 are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation,

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and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are each drawn to different compositions. Each composition has a different structure, different components, different biological and chemical properties, a different function and a different effect. Group 1 is a food, Group 2 is a cosmetic, Group 3 is a pharmaceutical composition. Therefore, these inventions are patentably distinct.

Claims 51, 53 and 54 link(s) inventions 1 – 3. The restriction requirement among the linked inventions is **subject to** the nonallowance of the linking claim(s). Upon the indication of allowability of the linking claim(s), the restriction requirement as to the linked inventions **shall be** withdrawn and any claim(s) depending from or otherwise requiring all the limitations of the allowable linking claim(s) will be rejoined and fully examined for patentability in accordance with 37 CFR 1.104. **Claims that require all the limitations of an allowable linking claim** will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

Applicant(s) are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, the allowable linking claim, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

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- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct,

Art Unit: 1652

applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

This application contains claims directed to the following patentably distinct species.

- A) Whichever Group is elected, in claim 55, Applicant must elect the two positions in the triglyceride that are esterified.
- B) If Group 1 is elected, the combination of claims 58-65 recites 14 different species. Each species is a different type of food. Applicants must elect one type of food listed in the claims. If Applicant elects a combination (see, e.g., claims 60 and 65), Applicant must indicate the exact number of food types in the combination and the exact identity of each item in the combination (e.g., a domestic animal feed and a livestock feed in claim 65).

The species are independent or distinct because each species has a different structure, different biological and chemical properties and a different function and effect. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, in (A) – (B) above for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 57 is generic.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;

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(b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

(d) the prior art applicable to one invention would not likely be applicable to another invention;

(e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

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Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSANNE KOSSON whose telephone number is (571)272-2923. The examiner can normally be reached on Mon., Thurs., Fri., 8:30-6:00, Tues., 8:30-2:00, Wed. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert B. Mondesi, can be reached on 571-272-0956. 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

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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.

/Rosanne Kosson/
Primary Examiner, Art Unit 1652
2011-04-29

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

APT *et al.*

Appl. No.: 12/407,687

Filed: March 19, 2009

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of
Making and Uses Thereof**

Confirmation No.: 7806

Art Unit: 1652

Examiner: KOSSON, Rosanne

Atty. Docket: 2715.0030000/JUK/SAS/KPQ

**Reply to Restriction Requirement and
Preliminary Amendment Under 37 C.F.R. § 1.115**

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

Sir:

In reply to the Office Action dated March 21, 2011, requesting an election of one invention to prosecute in the above-referenced patent application, Applicants hereby provisionally elect to prosecute the invention of **Group 25**, represented by **claims 51-56** submitted herewith in a Preliminary Amendment under 37 C.F.R. § 1.115. This election is made without prejudice to or disclaimer of the other claims or inventions disclosed.

This election is made **without traverse**. Reconsideration and withdrawal of the Restriction Requirement, and consideration and allowance of all pending claims, are respectfully requested.

Amendments to the Claims begin on page 2.

Remarks begin on page 4.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendment to the Claims

1, — 50. (canceled)

51. (new) A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 50% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from about 0.5% by weight to about 6% by weight, and wherein the oil comprises about 5% by weight or less of heptadecanoic acid.
52. (new) The microbial oil of claim 51, further comprising an arachidonic acid content of the triglyceride fraction of about 1.5% or less by weight.
53. (new) A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than about 6:1, and wherein the oil comprises about 5% by weight or less of heptadecanoic acid.
54. (new) A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 60% by weight, and wherein the oil comprises about 5% by weight or less of heptadecanoic acid.
55. (new) The microbial oil of any one of claims 51 to 54, wherein at least about 20% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions.

56. (new) The microbial oil of any one of claims 51 to 54, wherein at least about 5% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at all three of the *sn*-1, *sn*-2, and *sn*-3 positions in the triglyceride.
57. (new) A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the microbial oil of any one of claims 51 to 54.
58. (new) The food product of claim 57, wherein the food product is an infant formula.
59. (new) The food product of claim 58, wherein the infant formula is suitable for premature infants.
60. (new) The food product of claim 57, wherein the food product is milk, a beverage, a therapeutic drink, a nutritional drink, or a combination thereof.
61. (new) The food product of claim 57, wherein the food product is an additive for animal or human food.
62. (new) The food product of claim 57, wherein the food product is a nutritional supplement.
63. (new) The food product of claim 57, wherein the food product is an animal feed.
64. (new) The animal feed of claim 63, wherein the animal feed is an aquaculture feed.
65. (new) The animal feed of claim 63, wherein the animal feed is a domestic animal feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.

Remarks

Upon entry of the foregoing amendments, claims 51-65 are pending in the application, with claims 51, 53, and 54 being the independent claims. Claims 1-50 are sought to be canceled without prejudice to or disclaimer of the subject matter therein. Applicants reserve the right to pursue any of the canceled subject matter. New claims 51-65 are sought to be added. Support for these new claims can be found, for example, in the original claims as filed. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Conclusion

Prompt and favorable consideration of this Reply to Restriction Requirement and Preliminary 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.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Katrina Quach/

Katrina Quach
Attorney for Applicants
Registration No. 51,063

Date: April 21, 2011

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

1348931.1

Atty. Dkt. No. 2715.0030000/JUK/SAS/KPQ

Electronic Acknowledgement Receipt	
EFS ID:	9930369
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Katrina Y.Pei Quach/Roberta Jean Varshal
Filer Authorized By:	Katrina Y.Pei Quach
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	21-APR-2011
Filing Date:	19-MAR-2009
Time Stamp:	16:07:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	2715_0030000_coverletter_for _RRQ.pdf	106570 adcc19b0becdccc09293307dc6267eae8b 6b2fb	no	1

Warnings:

Information:

2		2715_0030000_Reply_RRQ.pdf	443674	yes	4
			2fe2dffc96681887d6e3328243a5bd30058279		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Response to Election / Restriction Filed		1	1	
	Claims		2	3	
	Applicant Arguments/Remarks Made in an Amendment		4	4	
Warnings:					
Information:					
Total Files Size (in bytes):			550244		
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					

KATRINA P. QUACH
ATTORNEY
(202) 772-8963
KQUACH@SKGF.COM



April 21, 2011

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

Confirmation No. 7806
Art Unit 1652
Attn: Mail Stop Amendment

Re: U.S. Utility Patent Application
Application No. 12/407,687; Filed: March 19, 2009
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making
and Uses Thereof**
Inventors: APT *et al.*
Our Ref: 2715.0030000/JUK/SAS/KPQ

Sir:

Transmitted herewith for appropriate action is a Reply to Restriction Requirement and Preliminary Amendment Under 37 C.F.R. § 1.115.

The above-listed document is being filed electronically through EFS-Web.

In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Katrina Quach/

Katrina Quach
Attorney for Applicants
Registration No. 51,063

SAS/KPQ:tjv
Enclosure

1352599_1.doc

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 12/407,687		Filing Date 03/19/2009		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)		SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			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 \$250 (\$125 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			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT	04/21/2011	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 40	Minus	** 62	= 0	X \$ =		OR	X \$52=	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 13	= 0	X \$ =		OR	X \$220=	0
	☐ Application Size Fee (37 CFR 1.16(s))							OR		
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0	
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))							OR		
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>										

Legal Instrument Examiner:
/THERESA LINDSAY/

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.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS	7806
26111 7590 03/21/2011 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER KOSSON, ROSANNE	
			ART UNIT 1652	PAPER NUMBER
			MAIL DATE 03/21/2011	DELIVERY MODE PAPER

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.

Office Action Summary	Application No.	Applicant(s)	
	12/407,687	APT ET AL.	
	Examiner	Art Unit	
	Rosanne Kosson	1652	

-- 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 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 22 June 2009.

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

3) ☐ 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

4) ☒ Claim(s) 1-50 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☐ Claim(s) _____ is/are rejected.

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

8) ☒ Claim(s) 1-50 are subject to restriction and/or election requirement.

Application Papers

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

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a) ☐ All b) ☐ Some * c) ☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

1. Claims 1-6, 10 and 14-18, drawn to the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof, classified in class 435, subclass 257.1.
2. Claims 7, 10 and 14-18, drawn to the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, classified in class 435, subclass 257.1.
3. Claims 8, 10 and 14-18, drawn to the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9697, classified in class 435, subclass 257.1.
4. Claims 9, 10 and 14-18, drawn to the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9698, classified in class 435, subclass 257.1.
5. Claims 10 and 14-18, drawn one or more mixtures of *Thraustochytriidae* microorganisms of ATCC Accession Nos. PTA-9695, 9696, 9697 and/or 9698, classified in class 435, subclass 257.1. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture.
6. Claims 11-16, drawn to a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid by weight, classified in class 435, subclass 257.1.
- 7-12. Claims 19, drawn to a food product comprising an organism or a mixture of organisms, classified in class 426, subclass 61. In Group 7, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a

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derivative thereof; in Group 8, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 11, the food product comprises the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 12, the food product comprises the thraustochytrid biomass.

13-18. Claims 19, drawn to a cosmetic product comprising an organism or a mixture of organisms, classified in class 424, subclass 401. In Group 13, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 14, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 17, the cosmetic product comprises the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 18, the cosmetic product comprises the thraustochytrid biomass.

19-24. Claims 19, drawn to a pharmaceutical product comprising an organism or a mixture of organisms, classified in class 424, subclass 93.7. In Group 19, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 20, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 23, the pharmaceutical product comprises the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 24, the pharmaceutical product comprises the thraustochytrid biomass.

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25. Claims 20-26, drawn to an oil comprising at least about 70% triglycerides by weight and at least about 40% docosahexaenoic acid by weight, classified in class 525, subclass 7.
26. Claims 27-35, drawn to food product or an infant formula containing an oil comprising at least about 70% triglycerides by weight and at least about 40% docosahexaenoic acid by weight, classified in class 426, subclass 601.
27. Claims 27, drawn to a cosmetic product containing an oil comprising at least about 70% triglycerides by weight and at least about 40% docosahexaenoic acid by weight, classified in class 424, subclass 401.
28. Claims 27, drawn to a pharmaceutical product containing an oil comprising at least about 70% triglycerides by weight and at least about 40% docosahexaenoic acid by weight, classified in class 514, subclass 1.
- 29-33. Claims 36-45, drawn to a method of making an oil comprising omega-3 fatty acids by culturing a microorganism and extracting the oil from the biomass from the culture, classified in class 435, subclass 134. In Group 29, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 30, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 33, the organism is the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture.
34. Claims 41-45, drawn to a method of making an oil comprising omega-3 fatty acids by extracting the oil from a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid

by weight, classified in class 210, subclass 634.

35-40. Claim 46, drawn to an oil containing omega-3 fatty acids made by a microorganism, classified in class 525, subclass 7. In Group 35, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 36, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 39, the organism is the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 40, the organism is part of a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid by weight.

41-53. Claim 47, drawn to the use of one microorganism or of a mixture of microorganisms or of a biomass or of an oil for making a medicament, the medicament having the intended use of treating inflammation or a condition related to inflammation, classified in class 435, subclass 134. In Group 41, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 42, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 45, the organism is the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 46, the organism is part of a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid by weight. In Groups 47-52, one oil is used to make the medicament. In Group 47, the organism that makes the oil is

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the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 48, the organism that makes the oil is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 51, the organism is the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 52, the organism is part of a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid by weight. In Group 53, the oil is an oil comprising at least about 70% triglycerides by weight and at least about 40% docosahexaenoic acid by weight.

- 54-66. Claims 48-50, drawn to the use of one microorganism or of a mixture of microorganisms or of a biomass or of an oil for treating inflammation or a condition related to inflammation, classified in class 514, subclass 1. In Group 54, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 55, the organism is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 58, the organism is the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 59, the organism is part of a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid by weight. In Groups 60-65, one oil is used to make the medicament. In Group 60, the organism that makes the oil is the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9695 or a derivative thereof; in Group 61, the organism that makes the oil is

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the *Thraustochytriida* microorganism of ATCC Accession No. PTA-9696, etc. In Group 64, the organism is the mixture of organisms. If this Group is elected, Applicant must indicate how many mixtures are in the elected invention and the exact identity of each organism in each mixture. In Group 65, the organism is part of a thraustochytrid biomass comprising at least about 50% fatty acids by weight and at least about 25% docosahexaenoic acid by weight. In Group 66, the oil is an oil comprising at least about 70% triglycerides by weight and at least about 40% docosahexaenoic acid by weight.

The inventions are distinct, each from the other because of the following reasons:

Inventions 1 – 28 and 35-40 are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are each drawn to different compositions. Each composition has a different structure, different components, different biological and chemical properties, a different function and a different effect. For example, Groups 1-5 are drawn to different microorganisms or mixtures of microorganisms. Group 6 is drawn to a biomass, a mixture of one or microorganisms and a variety of lipids. Groups 7-12 and 26 are drawn to different food products, each with a different microbial make-up and different lipid components. Groups 13-18 and 27 are drawn to different cosmetic products, each with a different microbial make-up and different lipid components. Groups 19-24 and 28 are drawn to different pharmaceutical products, each with a different microbial make-up and different lipid components. Group 25 is drawn to an oil, a nutraceutical. Groups 35-40 are drawn to different oils. Therefore, these inventions are patentably distinct.

Inventions 25 and each of 26 – 28 are related as subcombination and combination.

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Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because each of these inventions is a different product- Group 26 is a new food; Group 27 is a new cosmetic; Group 28 is a new pharmaceutical product. The subcombination has separate utility such as a neutraceutical that may be formulated on its own, e.g., as a soft gel, a syrup, an elixir or an emulsion.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Inventions 29 – 34 and 41-66 are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions are each drawn to a different method, each of which has different steps and different reagents, and a different function and a different effect. Each method uses a different microorganism or a different mixture or microorganisms, each of which grows differently and makes different products. Not all the methods require culturing one or more microorganisms (e.g., Group 34). Groups 29-34 are different methods of making an oil. Groups 41-53 are

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different methods of making a medicament. Groups 54-66 are different methods of treating inflammation. Therefore, these inventions are patentably distinct.

Invention 1 and inventions 29, 41 and 54 are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case the microorganism of Group 1 can be used in each of the three methods, to make an oil (the oil having use also as a nutritional supplement or a cosmetic supplement for humans or as a storage product for the organism that makes it), to make a medicament or to treat inflammation. Therefore, these inventions are patentably distinct. This relationship applies to inventions 2 and 30, 42 and 55; inventions 3 and 31, 43 and 56; inventions 4 and 32, 44 and 57; inventions 5 and 33, 45 and 58; and inventions 6 and 34, 46 and 59.

Invention 1 is not used in or required for inventions 30-34, 42-53 or 55-66. Therefore, these inventions are patentably distinct. This relationship applies to inventions 2 and 29, 31-34, 41, 43-53 and 56-66; inventions 3 and 29, 30, 32-34, 41, 42, 44-53, 54, 55 and 57-66; inventions 4 and 29, 30, 31, 33, 34, 41-43, 45-53, 54-56 and 58-66; inventions 5 and 29-32, 34, 41-44, 46-53, 54-57 and 59-66; and inventions 6 and 29-33, 41-45, 47-53, 54-58 and 60-66.

Invention 35 and inventions 47 and 60 are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case the oil of Group 35 can be used on its own (the oil having use also as a nutritional supplement or a cosmetic supplement for humans or as

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a storage product for the organism that makes it) or in each of the methods, to make a medicament or to treat inflammation. Invention 29 and invention 35 are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case process can be used to make a different product, a culture of the microalga, which can be used as food for fish or other marine animals or formulated into single cell protein, which can be used as food for humans. Therefore, these inventions are patentably distinct. This relationship applies to inventions 36 and 30, 48 and 61; inventions 37 and 31, 49 and 62; inventions 38 and 32, 50 and 63; inventions 39 and 33, 51 and 64; and inventions 40 and 34, 52 and 65; and inventions 25 and 53 and 66.

Invention 35 is not used in or required for inventions 30-34, 41-46, 48-53, 54-59 and 61-66. Therefore, these inventions are patentably distinct. This relationship applies to inventions 36 and 29, 31-34, 41-47, 49-53, 54-60 and 62-66; inventions 37 and 29, 30, 32-34, 41-48, 50-53, 54-61 and 63-66; inventions 38 and 29, 30, 31, 33, 34, 41-49, 54-62 and 64-66; inventions 39 and 29-32, 34, 41-50, 52-53, 54-63 and 65-66; inventions 40 and 29-33; 41-51, 53, 54-64 and 66; and inventions 25 and 41-52 and 54-65.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized

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divergent subject matter;

- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the

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evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

This application contains claims directed to the following patentably distinct species. If Applicant elects one of the food products of one of Groups 7-12, Applicant must elect one species as the type of food- an infant formula (claims 28-32) or a food for aquaculture (claim 34) or an animal food (claims 31, 33 and 35). The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record. Each type of food has a different structure and is given to a different animal to eat or drink. Claims 28-35 will be examined or withdrawn in accordance with the species election.

If Applicant elects one of the methods of one of Groups 29-34, Applicant must elect either the hexane extraction method of claim 42 or the solvent-free extraction method of claim 43. These are different steps that use different reagents and have different effects. The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 27 and 41 are generic.

There is an examination and search burden for these patentably distinct species due to their mutually exclusive characteristics. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and/or the prior art applicable to one species would not likely be applicable to another species; and/or the species are likely to raise different non-prior art issues under 35 U.S.C. 101

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and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election of the species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

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application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosanne Kosson whose telephone number is (571)272-2923. The examiner can normally be reached on Mon., Thurs., Fri., 8:30-6:00, Tues., 8:30-2:00, Wed. off.

Art Unit: 1652

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang, can be reached on 571-272-0811. 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.

/Rosanne Kosson/
Examiner, Art Unit 1652
2011-03-17



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS

CONFIRMATION NO. 7806

26111

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

PUBLICATION NOTICE



OC000000043666927

Title:Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof

Publication No.US-2010-0239533-A1

Publication Date:09/23/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/407,687	03/19/2009	1632	5994	2715.0030000/JUK/SAS	50	13

CONFIRMATION NO. 7806

UPDATED FILING RECEIPT



OC000000036668001*

26111

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

Date Mailed: 07/02/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Kirk E. APT, Ellicott City, MD;
Joseph W. Pfeifer III, Westminster, MD;
Jon Milton Hansen, Lexington, KY;
Paul Warren Behrens, Ellicott City, MD;
Ross Zirkle, Longmont, CO;
Tracey Lynn Stahl, Pasadena, MD;

Assignment For Published Patent Application

Martek Biosciences Corporation, Columbia, MD

Power of Attorney: The patent practitioners associated with Customer Number 26111

Domestic Priority data as claimed by applicant

Foreign Applications

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 04/16/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/407,687**

Projected Publication Date: 09/23/2010

Non-Publication Request: No

Early Publication Request: No

Title

Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof

Preliminary Class

435

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER**Title 35, United States Code, Section 184****Title 37, Code of Federal Regulations, 5.11 & 5.15****GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

page 2 of 3

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS

CONFIRMATION NO. 7806

POA ACCEPTANCE LETTER

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
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WASHINGTON, DC 20005



Date Mailed: 07/02/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/22/2009.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/ygizaw/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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*Admitted only in Maryland
*Admitted only in Virginia
•Practice Limited to
Federal Agencies

June 22, 2009

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

Mail Stop Missing Parts

Re: U.S. Utility Patent Application
Appl. No. 12/407,687; Filed: March 19, 2009
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making
and Uses Thereof**
Inventors: APT *et al.*
Our Ref: 2715.0030000/JUK/SAS

Sir:

In reply to the "Notice to File Missing Parts of Non-Provisional Application," dated April 21, 2009, Applicants transmit the following documents for appropriate action by the U.S. Patent and Trademark Office:

- Online Credit Card Payment Authorization for **\$5,994.00** to cover:

\$ 1,090.00	Patent Application fee (including basic filing, search and examination fees)
\$ 4,774.00	Excess claims fee
\$ 130.00	Surcharge for late filing fee or Declaration
- A copy of the original Declaration, executed by the inventors;
- An executed Power of Attorney to Prosecute (PTO/SB/80); and
- Statement Under 37 C.F.R. § 3.73(b).

The above-listed documents are filed electronically through EFS-Web.

Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment,

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June 22, 2009

Page 2

Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036. If extensions of time under 37 C.F.R. § 1.136 other than those otherwise provided for herewith are required to prevent abandonment of the present patent application, then such extensions of time are hereby petitioned, and any fees therefor are hereby authorized to be charged to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

A handwritten signature in black ink, appearing to read "Scott A. Schaller". The signature is stylized with a large, sweeping initial "S" and a distinct "A".

Scott A. Schaller
Attorney for Applicants
Registration No. 60,167

JUK/SAS/cs
Enclosures

995719_1.DOC

Declaration for Patent Application

Atty. Docket No. 2715.0030000/JUK/SAS

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter that is claimed and for which a patent is sought on the invention entitled **Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof**, the specification of which is attached hereto unless the following box is checked:

☒ was filed on March 19, 2009;
as United States Application Number or PCT International Application Number
12/407,687; and
was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Authorization to Permit Access to Application by Participating Offices

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO or other intellectual property office in which a foreign application claiming priority to the above-identified application is filed to have access to the application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the application-as-filed with respect to: 1) the above-identified application, 2) any foreign application to which the above-identified application claims priority under 35 USC 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified US application, and 3) any U.S. application from which benefit is sought in the above-identified application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

Claim of Foreign Priority Benefits

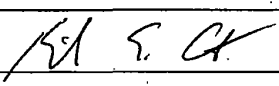
I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or (f) or § 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or § 365(a) of any PCT international application, which designated at least one country other than the United States of America, listed below, and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

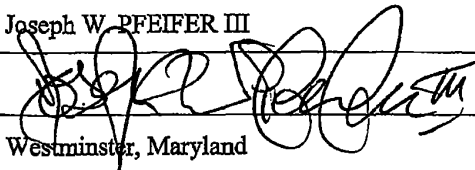
Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

Send Correspondence to: Customer No. 26111

Direct Telephone Calls to: (202) 371-2600

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first Inventor:	Kirk E. APT
Signature of first Inventor:	 Date: 4/20/09
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	3874 Paul Mill Road Ellicott City, Maryland 21042

Full name of second Inventor:	Joseph W. PFEIFER III
Signature of second Inventor:	 Date: 5/3/09
Residence:	Westminster, Maryland
Citizenship:	US
Mailing Address:	776 Nadines Court Westminster, Maryland 21157

Full name of third Inventor:	Jon Milton HANSEN
Signature of third Inventor:	Date:
Residence:	Lexington, Kentucky
Citizenship:	US
Mailing Address:	1184 Sheffield Place Lexington, Kentucky 40509

Full name of fourth Inventor:	Paul Warren BEHRENS
Signature of fourth Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	11413 Butterfruit Way Ellicott City, Maryland 21042

Full name of second Inventor:	Joseph W. PFEIFER III
Signature of second Inventor:	Date:
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Full name of third Inventor:	Jon Milton HANSEN
Signature of third Inventor:	Date: May 5, 2009
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Citizenship:	US
Mailing Address:	1184 Sheffield Place Lexington, Kentucky 40509

Full name of fourth Inventor:	Paul Warren BEHRENS
Signature of fourth Inventor:	Date:
Residence:	Ellicott City, Maryland
Citizenship:	US
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Full name of second Inventor:	Joseph W. PFEIFER III
Signature of second Inventor:	Date:
Residence:	Westminster, Maryland
Citizenship:	US
Mailing Address:	776 Nadines Court Westminster, Maryland 21157

Full name of third Inventor:	Jon Milton HANSEN
Signature of third Inventor:	Date:
Residence:	Lexington, Kentucky
Citizenship:	US
Mailing Address:	1184 Sheffield Place Lexington, Kentucky 40509

Full name of fourth Inventor:	Paul Warren BEHRENS
Signature of fourth Inventor:	<i>Paul Warren Behrens</i> Date: 4/28/09
Residence:	Ellicott City, Maryland
Citizenship:	US
Mailing Address:	11413 Butterfruit Way Ellicott City, Maryland 21042

Full name of fifth Inventor:	Ross ZIRKLE
Signature of fifth Inventor:	<i>Ross Zirkle</i> Date: 04/28/2009
Residence:	Longmont, Colorado
Citizenship:	US
Mailing Address:	974 Wolf Creek Drive Longmont, Colorado 80501

Full name of sixth Inventor:	Tracey Lynn STAHL
Signature of sixth Inventor:	Date:
Residence:	Pasadena, Maryland
Citizenship:	US
Mailing Address:	1016 Tennant Harbour Pasadena, Maryland 21122

963243_1.DOC

Full name of fifth Inventor:	Ross ZIRKLE
Signature of fifth Inventor:	Date:
Residence:	Longmont, Colorado
Citizenship:	US
Mailing Address:	974 Wolf Creek Drive Longmont, Colorado 80501

Full name of sixth Inventor:	Tracey Lynn STAHL
Signature of sixth Inventor:	Date: 9/28/09
Residence:	Pasadena, Maryland
Citizenship:	US
Mailing Address:	1016 Tennant Harbour Pasadena, Maryland 21122

963243_1.DOC

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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number:

26111

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number:

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OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone			Email

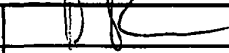
Assignee Name and Address:

Martek Biosciences Corporation
6480 Dobbin Road
Columbia, MD 21045

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	4/28/09
Name	David M. Feitel	Telephone	410-740-0081
Title	Senior Vice President, General Counsel and Secretary		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 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.

STATEMENT UNDER 37 CFR 3.73(b)

Atty. Dkt No. 2715.0030000/JUK/SAS

Applicant/Patent Owner: Martek Biosciences Corporation

Application No./Patent No.: 12/407,687 Filed/Issue Date: March 19, 2009

Titled: Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof

Martek Biosciences Corporation, a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 022799, Frame 0068, or for which a copy therefore is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

- ☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature

Scott A. Schaller

Printed or Typed Name

Date

June 22, 2009

Attorney

Title

This collection of information is required by 37 CFR 3.73(b). 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 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.

Electronic Patent Application Fee Transmittal				
Application Number:		12407687		
Filing Date:		19-Mar-2009		
Title of Invention:		Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof		
First Named Inventor/Applicant Name:		Kirk E. APT		
Filer:		Scott A. Schaller/Kim Perry		
Attorney Docket Number:		2715.0030000/JUK/SAS		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Claims in excess of 20	1202	42	52	2184
Independent claims in excess of 3	1201	10	220	2200
Multiple dependent claims	1203	1	390	390

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				5994

Electronic Acknowledgement Receipt

EFS ID:	5564859
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Scott A. Schaller/Kim Perry
Filer Authorized By:	Scott A. Schaller
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	22-JUN-2009
Filing Date:	19-MAR-2009
Time Stamp:	19:57:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 5994
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Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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Multipart Description/PDF files in .zip description					
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	Oath or Declaration filed	3	9		
	Power of Attorney	10	10		
	Assignee showing of ownership per 37 CFR 3.73(b).	11	11		
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Information:					
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<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					



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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/407,687	03/19/2009	Kirk E. APT	2715.0030000/JUK/SAS

CONFIRMATION NO. 7806

26111

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

FORMALITIES LETTER



OC000000035523700

Date Mailed: 04/21/2009

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$330 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).
- The oath or declaration is missing.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **\$4774** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of **\$130** for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$5994** for a non-small entity

- **\$330** Statutory basic filing fee.
- **\$130** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$540** to complete the search fee.

- The application examination fee has not been paid. Applicant must submit **\$220** to complete the examination fee for a non-small entity.
- Total additional claim fee(s) for this application is **\$4774**
 - **\$2200** for **10** independent claims over 3.
 - **\$2184** for **42** total claims over 20.
 - **\$390** for multiple dependent claim surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.

<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/nfissha/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/407,687	03/19/2009	1632	0.00	2715.0030000/JUK/SAS	50	13

CONFIRMATION NO. 7806

26111

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

FILING RECEIPT



0000000035523699

Date Mailed: 04/21/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Kirk E. APT, Ellicott City, MD;
Joseph W. Pfeifer III, Westminster, MD;
Jon Milton Hansen, Lexington, KY;
Paul Warren Behrens, Ellicott City, MD;
Ross Zirkle, Longmont, CO;
Tracey Lynn Stahl, Pasadena, MD;

Assignment For Published Patent Application

Martek Biosciences Corporation, Columbia, MD

Power of Attorney: None

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 04/16/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/407,687**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof

Preliminary Class

435

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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page 2 of 3

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

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Sequence Listing was accepted.
See attached Validation Report.
If you need help call the Patent Electronic Business Center at (866)
217-9197 (toll free).
Reviewer: Durreshwar Anjum
Timestamp: [year=2009; month=4; day=14; hr=12; min=19; sec=3; ms=406;]
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Validated By CRFValidator v 1.0.3

Application No: 12407687 Version No: 1.0

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Application Number: 12407687

Document Date: 03/19/2009

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Form Revision Date: February 8, 2006

UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	2715.0030000/JUK/SAS
	First Inventor	Kirk APT
	Title	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
	Express Mail Label No.	

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria VA 22313-1450
<p>1. ☐ Fee Transmittal Form (e.g., PTO/SB/17)</p> <p>2. ☐ Applicant claims small entity status. See 37 CFR 1.27.</p> <p>3. ☒ Specification [Total Pages <u>81</u>] Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a))</p> <p>4. ☐ Drawing(s) (35 U.S.C. 113) [Total Sheets _____]</p> <p>5. Oath or Declaration [Total Sheets _____] a. ☐ Newly executed (original or copy) b. ☐ A copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed) i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).</p> <p>6. ☒ Application Data Sheet. See 37 CFR 1.76</p> <p>7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) ☐ Landscape Table on CD</p> <p>8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. - c. are required) a. ☒ Computer Readable Form (CRF) b. ☐ Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☒ Paper c. ☐ Statements verifying identity of above copies</p>	ACCOMPANYING APPLICATION PARTS <p>9. ☐ Assignment Papers (cover sheet (PTO-1595) & document(s)) Name of Assignee <u>Martek Biosciences Corporation</u></p> <p>10. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney (when there is an assignee)</p> <p>11. ☐ English Translation Document (if applicable)</p> <p>12. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of foreign patent documents, publications, & other information</p> <p>13. ☐ Preliminary Amendment</p> <p>14. ☐ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)</p> <p>15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)</p> <p>16. ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.</p> <p>17. ☒ Other: <u>Authorization under 37 CFR 1.136(a)(3)</u></p>
<p>18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:</p> <p>☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____</p> <p>Prior application information: _____ Examiner: _____ Art Unit: _____</p>	
19. CORRESPONDENCE ADDRESS	
☒ The address associated with Customer Number: <u>26111</u> OR ☐ Correspondence address below	
Name _____	
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Country _____	Telephone _____ Email _____
Signature _____	Date <u>March 19, 2009</u>
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This collection of information is required by 37 CFR 1.53(b). 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 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.

DOC 946,778

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

APT *et al.*

Appl. No.: To be assigned

Filed: Herewith (March 19, 2009)

For: **Thraustochytrids, Fatty Acid
Compositions, and Methods of Making and
Uses Thereof**

Confirmation No.: To be assigned

Art Unit: To be assigned

Examiner: To be assigned

Atty. Docket: 2715.0030000/JUK/SAS

**Authorization to Treat a Reply as Incorporating an
Extension of Time Under 37 C.F.R. § 1.136(a)(3)**

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

Sir:

The U.S. Patent and Trademark Office is hereby authorized to treat any concurrent or future reply that requires a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. The U.S. Patent and Trademark Office is hereby authorized to charge all required extension of time fees to our Deposit Account No. 19-0036, if such fees are not otherwise provided for in such reply.

Respectfully submitted,

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Date: March 19, 2009

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946747_1.DOC

APPLICATION DATA SHEET

Electronic Version v14
Stylesheet Version v14.1

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Customer Number:	26111	*26111*
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Application Information:

Title of Invention: Thraustochytrids, Fatty Acid Compositions, and
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Attorney Docket Number: 2715.0300000/JUK/SAS

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26111 *26111*

as my attorney(s) or agent(s) to prosecute the application identified above, and to transact all
business in the United States Patent and Trademark Office connected therewith.

Domestic Priority Information:

Foreign Priority Information:

Assignee Information: Martek Biosciences Corporation

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946707_1.DOC

THRAUSTOCHYTRIDS, FATTY ACID COMPOSITIONS, AND METHODS OF MAKING AND USES THEREOF

REFERENCE TO A SEQUENCE LISTING SUBMITTED ELECTRONICALLY

[0001] The content of the electronically submitted sequence listing ("sequence listing.txt", 10,531 bytes, created on February 26, 2009) filed with the application is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention is directed to isolated thraustochytrid microorganisms as well as strains and mutants thereof. The invention is further directed to thraustochytrid biomasses, microbial oils, compositions, cultures, methods of producing the microbial oils, and methods of using the isolated thraustochytrids, biomasses, and microbial oils.

Background Art

[0003] Fatty acids are classified based on the length and saturation characteristics of the carbon chain. Short chain fatty acids generally have 12 carbons or less, medium chain fatty acids generally have 14 to 18 carbons, and long chain fatty acids generally have 20 or more carbons. Fatty acids are termed saturated fatty acids when no double bonds are present between the carbon atoms and are termed unsaturated fatty acids when double bonds are present. Unsaturated long chain fatty acids are monounsaturated when only one double bond is present and are polyunsaturated when more than one double bond is present.

[0004] Polyunsaturated fatty acids (PUFAs) are classified based on the position of the first double bond from the methyl end of the fatty acid: omega-3 (n-3) fatty acids contain a first double bond at the third carbon, while omega-6 (n-6) fatty acids contain a first double bond at the sixth carbon. For example, docosahexaenoic acid ("DHA") is an omega-3 long chain polyunsaturated fatty acid (LC-PUFA) with a chain length of 22 carbons and 6 double bonds, often designated as "22:6 n-3." Other omega-3 LC-PUFAs include eicosapentaenoic acid ("EPA"), designated as "20:5 n-3," and omega-3 docosapentaenoic acid ("DPA n-3"), designated as "22:5 n-3." DHA and EPA have been

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termed "essential" fatty acids. Omega-6 LC-PUFAs include arachidonic acid ("ARA"), designated as "20:4 n-6," and omega-6 docosapentaenoic acid ("DPA n-6"), designated as "22:5 n-6."

[0005] Omega-3 fatty acids are biologically important molecules that affect cellular physiology due to their presence in cell membranes, regulate production and gene expression of biologically active compounds, and serve as biosynthetic substrates. Roche, H. M., *Proc. Nutr. Soc.* 58: 397-401 (1999). DHA, for example, accounts for approximately 15%-20% of lipids in the human cerebral cortex, 30%-60% of lipids in the retina, is concentrated in the testes and sperm, and is an important component of breast milk. Jean-Pascal Bergé & Gilles Barnathan, *Fatty Acids from Lipids of Marine Organisms: Molecular Biodiversity, Roles as Biomarkers, Biologically Active Compounds, and Economical Aspects*, in *Marine Biotechnology I* 49 (T. Scheper, ed., 2005). DHA accounts for up to 97% of the omega-3 fatty acids in the brain and up to 93% of the omega-3 fatty acids in the retina. Moreover, DHA is essential for both fetal and infant development as well as maintenance of cognitive functions in adults. *Id.* Omega-3 fatty acids, including DHA and EPA, also possess anti-inflammatory properties. See, e.g., *Id.* and Simopoulos, A.P., *J. Am. Coll. Nutr.* 21: 495-595 (2002). Because omega-3 fatty acids are not synthesized de novo in the human body, these fatty acids must be derived from nutritional sources.

[0006] Flaxseed oil and fish oils are considered good dietary sources of omega-3 fatty acids. Flaxseed oil contains no EPA, DHA, DPA, or ARA but rather contains linolenic acid (C18:3 n-3), a building block enabling the body to manufacture EPA. There is evidence, however, that the rate of metabolic conversion can be slow and variable, particularly among those with impaired health. Fish oils vary considerably in the type and level of fatty acid composition depending on the particular species and their diets. For example, fish raised by aquaculture tend to have a lower level of omega-3 fatty acids than those in the wild. Furthermore, fish oils carry the risk of containing environmental contaminants and can be associated with stability problems and a fishy odor or taste.

[0007] Thraustochytrids are microorganisms of the order Thraustochytriales. Thraustochytrids include members of the genus *Schizochytrium* and have been recognized as an alternative source of omega-3 fatty acids, including DHA. See U.S. Patent No. 5,130,242. Oils produced from these marine heterotrophic microorganisms often have simpler polyunsaturated fatty acid profiles than corresponding fish or

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microalgal oils. Lewis, T.E., *Mar. Biotechnol.* 1: 580-587 (1999). Strains of thraustochytrid species have been reported to produce omega-3 fatty acids as a high percentage of the total fatty acids produced by the organisms. U.S. Patent No. 5,130,242; Huang, J. *et al.*, *J. Am. Oil. Chem. Soc.* 78: 605-610 (2001); Huang, J. *et al.*, *Mar. Biotechnol.* 5: 450-457 (2003). However, isolated thraustochytrids vary in the identity and amounts of LC-PUFAs produced, such that some previously described strains can have undesirable levels of omega-6 fatty acids and/or can demonstrate low productivity in culture. As such, a continuing need exists for the isolation of thraustochytrids demonstrating high productivity and desirable LC-PUFA profiles.

BRIEF SUMMARY OF THE INVENTION

[0008] The present invention is directed to an isolated thraustochytrid microorganism of the thraustochytrid species deposited under ATCC Accession No. PTA-9695 or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.

[0009] The present invention is also directed to an isolated thraustochytrid microorganism having the characteristics of the thraustochytrid species deposited under ATCC Accession No. PTA-9695, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.

[0010] The present invention is also directed to an isolated thraustochytrid microorganism, or a strain derived therefrom, comprising a triglyceride fraction, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, and wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.

[0011] The present invention is also directed to an isolated thraustochytrid microorganism of the same species as the thraustochytrid deposited under ATCC Accession No. PTA-9695, or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.

- [0012] In some embodiments, the strain derived from the isolated thraustochytrid microorganism of the invention is a mutant strain.
- [0013] The present invention is also directed to an isolated microorganism deposited under ATCC Accession No. PTA-9695, PTA-9696, PTA-9697, or PTA-9698.
- [0014] The present invention is also directed to a thraustochytrid biomass comprising any one of the thraustochytrid microorganisms of the invention or mixtures thereof.
- [0015] The present invention is also directed to an isolated thraustochytrid biomass, wherein at least about 50% by weight of the dry cell weight of the biomass are fatty acids, and wherein at least about 50% by weight of the fatty acids are omega-3 fatty acids. In some embodiments, at least about 50% by weight of the fatty acids is docosahexaenoic acid. The present invention is also directed to an isolated thraustochytrid biomass, wherein at least about 25% by weight of the dry cell weight of the biomass is docosahexaenoic acid.
- [0016] In some embodiments, the present invention is also directed to an isolated thraustochytrid biomass wherein about 10% or less by weight of the fatty acids is eicosapentaenoic acid, and wherein the weight ratio of docosahexaenoic acid to eicosapentaenoic acid is at least about 5:1.
- [0017] In some embodiments, the present invention is also directed to an isolated thraustochytrid biomass wherein about 1.5% or less by weight of the fatty acids is arachidonic acid, and wherein the weight ratio of docosahexaenoic acid to arachidonic acid is at least about 20:1.
- [0018] In some embodiments, the present invention is also directed to an isolated thraustochytrid biomass comprising docosahexaenoic acid and docosapentaenoic acid n-6 in a weight ratio of at least about 10:1.
- [0019] The present invention is also directed to an isolated thraustochytrid culture comprising any one of the thraustochytrid microorganisms of the invention or mixtures thereof. In some embodiments, the culture comprises at least about 5% dissolved oxygen.
- [0020] The present invention is also directed to a food product, cosmetic, or pharmaceutical composition for animals or humans comprising any one of the thraustochytrid microorganisms or biomasses of the invention or mixtures thereof.
- [0021] The present invention is also directed to a microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 50% by weight, and wherein the docosapentaenoic

acid n-6 content of the triglyceride fraction is from about 0.5% by weight to about 6% by weight. In some embodiments, the microbial oil further comprises an arachidonic acid content of the triglyceride fraction of about 1.5% or less by weight.

[0022] The present invention is also directed to a microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, and wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than about 6:1.

[0023] The present invention is also directed to a microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 60% by weight.

[0024] In some embodiments, at least about 20% of the triglycerides in the triglyceride fraction of the microbial oil contain docosahexaenoic acid at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions. In some embodiments, at least about 5% of the triglycerides in the triglyceride fraction of the microbial oil contain docosahexaenoic acid at all three of the *sn*-1, *sn*-2, and *sn*-3 positions in the triglyceride.

[0025] In some embodiments, the microbial oil further comprises about 5% or less by weight of heptadecanoic acid.

[0026] The present invention is also directed to a food product, cosmetic, or pharmaceutical composition for animals or humans comprising any of the microbial oils of the invention. In some embodiments, the food product is an infant formula. In some embodiments, the infant formula is suitable for premature infants. In some embodiments, the food product is a milk, a beverage, a therapeutic drink, a nutritional drink, or a combination thereof. In some embodiments, the food product is an additive for animal or human food. In some embodiments, the food product is a nutritional supplement. In some embodiments, the food product is an animal feed. In some embodiments, the animal feed is an aquaculture feed. In some embodiments, the animal feed is a domestic animal feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.

[0027] The present invention is also directed to a method for producing a microbial oil comprising omega-3 fatty acids, the method comprising: (a) growing any one of the

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isolated thraustochytrid microorganisms of the invention or mixtures thereof in a culture to produce a biomass, and (b) extracting an oil comprising omega-3 fatty acids from the biomass. In some embodiments, the culture comprises at least about 5% dissolved oxygen. In some embodiments, the culture pH is maintained at about 6.5 to about 8.5. In some embodiments, the culture temperature is maintained at about 17 °C to about 30 °C. In some embodiments, the culture comprises a glucose concentration of about 5 g/L to about 50 g/L.

[0028] The present invention is also directed to a method for producing a microbial oil comprising omega-3 fatty acids, the method comprising extracting an oil comprising omega-3 fatty acids from any one of the biomasses of the invention. In some embodiments, the microbial oil is extracted using a hexane extraction process. In some embodiments, the microbial oil is extracted using a solventless extraction process.

[0029] In some embodiments, the dry cell weight of the biomass isolated from each liter of any one of the cultures of the invention is at least about 50 g after growing for 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.

[0030] In some embodiments, any one of the isolated cultures of the invention has an omega-3 fatty acid productivity of at least about 2 g/L/day after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.

[0031] The present invention is also directed to a microbial oil produced by a method of the invention.

[0032] The present invention is also directed to use of any of the isolated microorganisms, biomasses, or microbial oils of the invention, or mixtures thereof, for the manufacture of a medicament for the treatment of inflammation or a condition related thereto.

[0033] The present invention is also directed to use of any of the isolated microorganisms, biomasses, or microbial oils of the invention, or mixtures thereof, for the treatment of inflammation or a condition related thereto.

- [0034] The present invention is also directed to any of the isolated microorganisms, biomasses, or microbial oils of the invention, or mixtures thereof, for use in the treatment of inflammation or a condition related thereto.
- [0035] The present invention is also directed to a method for treating inflammation or a condition related thereto in a subject in need thereof, comprising administering to the subject any of the isolated microorganisms, biomasses, or microbial oils of the invention, or mixtures thereof, and a pharmaceutically acceptable carrier.

DETAILED DESCRIPTION OF THE INVENTION

- [0036] The present invention is directed to isolated thraustochytrid microorganisms, as well as strains and mutants thereof, as well as biomasses, microbial oils, compositions, and cultures thereof. The present invention is also directed to methods of producing microbial oils from the thraustochytrids of the invention, and methods of using the thraustochytrids, biomasses, and microbial oils. The thraustochytrids described herein are highly productive as compared to prior isolates and produce unique fatty acid profiles, characterized in part by high levels of omega-3 fatty acids, in particular high levels of DHA.

Thraustochytrid Microorganisms

- [0037] The invention is directed to isolated thraustochytrids, including mutants, recombinants, and variants thereof.
- [0038] In some embodiments, the invention is directed to a thraustochytrid of the species deposited under ATCC Accession No. PTA-9695. The isolated thraustochytrid is also known herein as *Schizochytrium* sp. ATCC PTA-9695. The thraustochytrid associated with ATCC Accession No. PTA-9695 was deposited under the Budapest Treaty on January 7, 2009 at the American Type Culture Collection, Patent Depository, 10801 University Boulevard, Manassas, VA 20110-2209.
- [0039] In some embodiments, the invention is directed to an isolated thraustochytrid strain deposited under ATCC Accession No. PTA-9695. In some embodiments, the invention is directed to an isolated thraustochytrid microorganism of the same species as the thraustochytrid deposited under ATCC Accession No. PTA-9695.
- [0040] In some embodiments, the invention is directed to an isolated thraustochytrid having the characteristics of the species deposited under ATCC Accession No. PTA-9695
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or a strain derived therefrom. The characteristics of the thraustochytrid species deposited under ATCC Accession No. PTA-9695 include its growth and phenotypic properties (examples of phenotypic properties include morphological and reproductive properties), its physical and chemical properties (such as dry weights and lipid profiles), and its gene sequences. In some embodiments, the isolated thraustochytrids of the invention have substantially identical phenotypic properties of the thraustochytrid deposited under ATCC Accession No. PTA-9695. In some embodiments, the isolated thraustochytrids of the invention have substantially identical growth properties of the thraustochytrid deposited under ATCC Accession No. PTA-9695.

[0041] In some embodiments, the invention is directed to a mutant, variant, or recombinant of an isolated thraustochytrid of the invention, wherein the total fatty acids produced by the mutant, variant, or recombinant comprise about 10% or less by weight eicosapentaenoic acid. Mutant strains can be produced by well-known procedures. Common procedures include irradiation; treatment at high temperatures; and treatment with a mutagen. Variant strains can be other naturally occurring isolates and/or subisolates of the species described herein. Recombinant strains can be produced by any well-known methods in molecular biology for the expression of exogenous genes or the alteration of endogenous gene function or expression. In some embodiments, the mutant, variant, or recombinant strain produces a higher amount of omega-3 fatty acids, including DHA and/or EPA, than the wild-type strain. In some embodiments, the mutant, variant, or recombinant strain produces a lower amount of one or more fatty acids, such as lower amounts of EPA, ARA, DPA n-6, or combinations thereof. In some embodiments, the mutant, variant, or recombinant strain produces a larger dry cell weight per liter of culture than the wild-type strain. Such mutant, variant, or recombinant strains are examples of strains derived from an isolated thraustochytrid of the invention.

[0042] In some embodiments, the invention is directed to a mutant strain of the thraustochytrid deposited under ATCC Accession No. PTA-9695. In further embodiments, the mutant strain is a strain deposited under ATCC Accession Nos. PTA-9696, PTA-9697, or PTA-9698. The thraustochytrid strains associated with ATCC Accession Nos. PTA-9696, PTA-9697, and PTA-9698 were deposited under the Budapest Treaty on January 7, 2009 at the American Type Culture Collection, Patent Depository, 10801 University Boulevard, Manassas, VA 20110-2209. These deposited mutant strains are derivatives of the thraustochytrid deposited under ATCC Accession No. PTA-9695.

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[0043] In some embodiments, an isolated thraustochytrid of the invention, including mutants, variants, or recombinants thereof, comprises a fatty acid profile in one or more fractions isolated from the thraustochytrid. The one or more fractions isolated from the thraustochytrid includes the total fatty acid fraction, the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof.

Thraustochytrid Cultures and Isolated Thraustochytrid Biomasses

[0044] The invention is further directed to a culture comprising one or more isolated thraustochytrids of the invention. Various fermentation parameters for inoculating, growing, and recovering microflora are known in the art, such as described in U.S. Patent No. 5,130,242. Any conventional medium for growth of thraustochytrids can be used. Liquid or solid mediums can contain natural or artificial sea water. Carbon sources include, but are not limited to, glucose, fructose, xylose, saccharose, maltose, soluble starch, molasses, fucose, glucosamine, dextran, fats, oils, glycerol, sodium acetate, and mannitol. Nitrogen sources include, but are not limited to, peptone, yeast extract, polypeptone, malt extract, meat extract, casamino acid, corn steep liquor, organic nitrogen sources, sodium glutamate, urea, inorganic nitrogen sources, ammonium acetate, ammonium sulfate, ammonium chloride, ammonium nitrate, sodium sulfate. A typical media is shown in Table 1:

Table 1: Vessel Media

<u>Ingredient</u>	<u>concentration</u>	<u>ranges</u>
NaCl	g/L 12.5	0-25, 5-20, or 10-15
KCl	g/L 1.0	0-5, 0.25-3, or 0.5-2
MgSO ₄ ·7H ₂ O	g/L 5.0	0-10, 2-8, or 3-6
(NH ₄) ₂ SO ₄	g/L 0.6	0-10, 0.25-5, or 0.5-3
CaCl ₂	g/L 0.29	0.1-5, 0.15-3, or 0.2-1
T 154 (yeast extract)	g/L 6.0	0-20, 1-15, or 5-10
KH ₂ PO ₄	g/L 1.2	0.1-10, 0.5-5, or 1-3
<u>Post autoclave (Metals)</u>		
Citric acid	mg/L 3.5	0.1-100, 1-50, or 2-25
FeSO ₄ ·7H ₂ O	mg/L 10.30	0.1-100, 1-50, or 5-25
MnCl ₂ ·4H ₂ O	mg/L 3.10	0.1-100, 1-50, or 2-25
ZnSO ₄ ·7H ₂ O	mg/L 3.10	0.1-100, 1-50, or 2-25

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CoCl ₂ ·6H ₂ O	mg/L	0.04	0.001-1, 0.005-0.5, or 0.01-0.1
Na ₂ MoO ₄ ·2H ₂ O	mg/L	0.04	0.001-1, 0.005-0.5, or 0.01-0.1
CuSO ₄ ·5H ₂ O	mg/L	2.07	0.1-100, 0.5-50, or 1-25
NiSO ₄ ·6H ₂ O	mg/L	2.07	0.1-100, 0.5-50, or 1-25

Post autoclave (Vitamins)

Thiamine**	mg/L	9.75	0.1-100, 1-50, or 5-25
Vitamin B12**	mg/L	0.16	0.1-100, 0.1-10, or 0.1-1
Ca½-pantothenate**	mg/L	3.33	0.1-100, 0.1-50, or 1-10

Post autoclave (Carbon)

Glucose	g/L	30.0	5-150, 10-100, or 20-50
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Nitrogen Feed:

<u>Ingredient</u>	<u>Concentration</u>	
NH ₄ OH	mL/L	21.6 0-150, 10-100, or 15-50

Typical cultivation conditions would include the following:

pH	about 6.5 – about 8.5, about 6.5 – about 8.0, or about 7.0 - about 7.5
temperature:	about 17 – about 30 degrees Celsius, about 20 – about 25 degrees Celsius, or about 22 to about 23 degrees Celsius
dissolved oxygen:	about 5 – about 100% saturation, about 10 – about 80% saturation, or about 20 – about 50% saturation
glucose controlled @:	about 5 - about 50 g/L, about 10 – about 40 g/L, or about 20 – about 35 g/L.

[0045] In some embodiments, the culture medium comprises at least about 5%, at least about 10%, at least about 20%, at least about 30%, at least about 40%, at least about 50%, at least about 60%, at least about 70%, at least about 80%, or at least about 90% dissolved oxygen, as a percentage of saturation level. In some embodiments, the culture medium comprises from about 5% to about 20%, about 5% to about 50%, about 5% to about 100%, about 10% to about 20%, about 10% to about 50%, about 10% to about 100%, about 20% to about 50%, or about 20% to about 100% dissolved oxygen, as a percentage of saturation level.

[0046] The invention is further directed to an isolated biomass of a thraustochytrid of the invention. An isolated thraustochytrid biomass of the invention is a harvested cellular biomass obtained by any conventional method for the isolation of a thraustochytrid biomass, such as described in U.S. Patent No. 5,130,242 and U.S. Appl. Publ. No. 2002/0001833.

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[0047] In some embodiments, the dry cell weight of the biomass isolated from each liter of culture is at least about 50 g, at least about 60 g, at least about 70 g, at least about 80 g, at least about 100 g, at least about 120 g, at least about 140 g, at least about 160 g, at least about 180 g, or at least about 200 g after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about 8.5 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions. In some embodiments, the dry cell weight of the biomass isolated from each liter of culture is at least about 50 g, at least about 60 g, at least about 70 g, at least about 80 g, at least about 100 g, at least about 120 g, at least about 140 g, at least about 160 g, at least about 180 g, or at least about 200 g after growing for about 7 days at about 17°C, at about 18°C, at about 19°C, at about 20°C, at about 21°C, at about 22°C, at about 23°C, at about 24°C, at about 25°C, at about 26°C, at about 27°C, at about 28°C, at about 29°C, or at about 30°C in a culture medium of about pH 6.5, about pH 7, about pH 7.5, about pH 8.0, or about pH 8.5 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions. In some embodiments, the dry cell weight of the biomass isolated from each liter of culture is from about 50 g to about 200 g after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.5 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions. In some embodiments, the dry cell weight of the biomass isolated from each liter of culture is from about 50 g to about 200 g after growing for about 7 days at about 17°C, at about 18°C, at about 19°C, at about 20°C, at about 21°C, at about 22°C, at about 23°C, at about 24°C, at about 25°C, at about 26°C, at about 27°C, at about 28°C, at about 29°C, or at about 30°C in a culture medium of about pH 6.5, about pH 7, about pH 7.5, about pH 8.0, or about pH 8.5 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.

[0048] In some embodiments, the isolated thraustochytrid culture has an omega-3 fatty acid productivity of at least about 2 g/L/day, at least about 4 g/L/day, or at least about 8 g/L/day after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.5 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions. In some embodiments, the isolated thraustochytrid culture has an omega-3 fatty acid productivity of between about 1 g/L/day to about 20 g/L/day, about 2 g/L/day to about 15 g/L/day, about 2 g/L/day to about 10 g/L/day, about 3 g/L/day to about 10 g/L/day, or about 4 g/L/day to about 9 g/L/day,

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after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.5 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.

[0049] In some embodiments, the fermentation volume (volume of culture) is at least about 2 liters, at least about 10 liters, at least about 50 liters, at least about 100 liters, at least about 200 liters, at least about 500 liters, at least about 1000 liters, at least about 10,000 liters, at least about 20,000 liters, at least about 50,000 liters, at least about 100,000 liters, at least about 150,000 liters, at least about 200,000 liters, or at least about 250,000 liters. In some embodiments, the fermentation volume is about 2 liters to about 300,000 liters, about 2 liters, about 10 liters, about 50 liters, about 100 liters, about 200 liters, about 500 liters, about 1000 liters, about 10,000 liters, about 20,000 liters, about 50,000 liters, about 100,000 liters, about 150,000 liters, about 200,000 liters, about 250,000 liters, or about 300,000 liters.

[0050] In some embodiments, the invention is directed to an isolated thraustochytrid biomass comprising a fatty acid profile of the invention. In some embodiments, at least about 50%, at least about 60%, at least about 70%, or at least about 80% of the dry cell weight of the biomass are fatty acids. In some embodiments, greater than about 50%, greater than about 55%, or greater than about 60% of the dry cell weight of the biomass are fatty acids. In some embodiments, from about 50% to about 60%, about 50% to about 70%, about 50% to about 80%, about 55% to about 70%, about 55% to about 80%, about 60% to about 70%, or about 60% to about 80% by weight of the dry cell weight of the biomass are fatty acids. In some embodiments, the biomass comprises at least about 50%, at least about 60%, at least about 70%, or at least about 80% by weight of the fatty acids as omega-3 fatty acids. In some embodiments, the biomass comprises from about 50% to about 60%, about 50% to about 70%, about 50% to about 80% by weight of the fatty acids as omega-3 fatty acids. In some embodiments, the biomass comprises at least about 50%, at least about 55%, at least about 60%, at least about 65%, at least about 70%, at least about 75%, or at least about 80% by weight of the fatty acids as DHA. In some embodiments, the biomass comprises from about 50% to about 60%, about 50% to about 70%, or about 50% to about 80% by weight of the fatty acids as DHA. In some embodiments, at least about 25%, at least about 30%, at least about 40%, at least about 50%, or at least about 60% by weight of the dry cell weight of the biomass is docosahexaenoic acid. In some embodiments, about 25% to about 65%, about 25% to

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about 50%, about 30% to about 40%, or about 25% to about 35% by weight of the dry cell weight of the biomass is docosahexaenoic acid. In some embodiments, the biomass comprises about 10% or less, about 9% or less, about 8% or less, about 7% or less, about 6% or less, about 5% or less, about 4% or less, about 3% or less, about 2% or less, or about 1% or less by weight of the fatty acids as EPA. In some embodiments, the biomass comprises from about 1% to about 10%, about 1% to about 5%, about 2% to about 5%, about 3% to about 5%, or about 3% to about 10% by weight of the fatty acids as EPA. In some embodiments, the biomass is substantially free of EPA. In some embodiments, the biomass comprises a weight ratio of DHA to EPA of at least about 5:1, at least about 7:1, at least about 10:1, at least about 11:1, at least about 14:1, at least about 15:1, at least about 17:1, at least about 20:1, at least about 25:1, at least about 50:1, or at least about 100:1, wherein the biomass comprises about 10% or less by weight of the fatty acids as EPA. In some embodiments, the biomass comprises from about 0.1% to 0.2%, about 0.1% to about 0.3%, about 0.1% to about 0.4%, about 0.1% to about 0.5%, or about 0.1% to about 1.5% by weight of the fatty acids as ARA. In some embodiments, the biomass comprises about 1.5% or less, about 1% or less, about 0.5% or less, about 0.4% or less, about 0.3% or less, about 0.2% or less, or about 0.1% or less by weight of the fatty acids as ARA. In some embodiments, the biomass is substantially free of ARA. In some embodiments, the biomass comprises a weight ratio of DHA to ARA of at least about 20:1, at least about 40:1, at least about 60:1, at least about 80:1, at least about 100:1, at least about 150:1, at least about 200:1, at least about 250:1, or at least about 300:1. In some embodiments, the biomass comprises from about 0.5% to about 1%, about 0.5% to about 2%, about 0.5% to about 5%, about 0.5% to about 6%, about 1% to about 5%, about 1% to about 6%, about 2% to about 5%, or about 2% to about 6% by weight of the fatty acids as DPA n-6. In some embodiments, the biomass comprises about 6% or less, about 5% or less, about 2% or less, about 1% or less, or about 0.5% or less by weight of the fatty acids as DPA n-6. In some embodiments, the biomass is substantially free of DPA n-6. In some embodiments, the biomass comprises a weight ratio of DHA to DPA n-6 of greater than about 6:1, at least about 8:1, at least about 10:1, at least about 15:1, at least about 20:1, at least about 25:1, at least about 50:1, or at least about 100:1. In some embodiments, the biomass comprises fatty acids with about 5% or less, about 4% or less, about 3% or less, or about 2% or less by weight each of linoleic acid (18:2 n-6), linolenic acid (18:3 n-3), eicosenoic acid (20:1 n-9), and erucic acid (22:1 n-9).

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- [0051] The characteristics of an isolated biomass of the invention are associated with endogenous or native properties of the isolated biomass rather than exogenously introduced materials.

Microbial Oils

- [0052] The present invention is further directed to methods of producing microbial oils. In some embodiments, the method comprises growing a thraustochytrid of the invention in a culture to produce a biomass and extracting an oil comprising omega-3 fatty acids from the biomass. The oil can be extracted from a freshly harvested biomass or can be extracted from a previously harvested biomass that has been stored under conditions that prevent spoilage. Known methods can be used to culture a thraustochytrid of the invention, to isolate a biomass from the culture, to extract a microbial oil from the biomass, and to analyze the fatty acid profile of oils extracted from the biomass. *See, e.g.,* U.S. Patent No. 5,130,242.
- [0053] The invention is further directed to a microbial oil comprising a fatty acid profile of the invention. A microbial oil of the invention can be any oil derived from a microorganism, including, for example: a crude oil extracted from the biomass of the microorganism without further processing; a refined oil that is obtained by treating a crude microbial oil with further processing steps such as refining, bleaching, and/or deodorizing; a diluted microbial oil obtained by diluting a crude or refined microbial oil; or an enriched oil that is obtained, for example, by treating a crude or refined microbial oil with further methods of purification to increase the concentration of a fatty acid (such as DHA) in the oil.
- [0054] In some embodiments, the microbial oil comprises a sterol esters fraction of about 0%, at least about 0.1%, at least about 0.2%, at least about 0.5%, at least about 1%, at least about 1.5%, at least about 2%, or at least about 5% by weight. In some embodiments, the microbial oil comprises a sterol esters fraction of from about 0% to about 1.5%, about 0% to about 2%, about 0% to about 5%, about 1% to about 1.5%, about 0.2% to about 1.5%, about 0.2% to about 2%, or about 0.2% to about 5% by weight. In some embodiments, the microbial oil comprises a sterol esters fraction of less than about 5%, less than about 4%, less than about 3%, or less than about 2% by weight. In some embodiments, the microbial oil comprises a triglyceride fraction of at least about 65%, at least about 70%, at least about 75%, at least about 80%, at least about 85%, or at

least about 90% by weight. In some embodiments, the microbial oil comprises a triglyceride fraction of from about 65% to about 95%, about 75% to about 95%, or about 80% to about 95% by weight, or about 97% by weight, or about 98% by weight. In some embodiments, the microbial oil comprises a free fatty acid fraction of at least about 0.5%, at least about 1%, at least about 1.5%, at least about 2%, at least about 2.5%, or at least about 5% by weight. In some embodiments, the microbial oil comprises a free fatty acid fraction of from about 0.5% to about 5%, about 0.5% to about 2.5%, about 0.5% to about 2%, about 0.5% to about 1.5%, about 0.5% to about 1%, about 1% to about 2.5%, about 1% to about 5%, about 1.5% to about 2.5%, about 2% to about 2.5%, or about 2% to about 5% by weight. In some embodiments, the microbial oil comprises a free fatty acid fraction of less than about 5%, less than about 4%, less than about 3%, less than about 2%, or less than about 1% by weight. In some embodiments, the microbial oil comprises a sterol fraction of at least about 0.5%, at least about 1%, at least about 1.5%, at least about 2%, or at least about 5% by weight. In some embodiments, the microbial oil comprises a sterol fraction of from about 0.5% to about 1.5%, about 1% to about 1.5%, about 0.5% to about 2%, about 0.5% to about 5%, about 1% to about 2%, or about 1% to about 5% by weight. In some embodiments, the microbial oil comprises a sterol fraction of less than about 5%, less than about 4%, less than about 3%, less than about 2%, or less than about 1% by weight. In some embodiments, the microbial oil comprises a diglyceride fraction of at least about 1.5%, at least about 2%, at least about 2.5%, at least about 3%, at least about 3.5%, or at least about 5% by weight. In some embodiments, the microbial oil comprises a diglyceride fraction of from about 1.5% to about 3%, about 2% to about 3%, about 1.5% to about 3.5%, about 1.5% to about 5%, about 2.5% to about 3%, about 2.5% to about 3.5%, or about 2.5% to about 5% by weight. In some embodiments, the microbial oil comprises unsaponifiables of less than about 2%, less than about 1.5%, less than about 1%, or less than about 0.5% by weight of the oil. The lipid classes present in the microbial oil, such as the triglyceride fraction, can be separated by flash chromatography and analyzed by thin layer chromatography (TLC), or separated and analyzed by other methods known in the art.

[0055] In some embodiments, the microbial oil and/or one or more fractions thereof selected from the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, and combinations thereof, comprises at least about 40%, at least about 45%, at least about 50%, at least about 55%, at least about 60%, at least about 65%,

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at least about 70%, at least about 75%, or at least about 80% by weight DHA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, and combinations thereof, comprises from about 40% to about 45%, about 40% to about 50%, about 40% to about 60%, about 50% to about 60%, about 55% to about 60%, about 40% to about 65%, about 50% to about 65%, about 55% to about 65%, about 40% to about 70%, about 40% to about 80%, about 50% to about 80%, about 55% to about 80%, about 60% to about 80%, or about 70% to about 80% by weight DHA. In some embodiments, the microbial oil comprises a sterol esters fraction comprising about 45% or less, about 40% or less, about 35% or less, about 30% or less, about 25% or less, about 20% or less, about 15% or less, or about 13% or less by weight DHA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, and combinations thereof, comprises about 10% or less, about 9% or less, about 8% or less, about 7% or less, about 6% or less, about 5% or less, about 4% or less, about 3% or less, about 2% or less, or about 1% or less by weight EPA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, and combinations thereof, comprises from about 2% to about 3%, about 2% to about 3.5%, about 2.5% to about 3.5%, about 2% to about 6%, about 2.5% to about 6%, about 3.0% to about 6%, about 3.5% to about 6%, about 5% to about 6%, or about 2% to about 10% by weight EPA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, is substantially free of EPA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises a weight ratio of DHA to EPA of at least about 5:1, at least about 7:1, at least about 9:1, at least about 10:1, at least about 15:1, at least about 20:1, at least about 25:1, at least about 30:1, or at least about 50:1, wherein the microbial oil and/or one or more fractions thereof comprises 10% or less by weight of EPA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from

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the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises a weight ratio of DHA to EPA of at least about 5:1, but less than about 20:1. In some embodiments, the weight ratio of DHA to EPA is from about 5:1 to about 18:1, from about 7:1 to about 16:1, or from about 10:1 to about 15:1. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof comprises from about 0.1% to about 0.25%, about 0.2% to about 0.25%, about 0.1% to about 0.5%, or about 0.1% to about 1.5% by weight ARA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises about 1.5% or less, about 1% or less, about 0.5% or less, about 0.2% or less, or about 0.1% or less by weight ARA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, is substantially free of ARA. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises a weight ratio of DHA to ARA of at least about 20:1, at least about 30:1, at least about 35:1, at least about 40:1, at least about 60:1, at least about 80:1, at least about 100:1, at least about 150:1, at least about 200:1, at least about 250:1, or at least about 300:1. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises from about 0.5% to about 1%, about 0.5% to about 2%, about 0.5% to about 2.5%, about 0.5% to about 3%, about 0.5% to about 3.5%, about 0.5% to about 5%, about 0.5% to about 6%, about 1% to about 2%, about 2% to about 3%, about 2% to about 3.5%, about 1% to about 2.5%, about 1% to about 3%, about 1% to about 3.5%, about 1% to about 5%, or about 1% to about 6% by weight DPA n-6. In

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some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises about 6% or less, about 5% or less, about 3% or less, about 2.5% or less, about 2% or less, about 1% or less, or about 0.5% or less by weight DPA n-6. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, is substantially free of DPA n-6. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises a weight ratio of DHA to DPA n-6 of greater than about 6:1, of at least about 8:1, at least about 10:1, at least about 15:1, at least about 20:1, at least about 25:1, at least about 50:1, or at least about 100:1. In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises about 5% or less, about 4% or less, about 3% or less, about 2% or less, about 1.5% or less, about 1% or less, or about 0.5% or less by weight each of linoleic acid (18:2 n-6), linolenic acid (18:3 n-3), eicosenoic acid (20:1 n-9), and erucic acid (22:1 n-9). In some embodiments, the microbial oil and/or one or more fractions thereof selected from the sterol esters fraction, the triglyceride fraction, the free fatty acid fraction, the sterol fraction, the diglyceride fraction, the polar fraction (including the phospholipid fraction), and combinations thereof, comprises about 5% or less, about 4% or less, about 3% or less, about 2% or less, about 1.5% or less, or about 1% or less by weight of heptadecanoic acid (17:0). In some embodiments, the microbial oil and/or one or more fractions thereof comprise about 0.01% to about 5% by weight, about 0.05% to about 3% by weight, or about 0.1% to about 1% by weight of heptadecanoic acid.

[0056] The triglyceride molecule contains 3 central carbon atoms ($C_{sn-1}H_2R1-C_{sn-2}H_2R2-C_{sn-3}H_2R3$), allowing for formation of different positional isomers. In some embodiments, the microbial oil comprises a triglyceride fraction in which at least about 20%, at least about 30%, at least about 35%, or at least about 40% of the triglycerides in

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the triglyceride fraction contain DHA at two positions in the triglyceride (di-substituted DHA) selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions, based on the relative area percent of peaks on an HPLC chromatograph. In some embodiments, the microbial oil comprises a triglyceride fraction in which from about 20% to about 40%, about 20% to about 35%, about 30% to about 40%, or about 30% to about 35% of the triglycerides in the triglyceride fraction contain DHA at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, or *sn*-3 positions, based on the relative area percent of peaks on an HPLC chromatograph. In some embodiments, the microbial oil comprises a triglyceride fraction in which at least about 5%, at least about 10%, at least about 15%, or at least about 20% of the triglycerides in the triglyceride fraction contain DHA at all of the *sn*-1, *sn*-2, and *sn*-3 positions (tri-substituted DHA), based on the relative area percent of peaks on an HPLC chromatograph. In some embodiments, the microbial oil comprises a triglyceride fraction in which from about 5% to about 20%, about 5% to about 15%, about 10% to about 20%, or about 10% to about 15% of the triglycerides in the triglyceride fraction contain DHA at all of the *sn*-1, *sn*-2, and *sn*-3 positions, based on the relative area percent of peaks on an HPLC chromatograph. In contrast, the TAG species reported in U.S. Patent No. 6,582,941 does not contain DHA at all three positions. In some embodiments, the microbial oil comprises a triglyceride fraction in which at least about 50%, at least about 55%, at least about 60%, at least about 65%, at least about 70%, or at least about 75% of the triglycerides in the triglyceride fraction contain DHA at one position in the triglyceride selected from any one of the *sn*-1, *sn*-2, or *sn*-3 positions, based on the relative area percent of peaks on an HPLC chromatograph. In some embodiments, the microbial oil comprises a triglyceride fraction in which from about 50% to about 75%, about 50% to about 70%, about 50% to about 65%, about 60% to about 75%, about 60% to about 70%, or about 60% to about 65% of the triglycerides in the triglyceride fraction contain DHA at one position in the triglyceride selected from any one of the *sn*-1, *sn*-2, and *sn*-3 positions, based on the relative area percent of peaks on an HPLC chromatograph.

Compositions

[0057] The invention is further directed to compositions comprising a thraustochytrid of the invention, an isolated biomass of the invention, a microbial oil of the invention, or combinations thereof.

- [0058] A thraustochytrid, biomass, or microbial oil of the invention can be further chemically or physically modified or processed based on the requirements of the composition by any known technique.
- [0059] Thraustochytrid cells or biomasses can be dried prior to use in a composition by methods including, but not limited to, freeze drying, air drying, spray drying, tunnel drying, vacuum drying (lyophilization), or a similar process. Alternatively, a harvested and washed biomass can be used directly in a composition without drying. *See*, e.g., U.S. Patent Nos. 5,130,242 and 6,812,009.
- [0060] Microbial oils of the invention can be used as starting material to more efficiently produce a product enriched in a fatty acid such as DHA. For example, the microbial oils of the invention can be subjected to various purification techniques known in the art, such as distillation or urea adduction, to produce a higher potency product with higher concentrations of DHA or another fatty acid. The microbial oils of the invention can also be used in chemical reactions to produce compounds derived from fatty acids in the oils, such as esters and salts of DHA or another fatty acid.
- [0061] A composition of the invention can include one or more excipients. As used herein, "excipient" refers to a component, or mixture of components, that is used in a composition of the present invention to give desirable characteristics to the composition, including foods as well as pharmaceutical, cosmetic, and industrial compositions. An excipient of the present invention can be described as a "pharmaceutically acceptable" excipient when added to a pharmaceutical composition, meaning that the excipient is a compound, material, composition, salt, and/or dosage form which is, within the scope of sound medical judgment, suitable for contact with the tissues of human beings and animals without excessive toxicity, irritation, allergic response, or other problematic complications over the desired duration of contact commensurate with a reasonable benefit/risk ratio. In some embodiments, the term "pharmaceutically acceptable" means approved by a regulatory agency of the Federal or a state government or listed in the U.S. Pharmacopeia or other generally recognized international pharmacopeia for use in animals, and more particularly in humans. Various excipients can be used. In some embodiments, the excipient can be, but is not limited to, an alkaline agent, a stabilizer, an antioxidant, an adhesion agent, a separating agent, a coating agent, an exterior phase component, a controlled-release component, a solvent, a surfactant, a humectant, a buffering agent, a filler, an emollient, or combinations thereof. Excipients in addition to

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those discussed herein can include excipients listed in, though not limited to, *Remington: The Science and Practice of Pharmacy*, 21st ed. (2005). Inclusion of an excipient in a particular classification herein (e.g., "solvent") is intended to illustrate rather than limit the role of the excipient. A particular excipient can fall within multiple classifications.

[0062] Compositions of the invention include, but are not limited to, food products, pharmaceutical compositions, cosmetics, and industrial compositions.

[0063] In some embodiments, the composition is a food product. A food product is any food for animal or human consumption, and includes both solid and liquid compositions. A food product can be an additive to animal or human foods. Foods include, but are not limited to, common foods; liquid products, including milks, beverages, therapeutic drinks, and nutritional drinks; functional foods; supplements; nutraceuticals; infant formulas, including formulas for pre-mature infants; foods for pregnant or nursing women; foods for adults; geriatric foods; and animal foods.

[0064] In some embodiments, a thraustochytrid, biomass, or microbial oil of the invention can be used directly as or included as an additive within one or more of: an oil, shortening, spread, other fatty ingredient, beverage, sauce, dairy-based or soy-based food (such as milk, yogurt, cheese and ice-cream), a baked good, a nutritional product, e.g., as a nutritional supplement (in capsule or tablet form), a vitamin supplement, a diet supplement, a powdered drink, a finished or semi-finished powdered food product, and combinations thereof.

[0065] A partial list of food compositions that can include a microbial oil of the invention includes, but is not limited to, soya based products (milks, ice creams, yogurts, drinks, creams, spreads, whiteners); soups and soup mixes; doughs, batters, and baked food items including, for example, fine bakery wares, breakfast cereals, cakes, cheesecakes, pies, cupcakes, cookies, bars, breads, rolls, biscuits, muffins, pastries, scones, croutons, crackers, sweet goods, snack cakes, pies, granola/snack bars, and toaster pastries; candy; hard confectionery; chocolate and other confectionery; chewing gum; liquid food products, for example milks, energy drinks, infant formula, carbonated drinks, teas, liquid meals, fruit juices, fruit-based drinks, vegetable-based drinks; multivitamin syrups, meal replacers, medicinal foods, and syrups; powdered beverage mixes; pasta; processed fish products; processed meat products; processed poultry products; gravies and sauces; condiments (ketchup, mayonnaise, etc.); vegetable oil-based spreads; dairy products; yogurt; butters; frozen dairy products; ice creams; frozen desserts; frozen yogurts; semi-

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solid food products such as baby food; puddings and gelatin desserts; processed and unprocessed cheese; pancake mixes; food bars including energy bars; waffle mixes; salad dressings; replacement egg mixes; nut and nut-based spreads; salted snacks such as potato chips and other chips or crisps, corn chips, tortilla chips, extruded snacks, popcorn, pretzels, potato crisps, and nuts; specialty snacks such as dips, dried fruit snacks, meat snacks, pork rinds, health food bars and rice/corn cakes.

[0066] In some embodiments, a microbial oil of the invention can be used to supplement infant formula. Infant formula can be supplemented with a microbial oil of the invention alone or in combination with a physically refined oil derived from an arachidonic acid (ARA)-producing microorganism. An ARA-producing microorganism, for example, is *Mortierella alpina* or *Mortierella* sect. *schmuckeri*. Alternatively, infant formulas can be supplemented with a microbial oil of the invention in combination with an oil rich in ARA, including ARASCO® (Martek Biosciences, Columbia, MD).

[0067] In some embodiments, the composition is an animal feed. An "animal" means any non-human organism belonging to the kingdom Animalia, and includes, without limitation, aquatic animals and terrestrial animals. The term "animal feed" or "animal food" refers to any food intended for non-human animals, whether for fish; commercial fish; ornamental fish; fish larvae; bivalves; mollusks; crustaceans; shellfish; shrimp; larval shrimp; artemia; rotifers; brine shrimp; filter feeders; amphibians; reptiles; mammals; domestic animals; farm animals; zoo animals; sport animals; breeding stock; racing animals; show animals; heirloom animals; rare or endangered animals; companion animals; pet animals such as dogs, cats, guinea pigs, rabbits, rats, mice, or horses; primates such as monkeys (e.g., cebus, rhesus, African green, patas, cynomolgus, and cercopithecus), apes, orangutans, baboons, gibbons, and chimpanzees; canids such as dogs and wolves; felids such as cats, lions, and tigers; equids such as horses, donkeys, and zebras; food animals such as cows, cattle, pigs, and sheep; ungulates such as deer and giraffes; rodents such as mice, rats, hamsters and guinea pigs; and so on. An animal feed includes, but is not limited to, an aquaculture feed, a domestic animal feed including pet feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.

[0068] In some embodiments, the composition is a feed or feed supplement for any animal whose meat or products are consumed by humans, such as any animal from which meat, eggs, or milk is derived for human consumption. When fed to such animals,

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nutrients such as LC-PUFAs can be incorporated into the flesh, milk, eggs or other products of such animals to increase their content of these nutrients.

[0069] In some embodiments, the composition is a spray-dried material that can be crumbled to form particles of an appropriate size for consumption by zooplankton, artemia, rotifers, and filter feeders. In some embodiments, the zooplankton, artemia, or rotifers fed by the composition are in turn fed to fish larvae, fish, shellfish, bivalves, or crustaceans.

[0070] In some embodiments, the composition is a pharmaceutical composition. Suitable pharmaceutical compositions include, but are not limited to, an anti-inflammatory composition, a drug for treatment of coronary heart disease, a drug for treatment of arteriosclerosis, a chemotherapeutic agent, an active excipient, an osteoporosis drug, an anti-depressant, an anti-convulsant, an anti-Helicobacter pylori drug, a drug for treatment of neurodegenerative disease, a drug for treatment of degenerative liver disease, an antibiotic, a cholesterol lowering composition, and a triglyceride lowering composition. In some embodiments, the composition is a medical food. A medical food includes a food that is in a composition to be consumed or administered externally under the supervision of a physician and that is intended for the specific dietary management of a condition, for which distinctive nutritional requirements, based on recognized scientific principles, are established by medical evaluation.

[0071] In some embodiments, the microbial oil can be formulated in a dosage form. Dosage forms can include, but are not limited to, tablets, capsules, cachets, pellets, pills, powders and granules, and parenteral dosage forms, which include, but are not limited to, solutions, suspensions, emulsions, and dry powders comprising an effective amount of the microbial oil. It is also known in the art that such formulations can also contain pharmaceutically acceptable diluents, fillers, disintegrants, binders, lubricants, surfactants, hydrophobic vehicles, water soluble vehicles, emulsifiers, buffers, humectants, moisturizers, solubilizers, preservatives and the like. Administration forms can include, but are not limited to, tablets, dragees, capsules, caplets, and pills, which contain the microbial oil and one or more suitable pharmaceutically acceptable carriers.

[0072] For oral administration, the microbial oil can be combined with pharmaceutically acceptable carriers well known in the art. Such carriers enable the microbial oils of the invention to be formulated as tablets, pills, dragees, capsules, liquids, gels, syrups, slurries, suspensions and the like, for oral ingestion by a subject to be treated. In some

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embodiments, the dosage form is a tablet, pill or caplet. Pharmaceutical preparations for oral use can be obtained by adding a solid excipient, optionally grinding the resulting mixture, and processing the mixture of granules, after adding suitable auxiliaries, if desired, to obtain tablets or dragee cores. Suitable excipients include, but are not limited to, fillers such as sugars, including, but not limited to, lactose, sucrose, mannitol, and sorbitol; cellulose preparations such as, but not limited to, maize starch, wheat starch, rice starch, potato starch, gelatin, gum tragacanth, methyl cellulose, hydroxypropylmethyl cellulose, sodium carboxymethyl cellulose, and polyvinylpyrrolidone (PVP). If desired, disintegrating agents can be added, such as, but not limited to, the cross-linked polyvinyl pyrrolidone, agar, or alginic acid or a salt thereof such as sodium alginate. Pharmaceutical preparations that can be used orally include, but are not limited to, push-fit capsules made of gelatin, as well as soft, sealed capsules made of gelatin and a plasticizer, such as glycerol or sorbitol.

[0073] In some embodiments, the composition is a cosmetic. Cosmetics include, but are not limited to, emulsions, creams, lotions, masks, soaps, shampoos, washes, facial creams, conditioners, make-ups, bath agents, and dispersion liquids. Cosmetic agents can be medicinal or non-medicinal.

[0074] In some embodiments, the composition is an industrial composition. In some embodiments, the composition is a starting material for one or more manufactures. A manufacture includes, but is not limited to, a polymer; a photographic photosensitive material; a detergent; an industrial oil; or an industrial detergent. For example, U.S. Patent No. 7,259,006 describes use of DHA-containing fat and oil for production of behenic acid and production of photographic sensitive materials using behenic acid.

Methods of Using the Compositions

[0075] In some embodiments, the compositions can be used in the treatment of a condition in humans or animals.

[0076] The terms "treat" and "treatment" refer to both therapeutic treatment and prophylactic or preventative measures, wherein the object is to prevent or slow down (lessen) an undesired physiological condition, disease, or disorder, or to obtain beneficial or desired clinical results. For purposes of this invention, beneficial or desired clinical results include, but are not limited to, alleviation of the symptoms or signs associated with a condition, disease, or disorder; diminishment of the extent of a condition, disease, or

disorder; stabilization of a condition, disease, or disorder, (i.e., where the condition, disease, or disorder is not worsening); delay in onset or progression of the condition, disease, or disorder; amelioration of the condition, disease, or disorder; remission (whether partial or total and whether detectable or undetectable) of the condition, disease, or disorder; or enhancement or improvement of a condition, disease, or disorder. Treatment includes eliciting a clinically significant response without excessive side effects. Treatment also includes prolonging survival as compared to expected survival if not receiving treatment.

[0077] In some embodiments, the composition is used to treat a condition, disease, or disorder such as acne, acute inflammation, age related maculopathy, allergy, Alzheimer's, arthritis, asthma, atherosclerosis, autoimmune disease, blood lipid disorder, breast cysts, cachexia, cancer, cardiac restenosis, cardiovascular diseases, chronic inflammation, coronary heart disease, cystic fibrosis, degenerative disorder of the liver, diabetes, eczema, gastrointestinal disorder, heart disease, high triglyceride levels, hypertension, hyperactivity, immunological diseases, inhibiting tumor growth, inflammatory conditions, intestinal disorders, kidney dysfunction, leukemia, major depression, multiple sclerosis, neurodegenerative disorder, osteoarthritis, osteoporosis, peroxisomal disorder, preeclampsia, preterm birth, psoriasis, pulmonary disorder rheumatoid arthritis, risk of heart disease, or thrombosis.

[0078] In some embodiments, the composition is used to increase the length of gestation in the third trimester.

[0079] In some embodiments, the composition is used to control blood pressure.

[0080] In some embodiments, the composition is used to improve or maintain cognitive function.

[0081] In some embodiments, the composition is used to improve or maintain memory.

[0082] The composition or dosage form can be administered into the body of a subject by any route compatible with the composition or dosage form. A substance is considered to be "administered" if the substance is introduced into the body of the subject by the subject, or if another person, a machine, or a device introduces the substance into the body of the subject. "Administering," therefore, includes, e.g., self-administration, administration by others, and indirect administration. The term "continuous" or "consecutive," as used herein in reference to "administration," means that the frequency of administration is at least once daily. Note, however, that the frequency of

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administration can be greater than once daily and still be "continuous" or "consecutive," e.g., twice or even three times daily, as long as the dosage levels as specified herein are not exceeded. The means and methods for administration are known in the art and an artisan can refer to various pharmacologic references for guidance. For example, "Modern Pharmaceutics," Banker & Rhodes, Informa Healthcare, USA, 4th ed. (2002); and "Goodman & Gilman's The Pharmaceutical Basis of Therapeutics," McGraw-Hill Companies, Inc., New York, 10th ed. (2001) can be consulted.

[0083] By "subject," "individual," or "patient" is meant any subject, whether human or non-human, for whom diagnosis, prognosis, or therapy is desired. Mammalian subjects include, but are not limited to, humans; domestic animals; farm animals; zoo animals; sport animals; pet animals such as dogs, cats, guinea pigs, rabbits, rats, mice, or horses; primates such as monkeys (e.g., cebus, rhesus, African green, patas, cynomolgus, and cercopithecus), apes, orangutans, baboons, gibbons, and chimpanzees; canids such as dogs and wolves; felids such as cats, lions, and tigers; equids such as horses, donkeys, and zebras; food animals such as cows, cattle, pigs, and sheep; ungulates such as deer and giraffes; rodents such as mice, rats, hamsters and guinea pigs; and so on. The term subject also encompasses model animals, e.g., disease model animals. In some embodiments, the term subject includes valuable animals, either economically or otherwise, e.g., economically important breeding stock, racing animals, show animals, heirloom animals, rare or endangered animals, or companion animals. In certain embodiments, the subject is a human subject. In certain embodiments, the subject is a non-human subject.

[0084] The composition can be administered as a "therapeutically effective amount," a "prophylactically effective amount," a "therapeutic dose," or a "prophylactic dose." A "therapeutically effective amount" or "therapeutic dose" refers to an amount effective, at dosages and for periods of time necessary, to achieve a desired therapeutic result. A therapeutic result can be, e.g., lessening of symptoms, prolonged survival, improved mobility, and the like. A therapeutic result need not be a "cure." A "prophylactically effective amount" or "prophylactic dose" refers to an amount effective, at dosages and for periods of time necessary, to achieve the desired prophylactic result. Typically, since a prophylactic dose is used in subjects prior to or at an earlier stage of disease, a prophylactically effective amount will be less than a therapeutically effective amount for treatment of an advanced stage of disease.

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[0085] Various dosage amounts of the pharmaceutical composition can be administered to a subject, based on the amount of DHA or other fatty acid component of the thraustochytrid, biomass, or microbial oil to be administered to the subject. The terms "daily dosage," "daily dosage level," and "daily dosage amount" refer herein to the total amount of DHA or other fatty acid component administered per day (per 24 hour period). Thus, for example, administration of DHA to a subject at a daily dosage of 2 mg means that the subject receives a total of 2 mg of DHA on a daily basis, whether the DHA is administered as a single dosage form comprising 2 mg DHA, or alternatively, four dosage forms comprising 0.5 mg DHA each (for a total of 2 mg DHA). In some embodiments, the daily amount of DHA is administered in a single dosage form, or in two dosage forms. The dosage forms of the present invention can be taken in a single application or multiple applications. For example, if four tablets are taken daily, each tablet comprising 0.5 mg DHA, then all four tablets can be taken once daily, or 2 tablets can be taken twice daily, or 1 tablet can be taken every 6 hours. In some embodiments, the daily dosage is from about 100 mg to about 15 g of DHA. In some embodiments, the daily dosage is from about 100 mg to about 250 mg, about 100 mg to about 500 mg, about 100 mg to about 1 g, about 1 g to about 2.5 g, about 1 g to about 5 g, about 1 g to about 10 g, about 1 g to about 15 g, about 5 g to about 10 g, about 5 g to about 15 g, about 10 g to about 15 g, about 100 mg to about 10 g, about 100 mg to about 5 g, or about 100 mg to about 2.5 g.

[0086] Administration of the compositions or dosage forms of the present invention can be achieved using various regimens. For example, in some embodiments, administration occurs daily on consecutive days, or alternatively, occurs every other day (bi-daily). Administration can occur on one or more days.

[0087] Administration of the compositions and dosage forms can be combined with other regimens used for treatment of the condition. For example, the method of the present invention can be combined with diet regimens (e.g., low carbohydrate diets, high protein diets, high fiber diets, etc.), exercise regimens, weight loss regimens, smoking cessation regimens, or combinations thereof. The method of the present invention can also be used in combination with other pharmaceutical products in the treatment of the condition. The compositions or dosage forms of the present invention can be administered before or after other regimens or pharmaceutical products.

Kits Comprising the Compositions

- [0088] The invention is further directed to kits or packages containing one or more units of a composition of the invention. Kits or packages can include units of a food product, pharmaceutical composition, cosmetic, or industrial composition comprising the thraustochytrid, biomass, or microbial oil of the invention, or combinations thereof. Kits or packages can also include an additive comprising the thraustochytrid, biomass, or microbial oil of the invention, or combinations thereof for preparation of a food, cosmetic, pharmaceutical composition, or industrial composition.
- [0089] In some embodiments, the kit or package contains one or more units of a pharmaceutical composition to be administered according to the methods of the present invention. The kit or package can contain one dosage unit, or more than one dosage unit (i.e., multiple dosage units). If multiple dosage units are present in the kit or package, the multiple dosage units can be optionally arranged for sequential administration.
- [0090] The kits of the present invention can optionally contain instructions associated with the units or dosage forms of the kits. Such instructions can be in a form prescribed by a governmental agency regulating the manufacture, use or sale of pharmaceutical products, which notice reflects approval by the agency of the manufacture, use or sale for human administration to treat a condition or disorder. The instructions can be in any form which conveys information on the use of the units or dosage forms in the kit according to the methods of the invention. For example, the instructions can be in the form of printed matter, or in the form of a pre-recorded media device.
- [0091] In the course of examination of a patient, a medical professional can determine that administration of one of the methods of the present invention is appropriate for the patient, or the physician can determine that the patient's condition can be improved by the administration of one of the methods of the present invention. Prior to prescribing any regimen, the physician can counsel the patient, for example, on the various risks and benefits associated with the regimen. The patient can be provided full disclosure of all known and suspected risks associated with the regimen. Such counseling can be provided verbally, as well as in written form. In some embodiments, the physician can provide the patient with literature materials on the regimen, such as product information, educational materials, and the like.
- [0092] The present invention is also directed to methods of educating consumers about the methods of treatment, the method comprising distributing the dosage forms with

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consumer information at a point of sale. In some embodiments, the distribution will occur at a point of sale having a pharmacist or healthcare provider.

[0093] The term "consumer information" can include, but is not limited to, an English language text, non-English language text, visual image, chart, telephone recording, website, and access to a live customer service representative. In some embodiments, consumer information will provide directions for use of the dosage forms according to the methods of the present invention, appropriate age use, indication, contraindications, appropriate dosing, warnings, telephone number or website address. In some embodiments, the method further comprises providing professional information to relevant persons in a position to answer consumer questions regarding use of the disclosed regimens according to the methods of the present invention. The term "professional information" includes, but is not limited to, information concerning the regimen when administered according to the methods of the present invention that is designed to enable a medical professional to answer customer questions.

[0094] A "medical professional," includes, for example, a physician, physician assistant, nurse practitioner, pharmacist and customer service representative.

[0095] Having generally described this invention, a further understanding can be obtained by reference to the examples provided herein. These examples are for purposes of illustration only and are not intended to be limiting.

EXAMPLE 1

[0096] The isolated thraustochytrid deposited under ATCC Accession No. PTA-9695 was characterized for taxonomic classification.

[0097] Samples were collected from intertidal habitats during low tide. Water, sediment, living plant material and decaying plant/animal debris were placed into sterile 50 ml tubes. Portions of each sample along with the water were spread onto solid agar plates of isolation media. Isolation media consisted of: 500 ml of artificial seawater, 500 ml of distilled water, 1 g of glucose, 1 g of glycerol, 13 g of agar, 1 g of glutamate, 0.5 g of yeast extract, 0.5 g casein hydrolysate, 1ml of a vitamin solution (100 mg/L thiamine, 0.5 mg/L biotin, 0.5 mg B₁₂), 1 ml of a trace mineral solution (PII metals, containing per liter: 6.0 g FeCl₃6H₂O, 6.84 g H₃BO₃, 0.86 g MnCl₂4H₂O, 0.06 g ZnCl₂, 0.026 g CoCl₂6H₂O, 0.052 g NiSO₄H₂O, 0.002 g CuSO₄5H₂O and 0.005 g Na₂MoO₄2H₂O), and 500 mg each

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of penicillin G and streptomycin sulfate. The agar plates were incubated in the dark at 20-25°C. After 2-4 days the agar plates were examined under magnification, and colonies of cells were picked with a sterile toothpick and restreaked onto a fresh plate of media. Cells were repeatedly streaked onto fresh media until contaminated organisms were removed.

[0098] Colonies from agar plates were transferred to petri dishes with half-strength seawater and (1 ml) of a suspension of autoclaved newly hatched brine shrimp larvae. The brine shrimp larvae became heavily overgrown with clusters of sporangia after 2-3 days. Released zoospores were biflagellate at discharge, swimming actively away from the mature sporangium, wall remnants of which are clearly visible (in phase contrast) after spore release. Sporangia measured 12.5 µm to 25 µm in diameter, and zoospores were 2.5 µm to 2.8 µm x 4.5 µm to 4.8 µm in size. There were 8 to 24 spores per individual sporangium. Settled zoospores enlarged and rapidly underwent binary divisions leading to tetrads, octads, and finally to clusters of sporangia. Tetrad formation commenced at a very early stage prior to maturity of the sporangia. These characteristics are in agreement with the genus *Schizochytrium*.

[0099] The isolated thraustochytrid deposited under ATCC Accession No. PTA-9695 was further characterized based on the similarity of its 18s rRNA gene to that of known species. Total genomic DNA from the thraustochytrid deposited under ATCC Accession No. PTA-9695 was prepared by standard procedures (Sambrook J. and Russell D. 2001. Molecular cloning: A laboratory manual, 3rd edition. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York) and used for PCR amplification of the 18s RNA gene. The PCR amplification of the 18s rRNA gene was carried out with primers previously described (Honda *et. al.*, *J. Eukaryot. Microbiol.* 46(6) 1999). The PCR conditions with chromosomal DNA template were as follows: 0.2 µM dNTPs, 0.1 uM each primer, 8% DMSO, 200 ng chromosomal DNA, 2.5 U PfuUltra® II fusion HS DNA polymerase (Stratagene), and 1X PfuUltra® buffer (Stratagene) in a 50 µL total volume. The PCR Protocol included the following steps: (1) 95°C for 2 minutes; (2) 95°C for 45 seconds; (3) 55°C for 30 seconds; (4) 72°C for 2 minutes; (5) repeat steps 2-4 for 40 cycles; (6) 72°C for 5 minutes; and (7) hold at 6°C.

[0100] PCR amplification yielded a distinct DNA product with the expected size using chromosomal template described above. The PCR product was cloned into the vector

pJET1.2/blunt (Fermentas) according to the manufacturer's instructions, and the insert sequence was determined using supplied standard primers.

[0101] Table 2 shows a comparison of the 18s rRNA sequence from the thraustochytrid deposited under ATCC Accession No. PTA-9695 to DNA sequences in the National Center for Biotechnology Information (NCBI) electronic database. Briefly, "% Identity" was determined by the scoring matrix "swgapdnamt" within the "AlignX" program of the VectorNTI program (Invitrogen), a standard for DNA alignment. The "% Coverage" was taken from the results of a Basic Local Alignment Search Tool (BLAST) calculation from the NCBI electronic database and is the percent of the query length that is included in the aligned segments.

Table 2: Comparison of 18s rRNA Sequences

Thraustochytrids	% Identity Calculation #1	% Coverage Calculation #2
<i>Thraustochytrium aggregatum</i> (p)	98	90
<i>Thraustochutriidae</i> sp. HU1	84	86
<i>Thraustochutriidae</i> sp. 8-7	84	91
<i>Thraustochytrium multirudimentale</i>	81	88
<i>Thraustochutriidae</i> sp. PW19	81	85
<i>Schizochytrium</i> sp. ATCC 20888	81	95

(p): indicates partial sequence

[0102] As shown in Table 2, it was found that, in terms of % identity, the 18s rRNA gene sequence (SEQ ID NO: 1) from the thraustochytrid deposited under ATCC Accession No. PTA-9695 is closely related, though not identical, to the 18s rRNA gene sequence of *T. aggregatum* provided in Honda, D. *et al.*, *J. Euk. Micro.* 46(6): 637-647 (1999). The 18s rRNA sequence published for *Thraustochytrium aggregatum* is a partial sequence, with an approximately 71 DNA nucleotide gap in the middle of the sequence. In terms of percent coverage, the 18s rRNA gene sequence of the isolate of the invention is more closely related to *Schizochytrium* sp. ATCC 20888 than to *T. aggregatum*.

[0103] Highly conserved proteins such as actin and beta-tubulin have been widely used, along with 18s rRNA gene, as markers for assessing phylogenetic relationships between organisms (Baldauf, S. M. *Am. Nat.* 154, S178 (1999)). Total genomic DNA from the
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thraustochytrid deposited under ATCC Accession No. PTA-9695 was also used as a template for PCR amplification of both the actin and beta-tubulin genes. The PCR amplification was carried out with primers designed to conserved regions from the actin and beta-tubulin DNA sequences from *T. aggregatum*.

[0104] The PCR conditions with chromosomal DNA template were as follows: 0.2 μ M dNTPs, 0.1 μ M each primer, 8% DMSO, 200 ng chromosomal DNA, 2.5 U Herculase® II fusion DNA polymerase (Stratagene), and 1X Herculase® buffer (Stratagene) in a 50 μ L total volume. The PCR Protocol included the following steps: (1) 95°C for 2 minutes; (2) 95°C for 30 seconds; (3) 55°C for 30 seconds; (4) 72°C for 2 minutes; (5) repeat steps 2-4 for 40 cycles; (6) 72°C for 5 minutes; and (7) hold at 6°C.

[0105] PCR amplification yielded distinct DNA products with the expected sizes using chromosomal template described above. The respective PCR products were cloned into the vector pJET1.2/blunt (Fermentas) according to the manufacturer's instructions, and the insert sequence of each were determined using supplied standard primers.

[0106] Table 3 shows identities for the actin amino acid sequence (SEQ ID NO: 3) from the thraustochytrid deposited under ATCC Accession No. PTA-9695 as compared to actin sequences available in the public database. Identities were determined through use of the scoring matrix "blosum62mt2" within the "AlignX" program of the VectorNTI program, a standard for protein alignment.

Table 3: Comparison of Actin Protein Sequence % Identities

Thraustochytrids	% Identity
<i>Thraustochytriidae sp. RT49</i>	98
<i>Schizochytrium sp. ATCC 20888</i>	96
<i>Thraustochytrium striatum</i>	96
<i>Thraustochytrium aggregatum</i>	96
<i>Japonochytrium marinum</i>	95
<i>Thraustochytrium aureum</i>	95

[0107] Table 4 shows identities for the beta-tubulin amino acid sequence (SEQ ID NO: 5) from the thraustochytrid deposited under ATCC Accession No. PTA-9695 as compared to

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beta-tubulin sequences available in the public database. Identities were determined through use of the scoring matrix "blosum62mt2" within the "AlignX" program of the VectorNTI program, a standard for protein alignment.

Table 4: Comparison of Beta-Tubulin Protein Sequence % Identities

Thraustochytrids	% Identity
<i>Aplanochytrium kerguelense</i>	100
<i>Aplanochytrium stocchinoi</i>	100
<i>Japonochytrium marinum</i>	100
<i>Labyrinthula</i> sp. N8	100
<i>Thraustochytriidae</i> sp. RT49	100
<i>Thraustochytrium aggregatum</i>	100
<i>Thraustochytriidae</i> sp. HU1	100
<i>Thraustochytrium aureum</i>	100
<i>Thraustochytrium kinnei</i>	100
<i>Thraustochytriidae</i> sp. #32	100
<i>Thraustochytriidae</i> sp. PW19	100
<i>Schizochytrium aggregatum</i>	100
<i>Schizochytrium</i> sp. ATCC 20888	100

[0108] Based on the above characterizations, the isolated thraustochytrid deposited under ATCC Accession No. PTA-9695 is believed to represent a new *Schizochytrium* species and is therefore also designated as *Schizochytrium* sp. ATCC PTA-9695.

EXAMPLE 2

[0109] The isolated thraustochytrid deposited under ATCC Accession No. PTA-9695 produced high levels of cell growth under varying culture conditions, as described below. Typical media and cultivation conditions are shown in Table 1. Also, high levels of fatty acids and DHA were observed (i.e., greater than 50% by weight of the dry cell weight were fatty acids and greater than 50% by weight of the fatty acid methyl esters was DHA).

[0110] In carbon and nitrogen-fed cultures with 8200 ppm Cl⁻ at 22.5 °C with 20% dissolved oxygen at pH 7.0, the isolate produced a dry cell weight of 140 g/L after 7 days

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of culture, with a fatty acid content of 70% by weight. Closed loop ammonia feed was used and the pH was maintained at 7.0. The omega-3 productivity was 8.92 g/(L*day) under these conditions, with 4.7 g/L EPA (5% by weight of fatty acids) and 56.3 g/L DHA (57% by weight of fatty acids) in 7 days.

[0111] In carbon and nitrogen-fed cultures with 3640 ppm Cl^- at 22.5 °C with 20% dissolved oxygen at pH 7.0, the isolate produced a dry cell weight of 82 g/L after 7 days of culture, with a fatty acid content of 58% by weight. The omega-3 productivity was 4.5 g/(L*day) under these conditions, with 2.1 g/L EPA (4.3% by weight of fatty acids) and 28.5 g/L DHA (58.7% by weight of fatty acids) in 7 days.

[0112] In carbon and nitrogen-fed cultures with 980 ppm Cl^- at 22.5 °C with 20% dissolved oxygen at pH 7.0, the isolate produced a dry cell weight of 60 g/L after 7 days of culture, with a fatty acid content of 53% by weight. The omega-3 productivity was 2.8 g/(L*day) under these conditions, with 1.1 g/L EPA (3.4% by weight of fatty acids) and 18.4 g/L DHA (56.8% by weight of fatty acids) in 7 days.

EXAMPLE 3

[0113] Oils were extracted from a biomass sample (Sample A) of the isolated thraustochytrid deposited under ATCC Accession No. PTA-9695. The biomass sample was produced in a carbon and nitrogen-fed culture with 980 ppm Cl^- at 22.5 °C with 20% dissolved oxygen at pH 7.0. Oils were extracted from biomass Sample A by the hexane extraction process to yield microbial oil Sample A1. Briefly, dried biomass was ground with hexane using stainless steel tubes and stainless steel ball bearings for approximately 2 hours. The slurry was vacuum filtered and the filtrate was collected. The hexane was removed using a rotary evaporator. Oils were also extracted from biomass Sample A using the FRIOLEX® process (GEA Westfalia Separator UK Ltd., Milton Keynes, England) to yield microbial oil Sample A2. Individual lipid classes were isolated from microbial oil Samples A1 and A2 using low pressure flash chromatography, and the weight percent of each class was determined. The fatty acid profile of each class was determined using gas chromatography with flame ionization detection (GC-FID) as fatty acid methyl esters (FAME).

[0114] *Flash Chromatography* – Flash chromatography was used to separate the lipid classes present in the crude oils, and to determine the weight percent of each class present

in the oils. The chromatography system utilized Silica Gel 60 (EMD Chemical, Gibbstown, NJ) with mobile phase composed of Petroleum Ether and Ethyl Acetate at 3 mL/min. A step gradient was used to selectively elute each lipid class from the column. The mobile phase gradient started from 100% petroleum ether and finished with 50% ethyl acetate (followed by a 100% methanol wash). Fractions were collected in 10 mL test tubes using a Gilson FC 204 large-bed fraction collector (Gilson, Inc., Middleton, WI). Each tube was analyzed by thin layer chromatography (TLC) and the tubes containing individual lipid classes (as judged by single spots on TLC plate with expected retention factor (Rf)) were pooled, concentrated to dryness, and weighed. The total fraction content was then determined gravimetrically.

[0115] *TLC Analysis* – Thin layer chromatography was conducted on silica gel plates. The plates were eluted using a solvent system consisting of petroleum ether : ethyl ether : acetic acid (80:20:1) and were visualized using iodine vapor. The Rf values of each spot were then compared with reported literature values for each lipid class.

[0116] *Fatty Acid Analysis* – The samples of biomass and isolated lipid classes were analyzed for fatty acid composition as FAMES. Samples were weighed directly into screw cap test tubes, and 1 mL of C19:0 internal standard (NuCheck, Elysian, MN) in toluene and 2 mL of 1.5 N HCl in methanol was added to each tube. The tubes were vortexed briefly and placed in a heating block for 2 hours at 100° C. The tubes were removed from the heating block, allowed to cool, and 1 mL of saturated NaCl in water was added. The tubes were vortexed again, centrifuged, and a portion of the top (organic) layer was placed in a GC vial and analyzed by GC-FID. FAME's were quantified using a 3-point internal standard calibration curve generated using Nu-Chek-Prep GLC reference standard (Nu-Chek Prep, Inc., Elysian, MN) and tentatively identified based on retention time. Fatty acids present were expressed as mg/g and % of total FAME.

[0117] Sample A1 was prepared by dissolving the crude oil in hexane and applying to the head of the column. After fractionation of the sample using flash chromatography, the sterol ester fraction accounted for 1.2% by weight, the triacylglycerol (TAG) fraction accounted for 82.7% by weight, the free fatty acid (FFA) fraction accounted for 0.9% by weight, and the diacylglycerol (DAG) fraction accounted for 2.9% by weight of the crude oil. The total fatty acid profiles of the Sample A1 crude oil and isolated fractions are shown below in Table 5 and Table 6 calculated as mg/g and %FAME, respectively.

Table 5: Sample A1 Fatty Acid Profiles Calculated as Milligrams per Gram FAME

	Biomass	Crude Oil	Sterol Esters	TAG	FFA	DAG
Wt. %	NA	38%	1.2%	82.7%	0.9	2.9%
Fatty Acid	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)
C12:0*	0.6	0.0	1.9	3.2	1.7	0.0
C14:0*	5.7	13.6	12.8	20.2	13.0	17.6
C14:1*	0.0	0.0	0.0	0.0	0.0	0.0
C15:0	1.3	3.4	3.1	3.1	2.1	2.6
C16:0*	105.5	239.5	222.2	274.3	183.3	225.1
C16:1*	0.0	0.0	0.8	0.0	0.8	0.0
C18:0*	6.4	16.4	43.1	16.8	9.8	14.0
C18:1 N9*	0.0	3.8	1.9	3.3	1.0	3.5
C18:1 N7	0.0	0.0	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	0.0	0.0	0.0	0.0	0.0
C20:0*	1.8	5.5	13.0	4.7	2.0	2.9
C18:3 N3*	0.0	0.0	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0	0.6	0.0
C20:2 N6*	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.0	0.0	0.0	0.0
C22:0*	0.0	0.8	7.3	0.8	0.0	1.2
C20:4 N7	0.0	0.0	0.8	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0	0.0	0.0
C20:4N6*	1.0	3.4	0.0	2.6	2.0	1.9
C22:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N3	1.5	4.1	1.5	3.5	2.1	2.1
C20:5 N3*	18.2	39.5	3.5	38.4	30.6	42.8
C24:0*	0.0	0.0	6.3	0.0	0.0	0.0
C22:4 N9	0.0	0.0	0.0	0.0	0.0	0.0
C24:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C22:5 N6*	11.9	29.5	8.9	26.9	14.8	18.7
C22:5 N3*	1.1	4.7	0.9	3.6	3.4	2.7
C22:6 N3*	253.5	569.7	107.3	556.5	352.8	451.4
Sum of all FAME's	408.6	934.0	435.4	958.0	620.1	786.4

Table 6: Sample A1 Fatty Acid Profiles as a Percent of Total FAME

	Biomass	Crude Oil	Sterol Esters	TAG	FFA	DAG
Fatty Acid	% FAME	% FAME	% FAME	% FAME	% FAME	% FAME
C12:0*	0.1	0.0	0.4	0.3	0.3	0.0
C14:0*	1.4	1.5	2.9	2.1	2.1	2.2
C14:1*	0.0	0.0	0.0	0.0	0.0	0.0
C15:0	0.3	0.4	0.7	0.3	0.3	0.3
C16:0*	25.8	25.6	51.0	28.6	29.6	28.6
C16:1*	0.0	0.0	0.2	0.0	0.1	0.0
C18:0*	1.6	1.8	9.9	1.8	1.6	1.8
C18:1 N9*	0.0	0.4	0.4	0.3	0.2	0.4
C18:1 N7	0.0	0.0	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	0.0	0.0	0.0	0.0	0.0
C20:0*	0.4	0.6	3.0	0.5	0.3	0.4
C18:3 N3*	0.0	0.0	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0	0.1	0.0
C20:2 N6*	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.0	0.0	0.0	0.0
C22:0*	0.0	0.1	1.7	0.1	0.0	0.1
C20:4 N7	0.0	0.0	0.2	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0	0.0	0.0
C20:4N6*	0.3	0.4	0.0	0.3	0.3	0.2
C22:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N3	0.4	0.4	0.4	0.4	0.3	0.3
C20:5 N3*	4.5	4.2	0.8	4.0	4.9	5.4
C24:0*	0.0	0.0	1.4	0.0	0.0	0.0
C22:4 N9	0.0	0.0	0.0	0.0	0.0	0.0
C24:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C22:5 N6*	2.9	3.2	2.1	2.8	2.4	2.4
C22:5 N3*	0.3	0.5	0.2	0.4	0.5	0.3
C22:6 N3*	62.0	61.0	24.6	58.1	56.9	57.4
Sum of FAME %	100.0	100.0	100.0	100.0	100.0	100.0

[0118] Sample A2 was prepared by dissolving the crude oil in hexane and applying to the head of the column. After fractionation of the sample using flash chromatography, the sterol ester fraction accounted for 0.8% by weight, the triacylglycerol (TAG) fraction accounted for 83.4% by weight, the free fatty acid (FFA) fraction accounted for 1.8% by weight, and the diacylglycerol (DAG) fraction accounted for 5.6% by weight of the crude

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oil. The total fatty acid profiles of the Sample A2 crude oil and isolated fractions are shown below in Table 7 and Table 8 calculated as mg/g and %FAME, respectively.

Table 7: Sample A2 Fatty Acid Profiles Calculated as Milligrams per Gram FAME

	Biomass	Crude Oil	Sterol Esters	TAG	FFA	DAG
Wt. %	NA	NA	0.8%	83.4%	1.8%	5.6%
Fatty Acid	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)
C12:0*	0.6	0.0	0.0	1.5	0.0	1.0
C14:0*	5.7	13.2	8.9	14.1	9.5	5.4
C14:1*	0.0	0.0	0.0	0.0	0.0	0.0
C15:0	1.3	3.3	2.8	3.4	2.1	2.2
C16:0*	105.5	233.7	183.8	246.1	159.7	137.3
C16:1*	0.0	0.0	0.0	0.8	0.0	0.0
C18:0*	6.4	16.6	23.6	16.9	11.3	5.6
C18:1 N9*	0.0	7.6	5.0	4.3	2.4	2.6
C18:1 N7	0.0	0.0	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	2.2	0.7	1.6	0.8	5.1
C20:0*	1.8	5.2	12.1	5.5	2.6	1.1
C18:3 N3*	0.0	0.0	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.8	1.0	0.0
C20:2 N6*	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.0	0.3	0.0	0.0
C22:0*	0.0	0.7	6.0	1.3	0.8	0.0
C20:4 N7	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N6*	1.0	3.0	0.0	3.1	2.3	1.2
C22:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N3	1.5	4.1	1.4	4.3	2.7	1.0
C20:5 N3*	18.2	38.6	2.7	38.6	39.5	45.5
C24:0*	0.0	0.0	4.7	0.6	0.0	0.3
C22:4 N9	0.0	0.0	0.0	0.0	0.0	0.0
C24:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C22:5 N6*	11.9	28.2	8.6	29.6	18.0	14.7
C22:5 N3*	1.1	3.4	0.0	3.5	2.5	2.2
C22:6 N3*	253.5	566.7	102.2	575.0	475.3	447.2
Sum of all FAME's	408.6	926.5	362.3	951.3	730.4	672.5

Table 8: Sample A2 Fatty Acid Profiles as a Percent of Total FAME

	Biomass	Crude Oil	Sterol Esters	TAG	FFA	DAG
Fatty Acid	% FAME	% FAME	% FAME	% FAME	% FAME	% FAME
C12:0*	0.1	0.0	0.0	0.2	0.0	0.2
C14:0*	1.4	1.4	2.4	1.5	1.3	0.8
C14:1*	0.0	0.0	0.0	0.0	0.0	0.0
C15:0	0.3	0.4	0.8	0.4	0.3	0.3
C16:0*	25.8	25.2	50.7	25.9	21.9	20.4
C16:1*	0.0	0.0	0.0	0.1	0.0	0.0
C18:0*	1.6	1.8	6.5	1.8	1.5	0.8
C18:1 N9*	0.0	0.8	1.4	0.5	0.3	0.4
C18:1 N7	0.0	0.0	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	0.2	0.2	0.2	0.1	0.8
C20:0*	0.4	0.6	3.3	0.6	0.4	0.2
C18:3 N3*	0.0	0.0	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.1	0.1	0.0
C20:2 N6*	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.0	0.0	0.0	0.0
C22:0*	0.0	0.1	1.7	0.1	0.1	0.0
C20:4 N7	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N6*	0.3	0.3	0.0	0.3	0.3	0.2
C22:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N3	0.4	0.4	0.4	0.4	0.4	0.2
C20:5 N3*	4.5	4.2	0.7	4.1	5.4	6.8
C24:0*	0.0	0.0	1.3	0.1	0.0	0.0
C22:4 N9	0.0	0.0	0.0	0.0	0.0	0.0
C24:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C22:5 N6*	2.9	3.0	2.4	3.1	2.5	2.2
C22:5 N3*	0.3	0.4	0.0	0.4	0.3	0.3
C22:6 N3*	62.0	61.2	28.2	60.4	65.1	66.5
Sum of FAME %	100.0	100.0	100.0	100.0	100.0	100.0

EXAMPLE 4

- [0119] Triacylglycerides (TAGs) were isolated from a sample of microbial oil previously extracted from the isolated thraustochytrid deposited under ATCC Accession No. PTA-9695 using hexane extraction (sample A1) or the FRIOLEX® process (GEA Westfalia Separator UK Ltd., Milton Keynes, England) (sample A2), as described in Example 3. The relative area percent of each TAG isomer was determined using non-aqueous reversed-phase high performance liquid chromatography (NARP-HPLC) with atmospheric pressure chemical ionization-mass spectrometry (APCI-MS) detection, and a tentative identification of each positional isomer was made using the mass spectra fragmentation patterns.
- [0120] Individual lipid classes, including TAGs, were isolated using flash chromatography. The TAG fraction was analyzed by HPLC/APCI-MS to determine which fatty acid moieties are present in each TAG species, and the relative amounts of each TAG species. Tentative identification of each TAG peak was based on retention time and the APCI spectra of each peak. When using NARP-HPLC, the retention of each TAG increases with the equivalent carbon number (ECN), which is defined as the total number of carbons in all of the acyl chains minus two times the number of double bonds. Also, when using optimal chromatographic conditions, critical pairs of TAG species with the same ECN but with different distributions of saturated and unsaturated fatty acids, as well as fatty acids with varying chain lengths can also be resolved. The APCI mass spectra of each TAG peak provides the masses of the protonated molecular ion $[M + H]^+$, ammonium adduct ions $[M + NH_4]^+$, and DAG fragment ions. Each TAG yields a distinctive mass spectrum, and the mass of the DAG fragment ions help to determine the identity of each TAG species. The fragment ion corresponding to a loss of an acyl group from the *sn*-2 position will be the least intense signal in an APCI spectra because it is energetically less favorable than a loss at the *sn*-1 or *sn*-3 position. Modern Methods for Lipid Analysis by Liquid Chromatography Mass Spectrometry and Related Techniques 276-297 (William Craig Byrdwell ed., 2005).
- [0121] *Flash Chromatography* – Flash chromatography was used to separate the lipid classes present in the crude oil and to determine the weight percent of each class present in the oil. The chromatography system utilized Silica Gel 60 with a mobile phase composed of Petroleum Ether and Ethyl Acetate at 3 mL/min. A step gradient was used

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to selectively elute each lipid class from the column. The mobile phase gradient started from 100% petroleum ether and finished with 50% ethyl acetate (followed by a 100% methanol wash). Fractions were collected in 20 mL test tubes using a Gilson FC 204 large-bed fraction collector (Gilson, Inc., Middleton, WI). Each tube was analyzed by TLC and the tubes containing individual lipid classes (as judged by single spots on TLC plate with expected Rf) were pooled, concentrated to dryness, and weighed. The total fraction content was then determined gravimetrically.

[0122] *TLC Analysis* – Thin layer chromatography was conducted on silica gel plates. The plates were eluted using a solvent system consisting of petroleum ether : ethyl ether : acetic acid (80:20:1) and were visualized using iodine vapor. The Rf values of each spot were then compared with reported literature values for each lipid class.

[0123] *HPLC/APCI-MS Analysis* - The LC/MS system used consisted of a Hewlett Packard model 1100 HPLC equipped with atmospheric pressure chemical ionization (APCI) and a Hewlett Packard model 1100 mass selective detector (MSD) (Agilent Technologies, Inc., Santa Clara, CA). The HPLC method utilized two PHENOMENEX® C18 column (250 mm x 4.6 mm, 5 µm; Phenomenex, Inc. (Torrance, CA)) connected in series, a flow rate of 1 mL/min., an injection volume of 2 µL, and a column temperature of 50°C. The mobile phase consisted of 0.1% ammonium acetate in isopropanol (Solvent A) and acetonitrile (Solvent B). A linear gradient was used starting at 20% Solvent A, increasing to 75% Solvent A in 40 minutes, holding at 75% Solvent A for 5 minutes, returning to 20% Solvent A in 1 minute, and holding at 20% Solvent A for an additional 9 minutes. The MSD mass range was set to m/z 400 – 1150, with a fragmentor voltage of 150, a drying gas flow of 6 L/min, a nebulizer pressure of 45 psig, a drying gas temperature of 350°C, a vaporizer temperature of 325°C, a capillary voltage of 3500 V, and a corona current of 10 µA.

[0124] *Tridocosaehaenoin (Tri-DHA)* – A Tri-DHA STD (NuCheck, Elysian, MN) was used to evaluate the chromatographic system and the accuracy of the detector response. The retention time of the Tri-DHA peak was 22.5 minutes, and the total ion chromatogram (TIC) gave good signal to noise ratio. The APCI mass spectra of the Tri-DHA peak shows the protonated molecular ion $[M + H]^+$ at m/z 1023.7, the ammonium adduct ions $[M + NH_4]^+$ at m/z 1040.8, and a single characteristic DAG fragment ion at m/z 695.5.

[0125] A sample of the isolated TAG fraction was prepared in hexane and analyzed by NARP HPLC/APCI-MS to determine the identities of the individual TAG isomers. .

[0126] The mass spectrum of each peak was evaluated and a tentative identification of each fatty acid moiety was made, as summarized in Tables 9 and 10 below.

Table 9: Tentative Identification of TAG Species by LC/APCI-MS in Sample A1

Retention Time	Peak #	Tentative Identification (<i>sn</i> -1/ <i>sn</i> -2/ <i>sn</i> -3)	Area Percent	[M + H] ⁺	[M + NH4] ⁺	Major (DAG) Fragments
21.4	1	EPA/EPA/DHA	0.3	971.7	988.8	643.5, 669.3
21.9	2	DHA/DHA/EPA	4.4	997.8	1014.7	669.5, 695.5
22.4	3	DHA/DHA/DHA	11.6	1023.7	1040.7	695.5
23.3	4	DHA/ARA/DHA	0.5	999.6	1016.7	671.4
23.6	5	DHA/DPA/DHA	0.2	1025.9	1042.8	697.5
24.1	6	DHA/DHA/ARA	0.7	999.7	1016.8	671.5, 695.5
24.6	7	DHA/DHA/DPA	2.4	1025.7	1042.5	695.5, 697.4
25.3	8	EPA/14:0/DHA	0.3	897.6	914.6	569.4, 595.3
25.9	9	DHA/DHA/14:0	2.6	923.7	940.7	595.4, 695.5
27.2	10	DHA/DHA/15:0	0.4	937.8	954.7	609.5, 695.5
27.5	11	EPA/EPA/16:0	0.2	899.5	916.7	597.5, 643.5
28.0	12	DHA/16:0/EPA	4.7	925.8	942.7	597.4, 623.5, 669.3
28.5	13	DHA/DHA/16:0	30.8	951.7	968.7	623.7, 695.5
29.5	14	DHA/ARA/16:0	0.7	927.6	944.7	599.5, 671.5
29.7	15	DHA/DPA/16:0	0.9	953.7	970.8	625.5, 697.5
30.4	16	DHA/16:0/ARA	0.9	927.7	944.6	599.5, 623.5
30.8	17	DHA/16:0/DPA	4.5	953.8	970.7	623.4, 625.3
31.1	18	DHA/18:0/DHA	1.8	979.7	996.7	651.5
32.3	19	DHA/14:0/16:0	2.3	851.7	868.7	523.5
33.6	20	DHA/15:0/16:0 DHA/20:0/DHA	0.8	865.7 1007.8	882.7 1024.9	537.4 679.5
34.9	21	DHA/16:0/16:0	19.3	879.7	896.7	551.5, 623.5
36.1*	22	DHA/22:0/DHA DHA/18:0/15:0 DPA/16:0/16:0	0.5	1035.8 893.8 881.8	1052.8 910.8 898.8	707.7 565.5 551.5, 625.4
37.4	23	DHA/16:0/18:0	3.7	907.7	924.7	579.5, 623.5
38.9	24	16:0/16:0/14:0	0.3	NA	796.7	523.4, 551.5
40.1	25	DHA Containing TAG	0.4	1117.9	1134.9	789.7
40.8	26	DHA Containing TAG	0.4	1091.9	1108.9	763.7
41.3	27	16:0/16:0/16:0	1.0	NA	824.6	551.5
42.0	28	DHA/16:0/22:0	0.2	963.8	980.8	623.3, 635.4
43.5*	29	DHA/20:0/22:1 16:0/20:0/14:0	0.3	1017.8 835.6	1034.8 852.8	689.7 579.5, 607.5
45.6*	30	DHA/22:0/22:1	0.7	1045.8	1062.8	717.7
46.3*	31	DHA/20:0/22:0	0.5	1019.8	1036.9	691.7

Table 10: Tentative Identification of TAG Species by LC/APCI-MS in Sample A2

Retention Time	Peak #	Tentative Identification (<i>sn-1/sn-2/sn-3</i>)	Area Percent	[M + H] ⁺	[M + NH4] ⁺	(DAG) Fragments
21.4	1	EPA/EPA/DHA	0.3	971.7	988.8	643.5, 669.3
21.9	2	DHA/DHA/EPA	4.5	997.8	1014.7	669.5, 695.5
22.3	3	DHA/DHA/DHA	14.0	1023.7	1040.7	695.5
23.3	4	DHA/ARA/DHA	0.6	999.6	1016.7	671.4
23.6	5	DHA/DPA/DHA	0.3	1025.9	1042.8	697.5
24.1	6	DHA/DHA/ARA	0.9	999.7	1016.8	671.5, 695.5
24.6	7	DHA/DHA/DPA	3.0	1025.7	1042.5	695.5, 697.4
25.4	8	EPA/14:0/DHA	0.2	897.6	914.6	569.4, 595.3
25.9	9	DHA/DHA/14:0	2.1	923.7	940.7	595.4, 695.5
27.2	10	DHA/DHA/15:0	0.5	937.8	954.7	609.5, 695.5
27.6	11	EPA/EPA/16:0	0.2	899.5	916.7	597.5, 643.5
28.1	12	DHA/16:0/EPA	4.2	925.8	942.7	597.4, 623.5, 669.3
28.5	13	DHA/DHA/16:0	31.4	951.7	968.7	623.7, 695.5
29.6	14	DHA/ARA/16:0	0.7	927.6	944.7	599.5, 671.5
29.8	15	DHA/DPA/16:0	0.6	953.7	970.8	625.5, 697.5
30.4	16	DHA/16:0/ARA	0.9	927.7	944.6	599.5, 623.5
30.8	17	DHA/16:0/DPA	4.5	953.8	970.7	623.4, 625.3
31.1	18	DHA/18:0/DHA	2.2	979.7	996.7	651.5
32.4	19	DHA/14:0/16:0	1.5	851.7	868.7	523.5
33.6	20	DHA/15:0/16:0 DHA/20:0/DHA	0.9	865.7 1007.8	882.7 1024.9	537.4 679.5
34.9	21	DHA/16:0/16:0	16.1	879.7	896.7	551.5, 623.5
36.1*	22	DHA/22:0/DHA DHA/18:0/15:0 DPA/16:0/16:0	0.4	1035.8 893.8 881.8	1052.8 910.8 898.8	707.7 565.5 551.5, 625.4
37.3	23	DHA/16:0/18:0	3.4	907.7	924.7	579.5, 623.5
39.7	24	16:0/16:0/14:0	0.9	NA	796.7	523.4, 551.5
40.0	25	DHA Containing TAG	0.8	1117.9	1134.9	789.7
40.8	26	DHA Containing TAG	0.6	1091.9	1108.9	763.7
41.3	27	16:0/16:0/16:0	0.7	NA	824.6	551.5
42.1	28	DHA/16:0/22:0	0.3	963.8	980.8	623.3, 635.4
43.5*	29	DHA/20:0/22:1 16:0/20:0/14:0	0.2	1017.8 835.6	1034.8 852.8	689.7 579.5, 607.5
45.6*	30	DHA/22:0/22:1	0.8	1045.8	1062.8	717.7
46.3*	31	DHA/20:0/22:0	0.7	1019.8	1036.9	691.7

EXAMPLE 5

- [0127] After oil was extracted from the fermentation broth using the Frioalex process, as described in Example 3, the crude oil was further processed via refining, bleaching, and deodorizing steps to obtain a final oil. The final oil was diluted with high oleic sunflower oil to obtain finished commercial oil with a DHA content of approximately 400 mg/g. Individual lipid classes were isolated and the fatty acid profiles of each class was determined using gas chromatography with flame ionization detection (GC-FID) as fatty acid methyl esters (FAME).
- [0128] *Flash Chromatography* – Flash chromatography was used to separate the lipid classes present in the final oil, and to determine the weight percent of each class present in the oil. The chromatography system utilized Silica Gel 60 (EMD Chemical, Gibbstown, NJ) with mobile phase composed of Petroleum Ether and Ethyl Acetate at 3 mL/min. A step gradient was used to selectively elute each lipid class from the column. The mobile phase gradient started from 100% petroleum ether and finished with 50% ethyl acetate (followed by a 100% methanol wash). Fractions were collected in 10 mL test tubes using a Gilson FC 204 large-bed fraction collector (Gilson, Inc., Middleton, WI). Each tube was analyzed by thin layer chromatography (TLC) and the tubes containing individual lipid classes (as judged by single spots on TLC plate with expected retention factor (Rf)) were pooled, concentrated to dryness, and weighed. The total fraction content was then determined gravimetrically.
- [0129] *TLC Analysis* – Thin layer chromatography was conducted on silica gel plates. The plates were eluted using a solvent system consisting of petroleum ether : ethyl ether : acetic acid (80:20:1) and were visualized using iodine vapor. The Rf values of each spot were then compared with reported literature values for each lipid class.
- [0130] *Fatty Acid Analysis* – The final oil sample and isolated lipid classes were analyzed for fatty acid composition as FAMES. Samples were weighed directly into screw cap test tubes, and 1 mL of C19:0 internal standard (NuCheck, Elysian, MN) in toluene and 2 mL of 1.5 N HCl in methanol was added to each tube. The tubes were vortexed briefly and placed in a heating block for 2 hours at 100° C. The tubes were removed from the heating block, allowed to cool, and 1 mL of saturated NaCl in water was added. The tubes were vortexed again, centrifuged, and a portion of the top (organic) layer was placed in a GC vial and analyzed by GC-FID. FAME's were quantified using a 3-point

internal standard calibration curve generated using Nu-Chek-Prep GLC reference standard (Nu-Chek Prep, Inc., Elysian, MN) and tentatively identified based on retention time. Fatty acids present were expressed as mg/g and % of total FAME.

[0131] The sample was prepared by dissolving 250 mg of final oil in 600 μ L of hexane and applying to the head of the column. After fractionation of the sample using flash chromatography, the sterol ester fraction accounted for 1.2% by weight, the triacylglyceride (TAG) fraction accounted for 92.1% by weight, the free fatty acid (FFA) fraction accounted for 2.1% by weight, the sterol fraction accounted for 1.1%, the diacylglyceride (DAG) fraction accounted for 2.8% by weight of the final oil.

[0132] The TLC analysis of the pooled fractions showed that the FFA and sterol fractions were mixed with TAG and DAG respectively. The total fatty acid profiles of the FRIOLEX® final oil and isolated fractions are shown below in Table 11 and Table 12 calculated as mg/g and %FAME, respectively.

Table 11: Fatty Acid Profile Calculated as Milligrams per Gram of FAME

	Final Oil	Sterol Esters	TAG	FFA	Sterol	DAG
Wt. %	NA	1.2	92.1	2.1	1.1	2.8
Fatty Acid	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)
C12:0*	0.0	0.0	1.0	0.0	1.2	0.6
C14:0*	11.5	5.1	11.3	6.0	9.6	5.7
C14:1*	0.0	0.0	0.0	0.0	0.0	0.0
C15:0	2.3	0.0	2.3	1.2	2.0	1.9
C16:0*	183.3	80.0	180.8	99.9	149.3	132.2
C16:1*	0.0	0.0	0.9	0.0	0.8	0.6
C18:0*	19.6	17.5	19.6	7.5	16.2	6.7
C18:1 N9*	243.3	242.8	249.6	62.9	190.5	84.0
C18:1 N7	1.9	1.7	2.0	0.8	1.9	0.9
C18:2 N6*	13.8	5.6	13.8	6.2	14.3	9.1
C20:0*	4.3	6.6	4.5	1.5	3.6	1.4
C18:3 N3*	0.0	0.0	0.3	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.8	0.0	0.8	0.0
C18:4 N3	0.0	0.0	0.7	1.3	0.9	0.4
C20:2 N6*	0.0	0.0	0.6	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.3	0.0	0.0	0.0
C22:0*	3.3	61.0	3.2	1.1	3.0	1.2
C20:4 N7	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0	0.0	0.0
C20:4N6*	1.7	0.0	2.3	1.4	1.9	1.3
C22:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N3	2.4	4.5	3.0	2.2	2.6	1.3
C20:5 N3*	28.1	3.0	27.7	38.6	25.6	43.2
C24:0*	1.4	64.3	1.4	0.0	2.0	1.0
C22:4 N9	0.0	0.0	0.0	0.0	0.0	0.0
C24:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C22:5 N6*	20.0	7.6	21.0	10.1	17.2	14.4
C22:5 N3*	2.8	0.0	3.1	3.7	3.4	2.9
C22:6 N3*	407.1	72.5	417.4	443.6	350.5	428.5
Sum of all FAME's	936.1	572.1	967.6	688.0	797.3	737.3

Table 12: Fatty Acid Profiles as a Percent of Total FAME

	Final Oil	Sterol Esters	TAG	FFA	Sterol	DAG
Fatty Acid	% FAME	% FAME	% FAME	% FAME	% FAME	% FAME
C12:0*	0.0	0.0	0.1	0.0	0.2	0.1
C14:0*	1.2	0.9	1.2	0.9	1.2	0.8
C14:1*	0.0	0.0	0.0	0.0	0.0	0.0
C15:0	0.2	0.0	0.2	0.2	0.2	0.3
C16:0*	19.6	14.0	18.7	14.5	18.7	17.9
C16:1*	0.0	0.0	0.1	0.0	0.1	0.1
C18:0*	2.1	3.1	2.0	1.1	2.0	0.9
C18:1 N9*	26.0	42.4	25.8	9.1	23.9	11.4
C18:1 N7	0.2	0.3	0.2	0.1	0.2	0.1
C18:2 N6*	1.5	1.0	1.4	0.9	1.8	1.2
C20:0*	0.5	1.1	0.5	0.2	0.5	0.2
C18:3 N3*	0.0	0.0	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.1	0.0	0.1	0.0
C18:4 N3	0.0	0.0	0.1	0.2	0.1	0.1
C20:2 N6*	0.0	0.0	0.1	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.0	0.0	0.0	0.0
C22:0*	0.4	10.7	0.3	0.2	0.4	0.2
C20:4 N7	0.0	0.0	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0	0.0	0.0
C20:4N6*	0.2	0.0	0.2	0.2	0.2	0.2
C22:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0	0.0	0.0
C20:4 N3	0.3	0.8	0.3	0.3	0.3	0.2
C20:5 N3*	3.0	0.5	2.9	5.6	3.2	5.9
C24:0*	0.2	11.2	0.1	0.0	0.2	0.1
C22:4 N9	0.0	0.0	0.0	0.0	0.0	0.0
C24:1 N9*	0.0	0.0	0.0	0.0	0.0	0.0
C22:5 N6*	2.1	1.3	2.2	1.5	2.2	1.9
C22:5 N3*	0.3	0.0	0.3	0.5	0.4	0.4
C22:6 N3*	43.6	12.7	43.1	64.5	44.0	58.1
Sum of FAME %	100	100	100	100	100	100

EXAMPLE 6

[0133] An analysis of the triacylglycerides (TAGs) of the final oil described in Example 5 was performed using techniques described in Example 4. The tentative identification of each fatty acid moiety was made, as summarized in Tables 13 and 14 below.

Table 13: Tentative Identification of Major TAG Species

Peak retention Time, min.	Tentative Identification (<i>sn</i> -1/ <i>sn</i> -2/ <i>sn</i> -3)	Area Percent
22.0	DHA/DHA/EPA	3.4
22.5	DHA DHA/DHA	10.4
24.7	DHA/DHA/DPA	2.1
28.2	DHA/16:0/EPA	3.4
28.7	DHA/16:0/DHA	23.0
31.0	DHA/16:0/DPA	3.3
35.2	DHA/16:0/16:0	11.6
37.6	DHA/16:0/18:0	4.3
40.4	18:1/18:1/18:1	14.0

Table 14: Tentative Identification of TAG Species by LC/APCI-MS

Retention Time	Peak #	Tentative Identification (sn-1/sn-2/sn-3)	Area Percent	[M + H] +	[M + NH4] ⁺	(DAG) Fragments
21.5	1	EPA/EPA/DHA	0.4	971.7	988.7	643.5, 669.5
22.0	2	DHA/DHA/EPA	3.4	997.8	1014.7	669.4, 695.5
22.5	3	DHA/DHA/DHA	10.4	1023.8	1040.7	695.5
23.4	4	DHA/DHA/ARA	0.5	999.8	1016.7	671.4, 695.3
23.7	5	DHA/DPA/DHA	0.3	1025.7	1042.7	697.5
24.2	6	DHA/DHA/ARA	0.8	999.7	1016.8	671.5, 695.5
24.7	7	DHA/DHA/DPA	2.1	1025.7	1042.5	695.5, 697.4
25.6	8	EPA/14:0/DHA	0.2	897.7	914.8	569.4, 595.3
26.1	9	DHA/14:0/DHA	1.4	923.7	940.7	595.5, 695.5
27.4	10	DHA/15:0/DHA	0.3	937.8	954.8	609.3
27.7	11	EPA/16:0/EPA	0.2	899.5	916.7	597.5
28.2	12	DHA/16:0/EPA	3.4	925.7	942.7	597.5, 623.4, 669.3
28.7	13	DHA/16:0/DHA	23.0	951.7	968.7	623.5, 695.5
29.8	14	DHA/16:0/ARA	0.5	927.7	944.8	599.5, 623.5
30.0	15	DHA/16:0/DPA	0.7	953.8	970.8	623.4, 625.5
30.6	16	DHA/16:0/ARA	0.8	927.7	944.8	599.5, 623.5
31.0	17	DHA/16:0/DPA	3.3	953.7	970.7	623.4, 625.5
31.3	18	DHA/18:0/DHA	1.6	979.8	996.8	651.5
32.6	19	DHA/14:0/16:0	1.6	851.8	868.8	523.5
33.9	20	DHA/15:0/16:0 DHA/20:0/DHA	0.8	865.7 1007.8	882.7 1024.8	537.4 679.5
35.2	21	DHA/16:0/16:0	11.6	879.7	896.8	551.5, 623.5
36.4	22	DHA/22:0/DHA DHA/18:0/15:0 DPA/16:0/16:0	0.5	1035.8 893.8 881.8	1052.8 910.8 898.8	707.7 565.5 551.5, 625.4
37.6	23	DHA/16:0/18:0	4.3	907.8	924.8	579.5, 623.5
40.0	24	DHA/16:0/20:0	0.8	935.8	952.8	607.6, 623.5
40.4	25	18:1/18:1/18:1	14.0	885.8	902.8	603.5
40.7	26	18:1/16:0/18:1	2.2	859.8	876.8	577.5
41.1	27	DHA Containing TAG	1.6	1092.0	1108.8	763.7
42.4	28	24:0 Containing TAG	0.5	963.8	980.9	594.5
43.0	29	18:1/18:1/18:0	1.9	887.7	904.8	603.6, 605.6
45.9	30	DHA/22:0/22:1	0.9	1045.9	1062.9	717.6
46.6	31	DHA/20:0/22:0	0.7	1019.8	1036.8	691.5

EXAMPLE 7

- [0134] A two-day old inoculum flask of the isolated thraustochytrid deposited under ATCC Accession No. PTA-9695 was prepared in a carbon and nitrogen-fed culture with 980 ppm Cl^- (thraustochytrid media).
- [0135] Mutagenesis was carried out according to following procedure:
- [0136] A sterile T=2 day old flask, approximately 50 ml, was poured into a sterile 40 ml glass homogenizer. The culture received 50 plunges in the homogenizer. The culture was pipetted out and filtered through a sterile 50 micron mesh filter, which was placed in a 50 ml sterile tube (the mesh was used as a means of retaining the larger clumps of colonies while letting the smaller clusters and single cells pass through the 50 micron mesh.). The entire concentrated macerate was collected in a sterile 50 ml tube. The macerated culture was vortexed and dilutions at levels up to 1:100 fold were made in tubes containing thraustochytrid media. The diluted macerate samples were vortexed prior to adding 200 μl of inoculum to a thraustochytrid media agar petri dish, 100 x 15 mm, containing 4-5 glass beads (3 mm glass beads). Each plate was gently agitated in an effort to have the beads spread the inoculum evenly around the plate. Beads were dumped off of plates and plates were left to sit with covers on for approximately 5 minutes to dry. Lights in both the sterile hood and adjoining areas were turned off as the procedure was performed in dim light. There was minimal light available to be able to run the procedure but only indirect and dim.
- [0137] Five replicate plates were placed on the floor of the XL crosslinker (Spectronics Corporation, New York) with the lids off while the samples were irradiated. The crosslinker delivered power in terms of microjoules and a level was sought that achieved a 90%-95% Kill. Five replicate control plates were inoculated with un-mutagenized cells using the same protocol. These cell counts were used to calculate the % Kill. Once the irradiation was finished the plates were taken out, the lids were replaced, and the plates were wrapped in parafilm followed by a wrap in aluminum foil. It was imperative that the plates grew for the first week in the dark so that they were not able to repair the damaged genes.
- [0138] Plates were placed in a 22.5°C room for about 10 days prior to counting the colonies. When final counts were made, individual colonies were picked with a sterile inoculating loop and re-streaked on new thraustochytrid media plates. Each colony was

plated on an individual plate. As plates grew dense a sample was taken, using a inoculating loop, and inoculated into a sterile 250 ml shake flask containing 50 ml of thraustochytrid media. This flask was placed on a shaker at 200 rpm in a 22.5°C room. On T=7 days the shake flask culture was harvested into a 50 ml sterile tube. The pH was taken and the sample was spun down to collect the biomass pellet. Each sample was rinsed and re-suspended in a 50:50 mixture of isopropyl alcohol and distilled water prior to being re-spun. The collected pellet was freeze dried, weighed, and a FAME analysis was performed. The data in Tables 15-21 represents mutants produced with the above process.

Table 15: Mutants of Thraustochytrid Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA-9695	Mutant 1	Mutant 2	Mutant 3	Mutant 4	Mutant 5	Mutant 8	Mutant 9	Mutant 10
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.10	0.10	0.08	0.08	0.13	0.07	0.11	0.08	0.08
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.11	0.11	0.17	0.13	0.12	0.18	0.11	0.15	0.14
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 14:0	1.79	1.85	1.49	1.37	2.36	1.29	1.85	1.72	1.57
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 15:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:0	30.98	28.75	29.96	29.97	30.33	29.86	30.97	30.11	29.20
% 16:1	0.27	0.20	0.31	0.14	0.25	0.27	0.16	0.27	0.24
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.12	0.15	0.13	0.17	0.27	0.12	0.16	0.13	0.13
% 18:0	1.29	1.22	1.38	1.47	1.22	1.57	1.25	1.34	1.34
% 18:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.03	0.00	0.00	0.07	0.00	0.03	0.00	0.00
% 18:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.39	0.36	0.42	0.45	0.34	0.46	0.37	0.40	0.40
% 20:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.37	0.38	0.32	0.42	0.44	0.32	0.41	0.33	0.36
% 20:4 ARA	0.55	0.55	0.94	0.57	0.80	0.89	0.60	0.73	0.75

Table 15 continued

Fatty Acids	control ATCC PTA-9695	Mutant 1	Mutant 2	Mutant 3	Mutant 4	Mutant 5	Mutant 8	Mutant 9	Mutant 10
% 20:5 n-3 EPA	2.62	2.94	3.01	2.40	3.64	2.83	2.54	2.81	2.81
% 22:0	0.08	0.08	0.09	0.09	0.07	0.10	0.07	0.09	0.09
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:5 n-6	3.19	3.19	2.94	3.43	3.35	2.87	3.34	3.01	3.15
% 22:5 n-3	0.18	0.18	0.21	0.23	0.20	0.18	0.20	0.17	0.18
% 22:6 n-3 DHA	56.88	58.63	57.56	57.85	54.87	57.98	56.62	57.53	58.52
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.09	0.00
% Fat	46.83	46.10	31.23	47.39	49.78	30.62	54.71	37.72	37.87
% Unknown	0.85	0.46	0.35	0.51	0.51	0.36	0.50	0.38	0.39

Table 16: Mutants of Thraustochytrid Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA-9695	Mutant 11	Mutant 13	Mutant 14	Mutant 15	Mutant 16	Mutant 20	Mutant 21	Mutant 22
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.10	0.10	0.08	0.09	0.11	0.11	0.09	0.09	0.10
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.11	0.15	0.16	0.14	0.13	0.12	0.17	0.16	0.13
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 14:0	1.79	1.89	1.43	1.75	1.83	1.98	1.76	1.77	1.81
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 15:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:0	30.98	31.08	30.27	29.92	31.79	30.18	28.84	30.05	30.81
% 16:1	0.27	0.32	0.26	0.28	0.21	0.24	0.23	0.23	0.33
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.12	0.24	0.15	0.13	0.15	0.12	0.14	0.16	0.14
% 18:0	1.29	1.36	1.44	1.31	1.36	1.21	1.28	1.34	1.33
% 18:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.05	0.00	0.00	0.00	0.03	0.00	0.00	0.00
% 18:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.39	0.38	0.42	0.39	0.40	0.37	0.37	0.38	0.38
% 20:1 n-9	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.37	0.43	0.36	0.33	0.36	0.37	0.33	0.35	0.34
% 20:4 ARA	0.55	0.79	0.72	0.80	0.64	0.62	0.83	0.73	0.69
% 20:5 n-3 EPA	2.62	3.17	2.72	2.97	2.52	2.66	3.03	2.90	2.87
% 22:0	0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08

Table 16 continued

Fatty Acids	control ATCC PTA-9695	Mutant 11	Mutant 13	Mutant 14	Mutant 15	Mutant 16	Mutant 20	Mutant 21	Mutant 22
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:5 n-6	3.19	3.25	3.06	2.97	3.07	3.16	2.98	3.01	3.02
% 22:5 n-3	0.18	0.20	0.19	0.17	0.19	0.16	0.17	0.18	0.18
% 22:6 n-3 DHA	56.88	55.17	57.52	57.63	56.02	57.38	58.58	57.45	56.65
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.08
% Fat	46.83	46.19	37.00	38.41	48.46	47.32	37.71	40.23	43.55
% Unknown	0.85	0.47	0.39	0.36	0.47	0.44	0.37	0.39	0.38

Table 17: Mutants of Thraustochytrid Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA-9695	Mutant 24	Mutant 26	Mutant 27	Mutant 29	Mutant 30	Mutant 33	Mutant 34	Mutant 35
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.10	0.11	0.09	0.09	0.08	0.08	0.10	0.11	0.09
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.11	0.12	0.13	0.14	0.16	0.14	0.12	0.12	0.10
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 14:0	1.79	1.98	1.71	1.69	1.63	1.66	1.93	2.01	1.59
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 15:1	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.54	0.39
% 16:0	30.98	30.61	30.32	30.21	29.70	29.50	30.26	32.28	30.78
% 16:1	0.27	0.19	0.22	0.22	0.26	0.26	0.29	0.26	0.16
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.12	0.15	0.18	0.16	0.13	0.13	0.26	0.16	0.12
% 18:0	1.29	1.24	1.31	1.31	1.32	1.30	1.32	1.37	1.34
% 18:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.11	0.09
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.39	0.37	0.39	0.40	0.40	0.39	0.37	0.40	0.40
% 20:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.14
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.37	0.38	0.37	0.35	0.35	0.35	0.00	0.00	0.00
% 20:4 ARA	0.55	0.61	0.59	0.69	0.68	0.32	0.34	0.24	0.28
% 20:5 n-3 EPA	2.62	2.62	2.70	2.85	2.90	2.91	3.28	2.51	2.59
% 22:0	0.08	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08

Table 17 continued

Fatty Acids	control ATCC PTA-9695	Mutant 24	Mutant 26	Mutant 27	Mutant 29	Mutant 30	Mutant 33	Mutant 34	Mutant 35
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:5 n-6	3.19	3.10	3.11	3.05	3.10	3.11	3.43	3.26	3.56
% 22:5 n-3	0.18	0.16	0.18	0.19	0.18	0.18	0.18	0.15	0.24
% 22:6 n-3 DHA	56.88	57.03	57.46	57.46	57.96	58.52	55.92	54.96	56.73
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.08	0.00	0.00	0.00	0.00	0.07	0.07	0.07
% Fat	46.83	47.80	43.50	38.86	38.60	38.16	46.95	46.43	51.55
% Unknown	0.85	0.45	0.42	0.39	0.37	0.82	1.25	1.23	1.25

Table 18: Mutants of Thraustochytrid Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA-9695	Mutant 36	Mutant 37	Mutant 38	Mutant 39	Mutant 40	Mutant 42	Mutant 43	Mutant 44
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.10	0.00	0.11	0.00	0.11	0.09	0.08	0.12	0.09
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.11	0.44	0.09	0.24	0.12	0.11	0.12	0.08	0.15
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 14:0	1.79	1.25	1.99	1.48	1.96	1.76	1.43	2.17	1.75
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 15:1	0.00	2.12	0.48	0.71	0.54	0.55	0.36	0.62	0.50
% 16:0	30.98	26.95	28.04	32.28	30.84	30.25	25.77	43.37	30.18
% 16:1	0.27	0.00	0.26	0.23	0.22	0.21	0.10	1.05	0.22
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.12	0.95	0.13	0.28	0.16	0.16	0.10	0.26	0.13
% 18:0	1.29	1.58	1.11	1.79	1.30	1.29	1.25	2.21	1.34
% 18:1 n-9	0.00	0.37	0.08	0.25	0.09	0.09	0.12	0.09	0.10
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.39	0.34	0.31	0.43	0.38	0.39	0.36	0.61	0.40
% 20:1 n-9	0.00	0.00	0.00	0.43	0.00	0.14	0.15	0.15	0.49
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:4 ARA	0.55	0.41	0.31	0.24	0.27	0.24	0.30	0.35	0.23
% 20:5 n-3 EPA	2.62	5.36	2.77	4.00	2.72	2.80	3.21	3.47	2.80
% 22:0	0.08	0.00	0.07	0.14	0.07	0.08	0.07	0.14	0.08

Table 18 continued

Fatty Acids	control ATCC PTA-9695	Mutant 36	Mutant 37	Mutant 38	Mutant 39	Mutant 40	Mutant 42	Mutant 43	Mutant 44
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
% 22:5 n-6	3.19	2.40	3.94	2.57	3.48	3.29	3.89	2.37	3.33
% 22:5 n-3	0.18	0.00	0.19	0.00	0.17	0.17	0.30	0.33	0.17
% 22:6 n-3 DHA	56.88	57.52	58.57	54.20	56.24	57.09	60.99	41.61	56.76
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.00	0.08	0.00	0.08	0.09	0.08	0.06	0.09
% Fat	46.83	12.73	54.86	18.08	45.74	42.59	42.48	56.44	41.20
% Unknown	0.85	0.29	1.36	0.73	1.28	1.20	1.31	0.90	1.20

Table 19: Mutants of *Thraustochytrid* Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA- 9695	Mutant 45	Mutant 46	Mutant 47	Mutant 48	Mutant 49	Mutant 50	Mutant 51	Mutant 52
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.10	0.10	0.13	0.11	0.07	0.09	0.09	0.09	0.11
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.11	0.11	0.10	0.09	0.13	0.09	0.13	0.10	0.09
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 14:0	1.79	1.79	2.07	1.86	1.52	1.62	1.78	1.78	1.85
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 15:1	0.00	0.41	0.76	0.57	0.46	0.48	0.55	0.53	0.53
% 16:0	30.98	28.79	24.90	30.07	29.07	31.21	30.46	30.79	32.53
% 16:1	0.27	0.19	0.24	0.18	0.17	0.17	0.18	0.21	0.22
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.12	0.11	0.24	0.16	0.12	0.14	0.17	0.18	0.15
% 18:0	1.29	1.24	1.07	1.28	1.41	1.43	1.36	1.48	1.35
% 18:1 n-9	0.00	0.08	0.07	0.09	0.09	0.08	0.10	0.09	0.06
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.00	0.12	0.05	0.00	0.00	0.00	0.00	0.00
% 18:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.39	0.36	0.29	0.37	0.42	0.42	0.39	0.40	0.41
% 20:1 n-9	0.00	0.15	0.13	0.11	0.24	0.13	0.19	0.16	0.19
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.37	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
% 20:4 ARA	0.55	0.29	0.65	0.26	0.18	0.21	0.22	0.24	0.24
% 20:5 n-3 EPA	2.62	3.05	4.28	2.66	2.93	2.46	2.71	2.94	2.44

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Table 19 continued

Fatty Acids	control ATCC PTA- 9695	Mutant 45	Mutant 46	Mutant 47	Mutant 48	Mutant 49	Mutant 50	Mutant 51	Mutant 52
% 22:0	0.08	0.07	0.06	0.07	0.09	0.09	0.08	0.08	0.08
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.06	0.07	0.05	0.00	0.00	0.00	0.00	0.00
% 22:5 n-6	3.19	3.59	4.28	3.46	3.07	3.32	3.17	3.18	3.24
% 22:5 n-3	0.18	0.25	0.27	0.18	0.17	0.17	0.16	0.17	0.17
% 22:6 n-3 DHA	56.88	57.74	58.32	56.70	58.65	56.45	56.83	56.19	55.06
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.07	0.15	0.10	0.10	0.11	0.10	0.10	0.07
% Fat	46.83	48.91	58.95	54.80	35.41	48.60	44.93	43.01	51.93
% Unknown	0.85	1.55	1.63	1.57	1.09	1.35	1.31	1.28	1.19

Table 20: Mutants of Thraustochytrid Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA-9695	Mutant 53	Mutant 54	Mutant 55	Mutant 56	Mutant 57	Mutant 58	Mutant 60	Mutant 61	Mutant 65
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.10	0.09	0.08	0.12	0.08	0.08	0.08	0.08	0.10	0.08
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.11	0.11	0.12	0.08	0.09	0.13	0.16	0.14	0.09	0.14
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 14:0	1.79	1.74	1.63	2.13	1.67	1.59	1.59	1.59	1.85	1.58
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 15:1	0.00	0.53	0.52	0.48	0.51	0.52	0.45	0.50	0.51	0.48
% 16:0	30.98	30.13	29.54	33.01	31.08	29.37	30.65	29.39	31.15	30.03
% 16:1	0.27	0.21	0.23	0.26	0.26	0.14	0.25	0.22	0.26	0.25
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.12	0.15	0.14	0.14	0.14	0.16	0.12	0.13	0.14	0.13
% 18:0	1.29	1.30	1.30	1.37	1.38	1.37	1.46	1.30	1.30	1.35
% 18:1 n-9	0.00	0.08	0.08	0.00	0.06	0.11	0.09	0.10	0.07	0.07
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.39	0.38	0.39	0.40	0.42	0.38	0.43	0.39	0.39	0.41
% 20:1 n-9	0.00	0.19	0.16	0.13	0.19	0.20	0.17	0.14	0.13	0.21
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:4 ARA	0.55	0.25	0.21	0.26	0.22	0.25	0.51	0.20	0.24	0.19
% 20:5 n-3 EPA	2.62	2.75	2.78	2.81	2.67	2.78	5.76	2.72	2.59	2.82
% 22:0	0.08	0.08	0.08	0.08	0.09	0.08	0.09	0.08	0.08	0.09

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Table 20 continued

Fatty Acids	control ATCC PTA-9695	Mutant 53	Mutant 54	Mutant 55	Mutant 56	Mutant 57	Mutant 58	Mutant 60	Mutant 61	Mutant 65
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00
% 22:5 n-6	3.19	3.47	3.20	3.25	3.19	3.43	2.62	3.30	3.42	3.18
% 22:5 n-3	0.18	0.18	0.18	0.17	0.17	0.20	0.59	0.17	0.17	0.17
% 22:6 n-3 DHA	56.88	56.99	58.07	54.04	56.38	57.76	54.09	58.21	55.91	57.56
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.09	0.09	0.07	0.10	0.09	0.11	0.10	0.07	0.08
% Fat	46.83	45.83	39.59	48.81	41.92	43.97	33.96	36.97	50.40	36.21
% Unknown	0.85	1.28	1.19	1.19	1.29	1.35	0.77	1.24	1.48	1.17

Table 21: Mutants of Thraustochytrid Strain ATCC Accession No. PTA-9695

Fatty Acids	control ATCC PTA- 9695	Mutant 66	Mutant 67	Mutant 68 ATCC PTA- 9696	Mutant 69	Mutant 70 ATCC PTA- 9697	Mutant 71	Mutant 72 ATCC PTA- 9698	Mutant 73	Mutant 74
% 08:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 09:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 10:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 11:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 12:0	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
% 12:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 13:1	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00
% 14:0	2.42	2.29	2.07	2.09	2.11	2.21	2.27	2.29	1.97	2.05
% 14:1	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00
% 15:1	0.55	0.47	0.48	0.47	0.47	0.44	0.46	0.40	0.50	0.47
% 16:0	39.19	31.02	26.20	25.84	27.79	28.14	28.89	33.49	24.50	23.95
% 16:1	0.43	0.19	0.00	0.00	0.00	0.00	0.19	0.21	0.00	0.00
% 16:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 16:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 17:0	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
% 18:0	1.67	1.68	1.22	1.22	1.44	1.49	1.51	2.24	1.11	1.02
% 18:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:1 n-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 18:3 n-3	0.00	0.18	0.20	0.21	0.19	0.17	0.22	0.16	0.22	0.22
% 18:4 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:0	0.49	0.41	0.32	0.31	0.35	0.37	0.44	0.52	0.29	0.27
% 20:1 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 21 continued

Fatty Acids	control ATCC PTA- 9695	Mutant 66	Mutant 67	Mutant 68 ATCC PTA- 9696	Mutant 69	Mutant 70 ATCC PTA- 9697	Mutant 71	Mutant 72 ATCC PTA- 9698	Mutant 73	Mutant 74
% 20:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:3 n-6	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00
% 20:3 n-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 20:4 ARA	0.18	0.16	0.33	0.27	0.24	0.37	0.30	0.27	0.38	0.39
% 20:5 n-3 EPA	1.76	2.30	3.86	3.97	3.32	4.12	3.09	2.74	4.43	4.53
% 22:0	0.33	0.46	0.35	0.44	0.48	0.38	0.43	0.12	0.35	0.34
% 22:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:4 n-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 22:5 n-6	2.62	2.83	3.17	2.66	2.72	2.95	3.46	2.79	3.17	3.19
% 22:5 n-3	0.18	0.18	0.46	0.42	0.34	0.61	0.25	0.27	0.48	0.57
% 22:6 n-3 DHA	49.52	57.01	60.60	61.42	59.74	58.03	55.62	53.06	61.83	62.23
% 24:0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% 24:1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Fat	52.70	49.32	48.51	49.49	48.80	53.65	40.38	63.40	48.27	46.63
% Unknown	0.35	0.82	0.73	0.66	0.67	0.73	2.46	1.18	0.78	0.76

EXAMPLE 8

[0139] Four thraustochytrid samples were obtained from the American Tissue and Culture Collection (ATCC) and each sample was analyzed for the fatty acid profile of the biomass, the fatty acid profile of the extracted crude oil, the triacylglyceride (TAG) fraction of the crude oil, and the polar lipid (PL) fraction of the crude oil. The samples analyzed were ATCC 34304, 20890, 20889, and 20892. The strains were inoculated into 250 ml shake flask containing 50 mls of the following medium: 1 g peptone, 1 g yeast extract, 5 g glucose in 1 liter of artificial seawater. Cultures were incubated at 20 °C with shaking at 200 rpm on an orbital shaker. After 7 days the cultures was harvested by centrifugation (5087 xg), washed with a mixture of water: isopropanol (1:1), and centrifuged again. The resulting pellet was freeze dried. The crude oil was extracted from the dried biomass using the method of Bligh and Dyer (*Can. J. of Biol. And Phys.* 37: 911-917 (1959)). TAGs and PLs were isolated from the crude oil using a variation of the solid phase extracted (SPE) method developed by Kaluzny *et al.* (*J. Lipid Res.* 26: 135-140 (1959)). The crude oil and isolated fractions were analyzed for DHA and EPA content as well as the total fatty acid content (as fatty acid methyl esters).

[0140] *Lipid Extraction* – Crude oil was extracted from the freeze dried biomass by weighing 100 to 200 mg into a 1.5 x 10 cm screw top test tube, adding 8 mL of a monophasic system consisting of 1:2:0.8 chloroform : methanol : water (CHCl₃:MeOH:H₂O), and homogenizing with a POLYTRON® PT 3100 dispersing unit equipped with a PT-DA 3012/2 aggregate. The sample was homogenized for 2 minutes at 10000 rpm while immersed in an ice bath. A biphasic system was produced by adding 2.1 mL of CHCl₃, vortexing for 1 minute, adding 1.7 mL of H₂O, and vortexing again for an additional 1 minute. The bottom (organic) layer was removed using a Pasteur pipet and placed into a collection flask. The MeOH-H₂O layer left in the test tube was re-extracted two more times with 2.1 mL portions of CHCl₃. The organic layers were combined and dried under a stream of nitrogen.

[0141] *Solid Phase Extraction* - The TAG and PL fractions were separated from the crude lipid by SPE using 500 mg aminopropyl cartridges (Burdick & Jackson) placed in a Vac Elut apparatus. The cartridge was condition with 5 mL of hexane, and 10 to 20 mg of each sample was dissolved in 400 µL CHCl₃ and applied to the cartridge. The column

was washed with 4 mL of 2:1 CHCl₃:isopropyl alcohol (IPA) to elute all the neutral lipids, which were collected and dried under nitrogen. The fatty acids were then eluted with 5 mL of 2% acetic acid (HOAc) in ether, which was discarded. The PL portion was eluted with 5 mL of MeOH, which was collected and dried under nitrogen. The neutral lipid fraction was re-dissolved in 400 µL of hexane and applied to a second aminopropyl column (previously conditioned with 5 mL of hexane). Sterol esters were eluted with 5 mL of 1% ethyl acetate (EtOAc) in hexane and discarded. Finally, TAGs were eluted with 5 mL of 3% EtOAc in hexane, which was collected and dried under nitrogen.

[0142] *TLC Analysis* – Thin layer chromatography was conducted on silica gel plates. The plates were eluted using a solvent system consisting of petroleum ether : ethyl ether : acetic acid (80:20:1) and were visualized using iodine vapor.

[0143] *Fatty Acid Analysis* – Samples of biomass, crude oil, isolated TAG, and PL fractions were analyzed for fatty acid composition as FAMES. Samples were weighed directly into screw cap test tubes, and 1 mL of C19:0 internal standard in toluene and 2 mL of 1.5 N HCl in methanol was added to each tube. The tubes were vortexed briefly and placed in a heating block for 2 hours at 100°C. The tubes were removed from the heating block, allowed to cool, and 1 mL of saturated NaCl in water was added. The tubes were vortexed again, centrifuged, and a portion of the top (organic) layer was placed in a GC vial and analyzed by GC-FID. FAME's were quantified using a 3-point internal standard calibration curve generated using Nu-Chek-Prep GLC reference standard and tentatively identified based on retention time. Fatty acids present were expressed as mg/g and % of total FAME.

[0144] *ATCC 34304* – The lipid content of the ATCC 34304 biomass was estimated to be 9.1% as the sum of FAME, and the amount of crude oil obtained after solvent extraction was 9.2% by weight, giving a 101% recovery of fat present in the biomass. The EPA and DHA content of the biomass was determined to be 4.8 mg/g and 38.7 mg/g, respectively. The extracted crude oil contained 25.9 mg/g EPA and 238.7 mg/g DHA. The isolated TAG contained 13.9 mg/g EPA and 303.9 mg/g DHA, while the isolated PL contained 38.7 mg/g EPA and 237.980 mg/g DHA. The total fatty acid profiles of the biomass, extracted crude oil, TAG fraction, and PL fraction are shown below in Table 22 and Table 23 calculated as mg/g and % FAME, respectively.

Table 22: Fatty Acid Profile of ATCC 34304 Calculated as Milligrams per Gram

Fatty Acid	Biomass FAME (mg/g)	Crude Oil FAME (mg/g)	TAG FAME (mg/g)	PL FAME (mg/g)
C12:0*	0.0	0.0	0.0	0.0
C14:0*	1.5	8.5	13.7	1.5
C14:1*	0.0	0.2	0.0	0.0
C15:0	0.0	0.0	0.0	0.0
C16:0*	20.8	138.9	250.8	73.9
C16:1*	0.2	2.9	6.9	0.3
C18:0*	2.1	17.8	45.6	0.8
C18:1 N9*	3.8	29.8	74.2	4.2
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	1.5	12.0	31.0	2.5
C20:0*	0.1	0.7	1.7	0.1
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.1	0.3	0.0
C18:4 N3	0.0	8.5	0.3	0.0
C20:2 N6*	0.1	0.8	2.2	0.0
C20:3 N6	0.0	2.5	6.3	0.5
C22:0*	0.3	5.2	0.3	0.0
C20:4 N7	0.4	2.7	0.0	0.0
C20:3 N3	0.0	0.0	0.6	0.0
C20:4N6*	3.4	20.8	20.9	27.5
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0
C20:4 N3	0.1	0.6	1.3	0.3
C20:5 N3*	4.8	25.9	13.9	38.7
C24:0*	0.4	0.2	0.3	0.0
C22:4 N9	0.0	1.2	0.7	0.4
C24:1 N9*	0.9	6.9	18.2	0.8
C22:5 N6*	11.0	60.8	51.9	45.9
C22:5 N3*	0.4	3.1	6.8	1.0
C22:6 N3*	38.7	238.7	303.9	237.9
Sum of all FAME	91.2	590.9	855.7	437.3

Table 23: Fatty Acid Profiles of ATCC 34304 Calculated as a Percent of Total FAME

Fatty Acid	Biomass % FAME	Crude Oil % FAME	TAG % FAME	PL % FAME
C12:0*	0.0	0.0	0.0	0.0
C14:0*	1.7	1.5	1.6	0.4
C14:1*	0.0	0.0	0.0	0.0
C15:0	0.0	0.0	0.0	0.0
C16:0*	22.8	24.2	29.3	16.9
C16:1*	0.2	0.5	0.8	0.1
C18:0*	2.3	3.1	5.3	0.2
C18:1 N9*	4.2	5.2	8.7	1.0
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	1.6	2.1	3.6	0.6
C20:0*	0.1	0.1	0.2	0.0
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0
C20:2 N6*	0.1	0.1	0.3	0.0
C20:3 N6	0.0	0.4	0.7	0.1
C22:0*	0.3	0.9	0.0	0.0
C20:4 N7	0.5	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.1	0.0
C20:4N6*	3.7	3.4	2.4	6.3
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0
C20:4 N3	0.1	0.1	0.2	0.1
C20:5 N3*	5.3	4.5	1.6	8.8
C24:0*	0.5	0.0	0.0	0.0
C22:4 N9	0.0	0.0	0.1	0.1
C24:1 N9*	1.0	1.2	2.1	0.2
C22:5 N6*	12.1	10.5	6.1	10.5
C22:5 N3*	0.5	0.5	0.8	0.2
C22:6 N3*	42.5	41.5	35.5	54.4
Sum of FAME %	100.0	100.0	100.0	100.0

[0145] *ATCC 20890* – The lipid content of the *ATCC 20890* biomass was estimated to be 9.2% as the sum of FAME, and the amount of crude oil obtained after solvent extraction was 10.2% by weight, giving a 111% recovery of fat present in the biomass. The EPA and DHA content of the biomass was determined to be 12.2 mg/g and 36.6 mg/g, respectively. The extracted crude oil contained 64.7 mg/g EPA and 194.2 mg/g DHA. The isolated TAG contained 41.9 mg/g EPA and 230.2 mg/g DHA, while the isolated PL

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contained 54.4 mg/g EPA and 149.5 mg/g DHA. The total fatty acid profiles of the biomass, extracted crude oil, TAG fraction, and PL fraction are shown below in Table 24 and Table 25 calculated as mg/g and % FAME, respectively.

Table 24: Fatty Acid Profile of ATCC 20890 Calculated as Milligrams per Gram

Fatty Acid	Biomass FAME (mg/g)	Crude Oil FAME (mg/g)	TAG FAME (mg/g)	PL FAME (mg/g)
C12:0*	0.0	0.0	0.0	0.0
C14:0*	0.6	5.2	22.6	3.2
C14:1*	0.0	0.0	0.0	0.2
C15:0	0.0	0.0	0.0	0.0
C16:0*	25.4	161.1	206.1	142.5
C16:1*	0.2	1.3	4.7	0.8
C18:0*	1.8	12.1	58.9	7.1
C18:1 N9*	1.0	9.7	37.6	2.4
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	0.8	4.8	6.9	3.9
C20:0*	0.1	0.0	0.0	0.3
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0
C20:2 N6*	1.9	11.1	14.2	13.1
C20:3 N6	1.0	5.4	2.4	8.0
C22:0*	0.0	0.0	0.0	0.0
C20:4 N7	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0
C20:4N6*	5.3	33.6	35.8	35.3
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.2	0.0	0.0	1.1
C20:4 N3	0.1	2.2	0.0	3.1
C20:5 N3*	12.2	64.7	41.9	54.4
C24:0*	0.3	0.0	0.0	0.2
C22:4 N9	0.0	0.0	0.0	0.0
C24:1 N9*	0.3	1.4	1.6	1.9
C22:5 N6*	0.5	2.4	1.4	3.0
C22:5 N3*	3.6	19.4	23.9	19.8
C22:6 N3*	36.6	194.2	230.2	149.5
Sum of all FAME	92.3	535.1	735.0	450.9

Table 25: Fatty Acid Profiles of ATCC 20890 Calculated as a Percent of Total FAME

	Biomass	Crude Oil	TAG	PL
Fatty Acid	% FAME	% FAME	% FAME	% FAME
C12:0*	0.0	0.0	0.0	0.0
C14:0*	0.7	1.0	3.1	0.7
C14:1*	0.0	0.0	0.0	0.0
C15:0	0.0	0.0	0.0	0.0
C16:0*	27.6	30.1	28.0	31.6
C16:1*	0.2	0.3	0.6	0.2
C18:0*	2.0	2.3	8.0	1.6
C18:1 N9*	1.1	1.8	5.1	0.5
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	0.9	0.9	0.9	0.9
C20:0*	0.1	0.0	0.0	0.1
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0
C20:2 N6*	2.1	2.1	1.9	2.9
C20:3 N6	1.1	1.0	0.3	1.8
C22:0*	0.0	0.0	0.0	0.0
C20:4 N7	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0
C20:4N6*	5.8	6.3	4.9	7.8
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.2	0.0	0.0	0.3
C20:4 N3	0.1	0.4	0.0	0.7
C20:5 N3*	13.2	12.1	5.7	12.1
C24:0*	0.3	0.0	0.0	0.0
C22:4 N9	0.0	0.0	0.0	0.0
C24:1 N9*	0.3	0.3	0.2	0.4
C22:5 N6*	0.6	0.4	0.2	0.7
C22:5 N3*	3.9	3.6	3.2	4.4
C22:6 N3*	39.7	36.3	31.3	33.2
Sum of FAME %	100.00	100.0	100.0	100.0

[0146] *ATCC 20889* – The lipid content of the biomass was estimated to be 3.3% as the sum of FAME, and the amount of crude oil obtained after solvent extraction was 3.4% by weight, giving a 103% recovery of fat present in the biomass. The EPA and DHA content of the biomass was determined to be 2.3 mg/g and 16.5 mg/g, respectively. The extracted crude oil contained 26.8 mg/g EPA and 205.1 mg/g DHA. The isolated TAG contained 7.3 mg/g EPA and 185.9 mg/g DHA, while the isolated PL contained 35.2 mg/g EPA and 218.6 mg/g DHA. The total fatty acid profiles of the biomass, extracted crude oil, TAG

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fraction, and PL fraction are shown below in Table 26 and Table 27 calculated as mg/g and % FAME, respectively.

Table 26: Fatty Acid Profile of ATCC 20889 Calculated as Milligrams per Gram

Fatty Acid	Biomass FAME (mg/g)	Crude Oil FAME (mg/g)	TAG FAME (mg/g)	PL FAME (mg/g)
C12:0*	0.0	0.0	0.0	0.0
C14:0*	0.5	8.3	32.0	2.8
C14:1*	0.0	0.0	0.0	0.0
C15:0	0.0	0.0	0.0	0.1
C16:0*	6.6	80.3	150.8	50.4
C16:1*	0.1	1.7	12.3	0.0
C18:0*	0.3	4.8	9.7	1.6
C18:1 N9*	0.6	6.6	7.6	1.2
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	0.4	1.1	0.1
C20:0*	0.0	0.1	2.1	0.0
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0
C20:2 N6*	0.0	0.0	0.0	0.0
C20:3 N6	0.0	0.1	0.7	0.1
C22:0*	0.0	0.0	0.1	0.0
C20:4 N7	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0
C20:4N6*	0.4	1.4	1.1	7.2
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0
C20:4 N3	0.0	0.5	0.9	0.5
C20:5 N3*	2.3	26.8	7.3	35.2
C24:0*	0.1	0.4	1.8	0.0
C22:4 N9	0.0	3.4	0.2	2.8
C24:1 N9*	0.0	0.0	0.8	0.3
C22:5 N6*	5.0	63.6	76.2	45.9
C22:5 N3*	0.2	1.8	2.2	2.0
C22:6 N3*	16.5	205.1	185.9	218.6
Sum of all FAME	32.8	405.2	493.0	368.7

Table 27: Fatty Acid Profiles of ATCC 20889 Calculated as a Percent of Total FAME

	Biomass	Crude Oil	TAG	PL
Fatty Acid	% FAME	% FAME	% FAME	% FAME
C12:0*	0.0	0.0	0.0	0.0
C14:0*	1.4	2.0	6.5	0.8
C14:1*	0.0	0.0	0.0	0.0
C15:0	0.0	0.0	0.0	0.0
C16:0*	20.3	19.8	30.6	13.7
C16:1*	0.4	0.4	2.5	0.0
C18:0*	0.8	1.2	2.0	0.4
C18:1 N9*	1.8	1.6	1.5	0.3
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	0.1	0.1	0.2	0.0
C20:0*	0.0	0.0	0.4	0.0
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.0	0.0	0.0
C20:2 N6*	0.0	0.0	0.0	0.0
C20:3 N6	0.0	0.0	0.1	0.0
C22:0*	0.0	0.0	0.0	0.0
C20:4 N7	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0
C20:4N6*	1.3	0.4	0.2	2.0
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0
C20:4 N3	0.1	0.1	0.2	0.1
C20:5 N3*	7.0	6.6	1.5	9.5
C24:0*	0.3	0.1	0.4	0.0
C22:4 N9	0.0	0.8	0.0	0.8
C24:1 N9*	0.0	0.0	0.2	0.1
C22:5 N6*	15.3	15.7	15.5	12.5
C22:5 N3*	0.5	0.5	0.5	0.5
C22:6 N3*	50.2	50.6	37.7	59.3
Sum of FAME %	100.0	100.0	100.0	100.0

[0147] *ATCC 20892* – The lipid content of the biomass was estimated to be 8.8% as the sum of FAME, and the amount of crude oil obtained after solvent extraction was 12.1% by weight, giving a 138% recovery of fat present in the biomass. The EPA and DHA content of the biomass was determined to be 8.3 mg/g and 43.3 mg/g, respectively. The extracted crude oil contained 50.5 mg/g EPA and 260.1 mg/g DHA. The isolated TAG contained 98.7 mg/g EPA and 407.7 mg/g DHA, while the isolated PL contained 50.4 mg/g EPA and 243.12 mg/g DHA. The total fatty acid profiles of the biomass, extracted

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crude oil, TAG fraction, and PL fraction are shown below in Table 28 and Table 29 calculated as mg/g and % FAME, respectively.

Table 28: Fatty Acid Profile of ATCC 20892 Calculated as Milligrams per Gram

	Biomass	Crude Oil	TAG	PL
Fatty Acid	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)	FAME (mg/g)
C12:0*	0.0	0.0	0.0	0.0
C14:0*	7.3	42.2	29.7	54.7
C14:1*	0.0	0.0	0.0	0.2
C15:0	0.0	0.0	0.0	0.0
C16:0*	18.9	109.0	133.5	116.7
C16:1*	0.0	0.8	3.5	0.2
C18:0*	0.0	2.6	9.1	0.7
C18:1 N9*	0.6	7.3	22.0	1.3
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	1.4	9.7	0.4
C20:0*	0.0	0.0	0.0	0.0
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.6	0.0	0.1
C20:2 N6*	0.0	0.0	0.0	0.0
C20:3 N6	0.3	1.1	6.3	0.6
C22:0*	0.0	0.0	0.0	0.0
C20:4 N7	0.0	0.0	0.0	0.0
C20:3 N3	0.0	0.0	0.0	0.0
C20:4N6*	1.3	7.6	15.8	7.8
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0
C20:4 N3	0.3	1.5	4.7	1.4
C20:5 N3*	8.3	49.6	97.0	49.8
C24:0*	0.0	0.0	0.0	0.0
C22:4 N9	0.2	0.0	0.0	0.1
C24:1 N9*	0.0	1.1	4.9	1.0
C22:5 N6*	2.8	16.1	25.3	15.8
C22:5 N3*	1.1	6.6	23.9	6.0
C22:6 N3*	43.4	254.3	398.3	239.5
Sum of all FAME	87.5	508.0	800.7	498.2

Table 29: Fatty Acid Profiles of ATCC 20892 Calculated as a Percent of Total FAME

	Biomass	Crude Oil	TAG	PL
Fatty Acid	% FAME	% FAME	% FAME	% FAME
C12:0*	0.0	0.0	0.0	0.0
C14:0*	8.3	8.3	3.6	11.0
C14:1*	0.0	0.0	0.0	0.0
C15:0	0.0	0.0	0.0	0.0
C16:0*	21.6	21.4	16.4	23.4
C16:1*	0.0	0.2	0.5	0.0
C18:0*	0.0	0.5	1.1	0.1
C18:1 N9*	0.7	1.4	2.6	0.2
C18:1 N7	0.0	0.0	0.0	0.0
C18:2 N6*	0.0	0.2	1.1	0.1
C20:0*	0.0	0.1	0.6	0.0
C18:3 N3*	0.0	0.0	0.0	0.0
C20:1 N9*	0.0	0.0	0.0	0.0
C18:4 N3	0.0	0.1	0.0	0.0
C20:2 N6*	0.0	0.0	0.0	0.0
C20:3 N6	0.3	0.2	0.7	0.1
C22:0*	0.0	0.0	0.0	0.0
C20:4 N7	1.9	0.8	1.6	0.2
C20:3 N3	0.0	0.0	0.0	0.0
C20:4N6*	1.4	1.5	1.9	1.6
C22:1 N9*	0.0	0.0	0.0	0.0
C20:4 N5	0.0	0.0	0.0	0.0
C20:4 N3	0.3	0.3	0.5	0.3
C20:5 N3*	9.5	9.7	11.9	10.0
C24:0*	0.0	0.0	0.0	0.0
C22:4 N9	0.2	0.0	0.0	0.0
C24:1 N9*	0.0	0.2	0.5	0.2
C22:5 N6*	3.2	3.1	3.0	3.2
C22:5 N3*	1.3	1.2	2.8	1.2
C22:6 N3*	49.6	49.8	49.0	48.0
Sum of FAME %	100.0	100.0	100.0	100.0

[0148] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

WHAT IS CLAIMED:

1. An isolated thraustochytrid microorganism of the thraustochytrid species deposited under ATCC Accession No. PTA-9695 or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
2. An isolated thraustochytrid microorganism having the characteristics of the thraustochytrid species deposited under ATCC Accession No. PTA-9695, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
3. An isolated thraustochytrid microorganism, or a strain derived therefrom, comprising a triglyceride fraction, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, and wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight of eicosapentaenoic acid.
4. An isolated thraustochytrid microorganism of the same species as the thraustochytrid deposited under ATCC Accession No. PTA-9695, or a strain derived therefrom, wherein the total fatty acids produced by said microorganism or strain derived therefrom comprise about 10% or less by weight eicosapentaenoic acid.
5. The isolated thraustochytrid microorganism of any one of claims 1 to 4, wherein the strain derived therefrom is a mutant strain.
6. An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9695.
7. An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9696.
8. An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9697.

9. An isolated thraustochytrid microorganism deposited under ATCC Accession No. PTA-9698.
10. A thraustochytrid biomass comprising the thraustochytrid microorganism of any one of claims 1 to 9 or mixtures thereof.
11. An isolated thraustochytrid biomass, wherein at least about 50% by weight of the dry cell weight of the biomass are fatty acids, and wherein at least about 50% by weight of the fatty acids are omega-3 fatty acids.
12. The isolated thraustochytrid biomass of claim 11, wherein at least about 50% by weight of the fatty acids is docosahexaenoic acid.
13. An isolated thraustochytrid biomass, wherein at least about 25% by weight of the dry cell weight of the biomass is docosahexaenoic acid.
14. The isolated thraustochytrid biomass of any one of claims 10 to 13, wherein about 10% or less by weight of the fatty acids is eicosapentaenoic acid, and wherein the weight ratio of docosahexaenoic acid to eicosapentaenoic acid is at least about 5:1.
15. The isolated thraustochytrid biomass of any one of claims 10 to 14, wherein about 1.5% or less by weight of the fatty acids is arachidonic acid, and wherein the weight ratio of docosahexaenoic acid to arachidonic acid is at least about 20:1.
16. The isolated thraustochytrid biomass of any one of claims 10 to 15, further comprising docosahexaenoic acid and docosapentaenoic acid n-6 in a weight ratio of at least about 10:1.
17. An isolated thraustochytrid culture comprising the thraustochytrid microorganism of any one of claims 1 to 9 or mixtures thereof.
18. The isolated thraustochytrid culture of claim 17, further comprising at least about 5% dissolved oxygen.
19. A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the thraustochytrid microorganism or thraustochytrid biomass of any one of claims 1 to 16 or mixtures thereof.

Atty. Dkt. No. 2715.0030000/JUK/SAS

20. A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 50% by weight, and wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from about 0.5% by weight to about 6% by weight.
21. The microbial oil of claim 20, further comprising an arachidonic acid content of the triglyceride fraction of about 1.5% or less by weight.
22. A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least about 0.5% by weight to about 6% by weight, and wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than about 6:1.
23. A microbial oil comprising a triglyceride fraction of at least about 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least about 60% by weight.
24. The microbial oil of any one of claims 20 to 23, wherein at least about 20% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions.
25. The microbial oil of any one of claims 20 to 23, wherein at least about 5% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at all three of the *sn*-1, *sn*-2, and *sn*-3 positions in the triglyceride.
26. The microbial oil of any one of claims 20 to 23, further comprising about 5% by weight or less of heptadecanoic acid.
27. A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the microbial oil of any one of claims 20 to 26.
28. The food product of claim 19 or claim 27, wherein the food product is an infant formula.
29. The food product of claim 28, wherein the infant formula is suitable for premature infants.

30. The food product of claim 19 or claim 27, wherein the food product is milk, a beverage, a therapeutic drink, a nutritional drink, or a combination thereof.
31. The food product of claim 19 or claim 27, wherein the food product is an additive for animal or human food.
32. The food product of claim 19 or claim 27, wherein the food product is a nutritional supplement.
33. The food product of claim 19 or claim 27, wherein the food product is an animal feed.
34. The animal feed of claim 33, wherein the animal feed is an aquaculture feed.
35. The animal feed of claim 33, wherein the animal feed is a domestic animal feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.
36. A method for producing a microbial oil comprising omega-3 fatty acids, the method comprising:
 - (a) growing the isolated thraustochytrid microorganism of any one of claims 1 to 9 or mixtures thereof in a culture to produce a biomass, and
 - (b) extracting an oil comprising omega-3 fatty acids from the biomass.
37. The method of claim 36, wherein the culture comprises at least about 5% dissolved oxygen.
38. The method of claim 36, wherein the culture pH is maintained at about 6.5 to about 8.5.
39. The method of claim 36, wherein the culture temperature is maintained at about 17 °C to about 30 °C.
40. The method of claim 36, wherein the culture comprises a glucose concentration of about 5 g/L to about 50 g/L.
41. A method for producing a microbial oil comprising omega-3 fatty acids, the method comprising extracting an oil comprising omega-3 fatty acids from the biomass of any one of claims 10 to 16.

42. The method of claim 41, wherein the microbial oil comprising omega-3 fatty acids is extracted using a hexane extraction process.
43. The method of claim 41, wherein the microbial oil comprising omega-3 fatty acids is extracted using a solventless extraction process.
44. The method of any one of claims 36 to 43, or the isolated thraustochytrid culture of claim 17 or claim 18, wherein the dry cell weight of biomass isolated from each liter of culture is at least about 50 g after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.
45. The method of any one of claims 36 to 43, or the isolated thraustochytrid culture of claim 17 or claim 18, wherein the omega-3 fatty acids productivity is at least about 2 g/L/day after growing for about 7 days at about 17°C to about 30°C in a culture medium of about pH 6.5 to about pH 8.0 comprising sources of carbon, nitrogen, and nutrients, and about 950 ppm to about 8500 ppm chloride ions.
46. A microbial oil produced by the method of any one of claims 36 to 45.
47. Use of the isolated microorganism, biomass, or microbial oil of any one of claims 1 to 16, 20 to 26, 46, or mixtures thereof, for the manufacture of a medicament for the treatment of inflammation or a condition related thereto.
48. Use of the isolated microorganism, biomass, or microbial oil of any one of claims 1 to 16, 20 to 26, 46, or mixtures thereof, for the treatment of inflammation or a condition related thereto.
49. The isolated microorganism, biomass, or microbial oil of any one of claims 1 to 16, 20 to 26, 46, or mixtures thereof, for use in the treatment of inflammation or a condition related thereto.
50. A method for treating inflammation or a condition related thereto in a subject in need thereof, comprising administering to the subject the isolated microorganism, biomass, or microbial oil of any one of claims 1 to 16, 20 to 26, 46, or mixtures thereof, and a pharmaceutically acceptable carrier.

ABSTRACT

The present invention is directed to isolated thraustochytrid microorganisms as well as strains and mutants thereof. The invention is further directed to biomasses, microbial oils, compositions, cultures, methods of producing microbial oils, and methods of using the isolated thraustochytrids, biomasses, and microbial oils.

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Electronic Acknowledgement Receipt

EFS ID:	5001504
Application Number:	12407687
International Application Number:	
Confirmation Number:	7806
Title of Invention:	Thraustochytrids, Fatty Acid Compositions, and Methods of Making and Uses Thereof
First Named Inventor/Applicant Name:	Kirk E. APT
Customer Number:	26111
Filer:	Scott A. Schaller/Kim Perry
Filer Authorized By:	Scott A. Schaller
Attorney Docket Number:	2715.0030000/JUK/SAS
Receipt Date:	19-MAR-2009
Filing Date:	
Time Stamp:	18:54:00
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		27150030000.pdf	313236	yes	8
			c6d3b5fc392c74b3be120cd3524e165d283b61a3		

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Miscellaneous Incoming Letter		1	2	
	Transmittal of New Application		3	3	
	Authorization for Extension of Time all replies		4	4	
	Application Data Sheet		5	8	
Warnings:					
Information:					
2		27150030000_APPLN.pdf	3894388	yes	81
		712e08882964a3e45d2e4b853d2409d6a1ae5d73			
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	75	
	Claims		76	80	
	Abstract		81	81	
Warnings:					
Information:					
3	Sequence Listing (Text File)	27150030000_SEQLIST.txt	10531	no	0
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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.



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March 19, 2009

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

Re: U.S. Non-Provisional Utility Patent Application under 37 C.F.R. § 1.53(b)
Appl. No.: To be assigned; Filed: Herewith (March 19, 2009)
For: **Thraustochytrids, Fatty Acid Compositions, and Methods of Making
and Uses Thereof**
Inventors: APT *et al.*
Our Ref: 2715.0030000/JUK/SAS

Sir:

The following documents are transmitted herewith for appropriate action by the U.S.
Patent and Trademark Office:

1. Utility Patent Application Transmittal Form (PTO/SB/05);
2. Authorization to Treat a Reply As Incorporating An Extension of Time
Under 37 C.F.R. § 1.136(a)(3);
3. U.S. Utility Patent Application entitled:

**Thraustochytrids, Fatty Acid Compositions, and Methods of Making and
Uses Thereof**

and naming as inventors:

Kirk E. APT
Joseph W. PFEIFER III
Jon Milton HANSEN
Paul Warren BEHRENS
Ross ZIRKLE and
Tracey Lynn STAHL

Commissioner for Patents

March 19, 2009

Page 2

the application consisting of:

- a. An Application Data Sheet (37 C.F.R. § 1.76);
- b. a specification containing:
 - i. 75 pages of description prior to the claims;
 - ii. 5 pages of claims (50 claims);
 - iii. a one (1) page abstract; and
- c. 6 pages of a sequence listing in ASCII text file format.

The above-listed documents are filed electronically through EFS-Web.

Correspondence should be sent to Customer Number 26111.

This patent application is being submitted under 37 C.F.R. § 1.53(b) without Declaration and without filing fee.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Scott A. Schaller
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JUK/SAS/wks
Enclosures
946733_1.DOC

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MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET Substitute for Form PTO-1360 (For use with Form PTO/SB/06)							Application Number 12407687		Filing Date 03/19/09		
							Applicant(s)				
							* May be used for additional claims or amendments				
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT						
	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend	
1	1						51				
2	1						52				
3	1						53				
4	1						54				
5		4					55				
6	1						56				
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50		1					100				
Total							Total				
Indep	13						Indep				
Total							Total				
Depend	49						Depend				
Total							Total				
Claims	62						Claims				

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.

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Filing Date: 03/19/09

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/407,687		
APPLICATION AS FILED – PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OR	
OTHER THAN SMALL ENTITY							
FOR	NUMBER FILED	NUMBER EXTRA		RATE (\$)	SMALL ENTITY	RATE (\$)	LARGE ENTITY
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A		N/A	330
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A		N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A		N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	62	minus 20 =	42	X\$ 25	1092	X\$50	2184
INDEPENDENT CLAIMS (37 CFR 1.16(h))	13	minus 3 =	10	X\$100	1100	X\$210	2200
APPLICATION SIZE FEE (37 CFR 1.16(s))					0		0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				195	0	390	390
				TOTAL	2192	TOTAL	5864
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED – PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
OTHER THAN SMALL ENTITY							
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	Minus **	=	X =		X =	
	Independent (37 CFR 1.16(h))	Minus ***	=	X =		X =	
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			N/A		N/A	
				TOTAL ADD'T FEE		TOTAL ADD'T FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
OTHER THAN SMALL ENTITY							
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	Minus **	=	X =		X =	
	Independent (37 CFR 1.16(h))	Minus ***	=	X =		X =	
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			N/A		N/A	
				TOTAL ADD'T FEE		TOTAL ADD'T 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.							

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.**

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