

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HANGSEN INTERNATIONAL GROUP LTD.

Petitioner

v.

ZANOPRIMA LIFESCIENCES, LTD.,

Patent Owner

IPR2023-_____

U.S. Patent No. 10,913,962

DECLARATION OF SYLVIA HALL-ELLIS, PH.D.

1. I, Sylvia D. Hall-Ellis, Ph.D., declare as follows:

I. INTRODUCTION

2. My name is Sylvia D. Hall-Ellis. I have been retained as an expert by Hangsen International Group Ltd., who I am informed is the Petitioner in this IPR proceeding (“Petitioner”).

3. I have written this declaration at the request of the Petitioner to provide my expert opinion regarding the public availability and authenticity of a number of publications identified in Section V below. My Declaration sets forth my opinions in detail and provides the basis for my opinions regarding the authenticity and public availability of these publications. If called to testify in the above-captioned matter, I will testify with regard to the opinions and bases set forth below.

4. I reserve the right to supplement or amend my opinions, and bases for them, in response to any additional evidence, testimony, discovery, argument, and/or other additional information that may be provided to me after the date of this Declaration.

5. I am being compensated for my time spent working on this matter at my normal consulting rate of \$325 per hour, plus reimbursement for any additional reasonable expenses. My compensation is not in any way tied to the content of this report, the substance of my opinions, or the outcome of this proceeding. I have no other interests in this proceeding or with any of the parties.

6. All of the materials that I considered and relied upon are discussed explicitly in this declaration.

II. QUALIFICATIONS

7. I am currently an Adjunct Professor in the School of Information at San José State University in San José, California. I obtained a Master of Library Science from the University of North Texas in 1972 and a Ph. D. in Library Science from the University of Pittsburgh in 1985. Over the last fifty years, I have held various positions in the field of library and information resources. I was first employed as a librarian in 1966 and have been involved in the field of library sciences since, holding numerous positions.

8. I am a member of the American Library Association (ALA) and its Association for Library Collections & Technical Services (ALCTS) Division, and I served on the Committee on Cataloging: Resource and Description (which wrote the new cataloging rules) and as the chair of the Committee for Education and Training of Catalogers and the Competencies and Education for a Career in Cataloging Interest Group. I also served as the Chair of the ALCTS Division's Task Force on Competencies and Education for a Career in Cataloging. Additionally, I have served as the Chair for the ALA Office of Diversity's Committee on Diversity, as a member of the REFORMA National Board of Directors, as a member of the Editorial Board for the ALCTS premier cataloging journal, *Library Resources and Technical*

Services, and as a Membership Committee Co-Chair for the Library Research Round Table (LRRT) of the American Library Association. Currently I serve as a member of the LRRT Nominating Committee.

9. I have also given over one hundred presentations in the field, including several on library cataloging systems and Machine-Readable Cataloging (“MARC”) standards. My current research interests include library cataloging systems, metadata, and organization of electronic resources.

10. My full curriculum vitae is attached hereto as **Attachment A**.

III. PRELIMINARIES

A. Scope of Declaration and Legal Standards

11. I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the documents referenced herein and on when and how each of these documents was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, could have located the documents before the dates discussed below with respect to the specific documents.

12. I am informed by counsel that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could

locate it through the exercise of ordinary diligence.

13. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person interested in the relevant subject matter could locate it (*i.e.*, I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as publicly accessible). One manner of sufficient indexing is indexing according to subject matter category. I understand that the cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient, even if the single library is in a foreign country. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein is publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

14. I understand that routine business practices, such as general library

cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible. I also understand that the indicia on the face of a reference, such as printed dates and stamps, are considered as part of the totality of the evidence.

B. Persons of Ordinary Skill in the Art

15. I am informed by counsel that the subject matter of this proceeding generally relates to techniques for synthesizing (S)-nicotine using a biocatalyst.

16. I have been informed by counsel that a “person of ordinary skill in the art at the time of the invention” is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the invention. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

17. I am informed by counsel that a person of ordinary skill in this subject matter or art would typically be someone who has a Ph.D. in organic chemistry or biochemistry with at least several years of research experience gained during those Ph.D. studies or afterwards in the area of organic synthesis, including chiral synthesis, and the use of enzymes in reactions. I am informed that alternatively, a person of ordinary skill in the art could have a lesser academic degree, but with a number of years of experience sufficient to develop equivalent experience in synthetic organic chemistry, such as in pharmaceutical applications or in the chiral

synthesis of compounds with biological activity. I have further been informed by counsel that a person of ordinary skill in the art would have been familiar with and able to understand the information known in the art relating to these fields, including the publications discussed in this declaration.

C. Use of Authoritative Databases

18. In preparing this report, I used authoritative databases, such as the OCLC bibliographic database and the Library of Congress Online Catalog, to confirm citation details of the publication discussed. Unless I note otherwise below in reference to a specific serial publication, it is my expert opinion that this standard protocol was followed for the publications discussed in Section V below.

19. *Indexing.* A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodical and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in libraries, or purchase it from the publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both indexing and library date information.

20. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The formats in which these access terms are presented vary from service to service.

21. Online indexing services and digital repositories commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document.

22. *ResearchGate*.¹ *ResearchGate* is a social networking site for scientists and researchers to share papers, ask and answer questions, and find collaborators. According to a 2014 study by Nature and a 2016 article in Times Higher Education, it is the largest academic social network in terms of active users, although other services have more registered users, and a 2015–2016 survey suggests that almost as many academics have Google Scholar profiles. Features available to *ResearchGate* members include following a research interest and the work of other individual participants, a blogging feature for users to write short reviews on peer-reviewed articles, private chat rooms for sharing data, editing documents, or discussing confidential topics, and a research-focused job board. *ResearchGate* indexes self-published information on user profiles and suggests members to connect with others who have similar interests. Member questions are fielded to others who have identified relevant expertise on their profiles.

¹ www.researchgate.net

23. As of 2018, *ResearchGate* had more than 15 million users, with its largest user-bases coming from Europe and North America. Most of *ResearchGate*'s users are involved in medicine, biology, engineering, computer science, agricultural sciences, and psychology. *ResearchGate* publishes a citation impact measurement in the form of an "RG Score," which is reported to be correlated with existing citation impact measures. *ResearchGate* does not charge fees for putting content on the site and does not require peer review.

D. Summary of Opinions

24. I am informed by counsel that the earliest possible effective filing date for the patent at issue is November 16, 2018. As I will explain below, it is my opinion that the publications discussed in my Declaration were publicly accessible before November 16, 2018.

IV. LIBRARY CATALOGING PRACTICES

A. MARC Records

25. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method of storing and organizing library catalog information. MARC was first developed in the 1960s by the Library of Congress. A MARC-compatible library is one that has a catalog consisting of individual MARC records for works made available at that library.

26. Since at least the early 1970s and continuing to the present day, MARC has been the primary communications protocol for the transfer and storage of

bibliographic metadata in libraries.² As explained by the Library of Congress:

27. You could devise your own method of organizing the bibliographic information, but you would be isolating your library, limiting its options, and creating much more work for yourself. Using the MARC standard prevents duplication of work and allows libraries to better share bibliographic resources. Choosing to use MARC enables libraries to acquire cataloging data that is predictable and reliable. If a library were to develop a “home-grown” system that did not use MARC records, it would not be taking advantage of an industry-wide standard whose primary purpose is to foster communication of information.

28. Using the MARC standard also enables libraries to make use of commercially available library automation systems to manage library operations. Many systems are available for libraries of all sizes and are designed to work with the MARC format. Systems are maintained and improved by the vendor so that libraries can benefit from the latest advances in computer technology. The MARC standard also allows libraries to replace one system with another with the assurance that their data will still be compatible.

29. *Why Is a MARC Record Necessary?* LIBRARY OF CONGRESS,

² A complete history of the development of MARC can be found in *MARC: Its History and Implications* by Henrietta D. Avram (Washington, DC: Library of Congress, 1975) and available online from the Hathi Trust (<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034388556;view=1up;seq=1>; last visited December 29, 2022).

<http://www.loc.gov/marc/umb/um01to06.html#part2> (last visited December 29, 2022).

30. Thus, almost every major library in the world is MARC-compatible. *See, e.g., MARC Frequently Asked Questions (FAQ)*, LIBRARY OF CONGRESS, <https://www.loc.gov/marc/faq.html> (last visited December 29, 2022) (“MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began nearly fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 standard (reaffirmed in 2016) for Information Interchange Format. The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/> (last visited December 29, 2022).

31. A MARC record comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique, three-digit code corresponding to the type of data that follow. *See, e.g.,* <http://www.loc.gov/marc/umb/um07to10.html> (last visited December 29, 2022); <http://www.loc.gov/marc/bibliographic/> (last visited December 29, 2022). For example, a work’s title is recorded in field 245, the primary author of the work is recorded in field 100, a work’s International Standard Book Number (“ISBN”) is

recorded in field 020, a work's International Standard Serial Number ("ISSN") is recorded in field 022, and the publication date is recorded in field 260 under the subfield "c." *Id.*³ If a work is a periodical, then its publication frequency is recorded in field 310, and the publication dates (e.g., the first and last publication) are recorded in field 362, which is also referred to as the enumeration/chronology field. See <http://www.loc.gov/marc/bibliographic/bd3xx.html> (last visited December 29, 2022).⁴

32. The library that initially created the MARC record is reflected in field 040 in subfield "a" with that library's unique library code. See, e.g., <https://www.loc.gov/marc/bibliographic/bd040.html> (last visited December 29, 2022); <http://www.loc.gov/marc/bibliographic/> (last visited December 29, 2022).

³ In some MARC records, field 264 is used rather than field 260 to record publication information. See <http://www.loc.gov/marc/bibliographic/bd264.html> (last visited December 29, 2022) ("Information in field 264 is similar to information in field 260 (Publication, Distribution, etc. (Imprint)). Field 264 is useful for cases where the content standard or institutional policies make a distinction between functions").

⁴ Upwards of two-thirds to three-quarters of book sales to libraries come from a jobber or wholesaler for online and print resources. These resellers make it their business to provide books to their customers as fast as possible, often providing turnaround times of only a single day after publication. Libraries purchase a significant portion of the balance of their books directly from publishers themselves, which provide delivery on a similarly expedited schedule. In general, libraries make these purchases throughout the year as the books are published and shelve the books as soon thereafter as possible to make the books available to their patrons. Thus, books are generally available at libraries across the country within just a few days of publication.

Once a MARC record for a particular work is originally created by one library, other libraries can use that original MARC record to then create their own MARC records for their own copies of the same work. These other libraries may modify or add to the original MARC record as necessary to reflect data specific to their own copies of the work. However, the library that created the original MARC record would still be reflected in these modified MARC records (corresponding to other copies of the same work at other libraries) in field 040, subfield “a”. The modifying library (or libraries) is reflected in field 040, subfield “d”. See <http://www.loc.gov/marc/bibliographic/bd040.html> (last visited December 29, 2022).

33. I consulted the Directory of OCLC Libraries (<http://www.oclc.org/contacts/libraries.en.html>; last visited December 29, 2022) in order to identify the institution that created or modified the MARC record. Moreover, when viewing the MARC record online via Online Computer Library Center’s (“OCLC”) bibliographic database, which I discuss further below, hovering over a library code in field 040 with the mouse reveals the full name of the library. I also used this method of “mousing over” the library codes in the OCLC database to identify the originating and modifying libraries for the MARC records discussed in this Declaration.

34. MARC records also include one or more fields that show information

regarding subject matter classification. For example, 6XX fields are termed “Subject Access Fields.” See <http://www.loc.gov/marc/bibliographic/bd6xx.html> (last visited December 29, 2022). Among these, for example, is the 650 field; this is the “Subject Added Entry – Topical Term” field. See <http://www.loc.gov/marc/bibliographic/bd650.html> (last visited December 29, 2022). The 650 field is a “[s]ubject added entry in which the entry element is a topical term.” *Id.* These entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (e.g., *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH)).” *Id.*

35. Further, MARC records can include call numbers, which themselves contain a classification number. For example, a MARC record may identify a 050 field, which is the “Library of Congress Call Number.” See <http://www.loc.gov/marc/bibliographic/bd050.html> (last visited December 29, 2022). A defined portion of the Library of Congress Call Number is the classification number, and “source of the classification number is *Library of Congress Classification* and the *LC Classification-Additions and Changes*.” *Id.* Thus, the 050 field may be used to show information regarding subject matter classification. As another example, a MARC record may identify a 082 field, which is the “Dewey Decimal Classification Number.” See <http://www.loc.gov/marc/bibliographic/bd082.html> (last visited December 29,

2022). A defined portion of the Dewey Decimal Classification Number is the classification number, and “source of the classification number is the Dewey Decimal Classification and Relative Index,” which is published online. *Id.* Thus, the 082 field may be used to show information regarding subject matter classification consistent with the Dewey Decimal Classification System.

36. Each item in a library has a single classification number. A library selects a classification scheme (*e.g.*, the Library of Congress Classification scheme just described or a similar scheme such as the Dewey Decimal Classification scheme) and uses it consistently. When the Library of Congress assigns the classification number, it appears as part of the 050 field, as discussed above. For MARC records created by libraries other than the Library of Congress (*e.g.*, a university library or a local public library), the classification number may appear in a 09X (*e.g.*, 090) field. See <http://www.loc.gov/marc/bibliographic/bd09x.html> (last visited December 29, 2022).

37. When a MARC-compatible library acquires a work, it creates a MARC record for its copy of the work in its computer catalog system in the ordinary course of its business. This MARC record (for the copy of a work available at the particular library) may be later accessed by researchers in a number of ways. For example, many libraries, including the Library of Congress, make their MARC records available through their website. As an example, the MARC record for the copy of

The Unlikely Spy, by Daniel Silva,⁵ available at the Library of Congress can be viewed through the Library of Congress website, at <https://catalog.loc.gov/vwebv/staffView?searchId=20265&recPointer=1&recCount=25&bibId=2579985> (last visited December 29, 2022). One could, of course, always physically visit the library at which the work is available, and request to see that library's MARC record for the work. Moreover, members of the Online Computer Library Center ("OCLC") can access the MARC records of other member institutions through OCLC's online bibliographic database, as I explain further below.

B. OCLC

38. The OCLC was created "to establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries, including such objectives as increasing availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific, literary and educational knowledge and information."⁶ Among other services, OCLC and

⁵ *The Unlikely Spy* is a 1996 novel written by Daniel Silva, who happens to be one of my favorite authors.

⁶ Third Article, Amended Articles of Incorporation of OCLC Online Computer

its members are responsible for maintaining the WorldCat database (<http://www.worldcat.org/>; last visited December 29, 2022), used by independent and institutional libraries throughout the world. All libraries that are members of OCLC are MARC-compatible. *See, e.g.,* https://help.oclc.org/Metadata_Services/OCLC_MARC_records/Get_started/About_OCLC_MARC_records (last visited December 29, 2022) (“OCLC-MARC records describes records produced since November 1993.”). Parallel to the two superseded OCLC documents, this revised set of guidelines is intended to assist catalogers in creating records for electronic resources in WorldCat, the OCLC Online Union Catalog. These guidelines pertain to OCLC-MARC tagging (that is, content designation). Cataloging rules and manuals govern the content of records and should be implemented immediately at the local library.

39. When an OCLC member institution acquires a publication, like the other MARC-compatible libraries discussed above, it creates a MARC record for this publication in its computer catalog system in the ordinary course of its business. MARC records created at the Library of Congress were tape-loaded into the OCLC database through a subscription to MARC Distribution Services daily or weekly. Once the MARC record is created by a cataloger at an OCLC member library and

Library Center, Incorporated (available at <https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>; last visited December 29, 2022).

contributed by the Library of Congress, the MARC record is then made available to any other OCLC members online, and thereby made available to the public. Accordingly, once the MARC record is created by a cataloger at an OCLC member library and contributed to the OCLC bibliographic database, any publication corresponding to the MARC record has been cataloged and indexed according to its subject matter such that a person interested in that subject matter could, with reasonable diligence, locate and access the publication through any library with access to the OCLC bibliographic database or through the Library of Congress.

40. When a MARC-compatible library creates an original MARC record for a work, the library records the date of creation of that MARC record in **field 008**, characters 00 through 05, in the ordinary course of its business. *See* <http://www.loc.gov/marc/bibliographic/bd008a.html> (last visited December 29, 2022). For OCLC member institutions that use OCLC software to create original MARC records, the date of creation in field 008 is automatically supplied by the OCLC software. The MARC record creation date in field 008 thus reflects the date on which, or shortly after which, a work was first acquired and cataloged by the library that created the original MARC record.

41. When other MARC-compatible libraries subsequently acquire their own copies of the same work, as mentioned, they create MARC records in their own

computer catalog systems for their copies in the ordinary course of business.⁷ They may use a MARC record previously created for that work (e.g., by another MARC-compatible library) to create their own MARC records for their own copies of that same work.⁸ The previously created MARC record used by subsequently-acquiring libraries to create MARC records for their own copies may be obtained through the OCLC bibliographic database, as described above. If, when creating a MARC record to represent its own copy of the work, the subsequently-acquiring library uses the master MARC record in its original form, the subsequently-acquiring library cannot reenter data into the 008 field; therefore, the date in the 008 field will continue to reflect the date the MARC record was initially created by the originating library. On the other hand, if the subsequently-acquiring library modifies the previously created MARC record when creating its own MARC record for its own copy of the work, the subsequently-acquiring library may enter into the 008 field of its own MARC record the date its own MARC record was created.⁹ But the library that

⁷ Initial contributions to the bibliographic database for a work are called “master records.”

⁸ When a local library uses a master record in OCLC and produces (or downloads) it to the in-house system, the three-character symbol for the subsequent library is added to the holdings for the work.

⁹ This practice is not required by, but is nevertheless consistent with, the MARC standard. Many MARC records exist today whose 008 fields indicate when the first original MARC record for a work was created, rather than when a derivative record was created based on the original MARC record by a subsequently-acquiring library for its own computer catalog system.

created the original MARC record used by the subsequently-acquiring library would still be reflected in the MARC record of the subsequently-acquiring library in field 040, subfield “a”. Thus, the work identified by any MARC record possessed by any MARC-compatible library would have been accessible to the public at least as of the date shown in the 008 field, or shortly thereafter, either from the library that possesses the MARC record itself, or from the originating library indicated in field 040, subfield “a”. As discussed, a MARC-compatible library in the ordinary course of its business creates a MARC record in its own catalog system for a work when it acquires a copy of that work.

42. Moreover, when a MARC record is created by a library for its own copy of a work, **field 005** is automatically populated with the date that MARC record was created in year, month, day format (YYYYMMDD). See <http://www.loc.gov/marc/bibliographic/bd005.html> (last visited December 29, 2022).¹⁰ Thereafter, the library’s computer system may automatically update the date in field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has been moved to a different shelving location within the library). *Id.*¹¹

¹⁰ Some of the newer library catalog systems also include hour, minute, second (HHMMSS).

¹¹ Field 005 is visible when viewing a MARC record via an appropriate computerized interface. But when a MARC record is printed directly to hardcopy from the OCLC database, the “005” label is not shown. The date in the 005 field instead appears next to the label “Replaced.”

Thus, the work identified by any MARC record possessed by any MARC-compatible library would have been accessible to the public at least as of the date shown in the 005 field, or shortly thereafter, from the library that possesses the MARC record itself. As noted, because the 005 field may be updated each time the library updates its MARC record, the work identified by the MARC record may, in fact, have been accessible to the public from that library much earlier than the date indicated in the 005 field.

43. Based on my personal experience as a professional librarian using the MARC and OCLC resources, it has been my experience that both of these resources were continuously operational and available since at least 1992. Indeed, in the course of my work, I have extensively used both of these resources over the past 30+ years, and I have consistently found the information contained within these resources to be complete and reliable. I have never found the date of accessibility as indicated in fields 008 or 005 to be incorrect. And in only a minute number of cases have I found any errors at all in these records – none of which affected my ability to render an accurate opinion as to accessibility, indexing, or subject headings.

V. PUBLICATIONS IN THIS PROCEEDING

A. “Biocatalysis: Genes to GMP” by Tom Moody (“Moody”) [Exhibit 1004]

44. Exhibit 1004 is a copy of an article published in Volume 36, Number 1 of the *Speciality Chemicals Magazine* found in the British Library. The British

Library sent a copy of the cover of the magazine issue, the table of contents, and a letter from the editor, which are included as Exhibit 1023. The table of contents reflects that the article “Catalysis: Genes to GMP” by Tom Moody (hereafter “Moody”) appears beginning on page 12 of this issue dated January 2016. Exhibit 1004 is a true and correct copy of the Moody article (pages 12-14). I obtained this copy of the article from the Almac Group website¹², and an identical copy appears on the Arran Chemical Company Limited website.¹³

45. Specifically, the text of the article is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. The copies of the article published on the Almac Group website and the Arran Chemical Company Limited website are identical; that these copies are identical indicates that they are authentic copies of the original publication from January 2016. Additionally, the copies of the article bear indicia in the footer of having been published in the January 2016 issue of *Speciality Chemicals Magazine*, and the page numbers match the page numbers listed in the table of contents for that article. Exhibit 1023 was found within the custody of a library – a place where, if authentic, a copy of this journal would likely be.

¹² <https://www.armacgroup.com/knowledge/library/biocatalysis-genes-to-gmp/>

¹³ <https://arranchemical.ie/wp-content/uploads/2018/01/Biocatalysis-Genes-to-GMP.pdf>

46. Attached hereto as Attachment 1a is a true and correct copy of the MARC record for the *Speciality Chemicals Magazine* from the British Library online catalog. The library ownership is indicated by the presence of the library's name in field 852. I personally identified and retrieved the MARC record that is Attachment 1a.

47. Based on finding a print copy of the cover, table of contents, and letter from the editor of the January 2016 issue of *Speciality Chemicals Magazine* in the British Library and MARC record in its online library catalog attached as Attachment 1a, along with the fact that two separate copies of the Moody article were obtained online bearing indicia consistent with its January 2016 publication, including the table of contents copy in Exhibit 1023, it is my opinion that the Moody article published in the *Speciality Chemicals Magazine* was publicly available on or shortly after January 31, 2016.¹⁴ The copy of the Moody article in Exhibit 1004 has no indicators that would question its authenticity.

48. As noted in the holdings information (field 3620), the British Library has received the *Speciality Chemicals Magazine* since February 1981 and continues

¹⁴ The *Speciality Chemicals Magazine* was published every other month and, therefore, new issues were available approximately 60 days. Based on the frequency of publication (see Attachment 1a, field 310) and my years of experience working with serials, it is my opinion that issues would be published by the end of the month. Therefore, a public availability date of January 31, 2016, is reasonable.

to receive the publication. Field 310 of Attachment 1a reads “Bimonthly.” Accordingly, the MARC record for the Moody article corresponds to those issues of the *Speciality Chemicals Magazine* from the time the serial began publication to the present day.

49. Attachment 1a further includes an entry in field 050 (“HD9562.5”)— a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 08204 (“338.476600941”). Attachment 1a further includes a descriptor term reading “Chemical industry \$z Great Britain \$v Periodicals” (see Attachment 1b, Library of Congress sh85022913, Attachment 1c, Library of Congress subject heading sh85056605, and Attachment 1d, Library of Congress subject heading sh85099890) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 1a was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entry. Further, as of April 10, 2004, the MARC record attached hereto as Attachment 1a was accessible through any library with access to the online catalog at the British Library.

50. Attached hereto as Attachment 1e is a true and correct copy of the MARC record for the *Speciality Chemicals Magazine* obtained from the OCLC

bibliographic database. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 1e, that library code is “NSD,” which means that the MARC record for this serial was cataloged as part of the National Serials Data Program at the Library of Congress. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 11233072 on October 5, 1984, as shown in the “Entered” field (“19841005”). The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 1e occurred on November 23, 2018, as shown in the “Replaced” field (“20181123”). I personally identified and retrieved the MARC record that is Attachment 1e.

51. The “BLvl” entry in Attachment 1e is “s,” which indicates that the *Speciality Chemicals Magazine* is a serial publication that is published in print and online. Field 310 of Attachment 1e reads “Bimonthly, \$b <1988-.” Accordingly, the MARC record corresponds to the *Speciality Chemicals Magazine* from the time the serial title began publication and includes the date of the Moody article.

52. Attachment 1e includes a descriptor term reading “Chemical industry \$v Periodicals” (see Attachment 1f, Library of Congress sh2008100319) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 1e was indexed according to its subject matter by

virtue of at least one independently sufficient classification: the field 650 entry. As of October 5, 1984, the MARC record attached hereto as Attachment 1e was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

53. Attachment 1f indicates that the *Speciality Chemicals Magazine* as cataloged at the Library of Congress is currently available from 22 libraries. In view of the above, this issue of the *Speciality Chemicals Magazine* was publicly available on or shortly after January 31, 2016, because by that date it had been cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received at the British Library. For these reasons, it is my opinion that the Moody article was published and accessible to the public on or shortly after January 31, 2016.

B. “Sequence-Based In-silico Discovery, Characterisation, and Biocatalytic Application of a Set of Imine Reductases” by Stefan Velikogne, Verena Resch, Carina Dertnig, Joerg H. Schrittwieser, and Wolfgang Kroutil (“Velikogne”) [Exhibit 1011]

54. Exhibit 1011 is a copy of an article published in Volume 10, Issue 15 of the open access journal titled *ChemCatChem* found in the King Library at San José State University (San José, California). The article “Sequence-Based In-silico

Discovery, Characterisation, and Biocatalytic Application of a Set of Imine Reductases” by Stefan Velikogne, Verena Resch, Carina Dertnig, Joerg H. Schrittwieser, and Wolfgang Kroutil (hereafter “Velikogne”) appears beginning on page 3236 of this issue dated August 13, 2018. Exhibit 1011 is a true and correct copy of the Velikogne article (pages 3236-3246). I obtained this copy of the article from the King Library at San José State University. Specifically, the text of the article is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1011 was found within the custody of a library – a place where, if authentic, a copy of this open access journal would likely be. Exhibit 1011 is a true and correct copy in a condition that creates no suspicion about its authenticity.

55. The Velikogne journal article is available from the Wiley Online Library¹⁵ and the digital repository *ResearchGate*.¹⁶

56. Attached hereto as Attachment 2a is a true and correct copy of the MARC record for the open access journal titled *ChemCatChem* from the King Library at San José State University.¹⁷ I personally identified and retrieved the

¹⁵ <https://chemistry-europe.onlinelibrary.wiley.com/doi/full/10.1002/cctc.201800607>

¹⁶ https://www.researchgate.net/publication/325889494_Sequence-Based_In-silico_Discovery_Characterisation_and_Biocatalytic_Application_of_a_Set_of_Imines_Reductases

¹⁷ <https://csu-sjsu.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma991067597040502>

MARC record that is Attachment 2a. As noted in the holdings information (field 362), the King Library at San José State University has received the open access journal titled *ChemCatChem* since January 2009 and continues to receive the publication.

57. Based on finding a copy of Exhibit 1011 in the King Library at San José State University and MARC record in its online library catalog attached as Attachment 2a, it is my opinion that the Velikogne article published in the open access journal titled *ChemCatChem* was publicly available on or shortly after June 20, 2018, as indicated on the publisher’s website.

58. Field 310 of Attachment 2a reads “Monthly, \$ 2010-<2015>.” Accordingly, the MARC record for Exhibit 1011 corresponds to those issues of the open access journal titled *ChemCatChem* from the time of the serial began publication to the present day.

59. Attachment 2a further includes an entry in field 050 (“QD505 \$b .C446”)—includes a subject matter classification number consistent with the Dewey Decimal classification system. Attachment 2a further includes a descriptor term reading “Catalysis \$v Periodicals” (see Attachment 2b, Library of Congress sh2009118522) in the 650 field. Thus, as of its cataloging, the publication

[901&context=L&vid=01CALS_SJO:01CALS_SJO&lang=en&search_scope=MyInst_and_CI&adaptor=Local%20Search%20Engine&tab=Everything&query=any,contains,chemcatchem&offset=0](#)

corresponding to the MARC record attached hereto as Attachment 2a was indexed according to its subject matter by virtue of at least two independently sufficient classifications: the field 050 entry and the field 650 entry. Further, as of August 12, 2009, the MARC record attached hereto as Attachment 2a was accessible through any library with access to the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the individual library.

60. Attached hereto as Attachment 2c is a true and correct copy of the MARC record for the open access journal titled *ChemCatChem* obtained from the OCLC bibliographic database. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 2c that library code is “DLC,” which means that the MARC record for this serial was cataloged at the Library of Congress. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 459787771 on October 26, 2009, as shown in the “Entered” field (“20091026”). The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 2c occurred on January 24, 2022, as shown in the “Replaced” field (“20220124”). I personally identified and retrieved the MARC record that is Attachment 2c.

61. The “BLvl” entry in Attachment 2c is “s,” which indicates that the open

access journal titled *ChemCatChem* is a serial publication. Field 310 of Attachment 2c reads “Monthly, \$b <2010-.” Accordingly, the MARC record for Exhibit 1011 corresponds to the open access journal titled *ChemCatChem* from the time the serial title began publication and includes the date of the Velikogne article.

62. Attachment 2c includes an entry in field 050 (“QD505 \$b .C463”)—as described above, a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 060 (“W1 \$b CH234”), a subject matter consistent with the National Library of Medicine classification system (analogous to the Dewey Decimal classification system). Attachment 2c further includes a descriptor term reading “Catalysis \$v Periodicals” (see Attachment 2b, Library of Congress sh2009118522) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 2c was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 060 entry, and the field 650 entry. As of October 26, 2009, the MARC record attached hereto as Attachment 2c was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an

individual library.

63. Attachment 2c indicates that the open access journal titled *ChemCatChem* as cataloged at the Library of Congress is currently available from 80 libraries. In view of the above, this issue of the open access journal titled *ChemCatChem* was publicly available on or shortly after June 20, 2018, because by that date it had been cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received in the King Library at San José State University. For these reasons, it is my opinion that Exhibit 1011 was published and accessible to the public on or shortly after June 20, 2018.

C. “Expanding the Imine Reductase Toolbox by Exploring the Bacterial Protein-Sequence Space” by Dennis Wetzl, Marco Berrera, Nicolas Sandon, Dan Fishlock, Martin Ebeling, Michael Miller, Steven Hanlon, Beat Wirz, and Hans Iding (“Wetzl”) [Exhibit 1009]

64. Exhibit 1009 is a copy of an article published in Volume 16, Issue 12 of the journal titled *ChemBioChem* found in the Linda Hall Library of Science, Engineering & Technology (Kansas City, Missouri). The article “Expanding the Imine Reductase Toolbox by Exploring the Bacterial Protein-Sequence Space” by Dennis Wetzl, Marco Berrera, Nicolas Sandon, Dan Fishlock, Martin Ebeling, Michael Miller, Steven Hanlon, Beat Wirz, and Hans Iding (hereafter “Wetzl”) appears beginning on page 1749 of this issue dated August 17, 2015. Exhibit 1009 is a true and correct copy of the Wetzl article (pages 1749-1756). I obtained this

copy of the article from the Linda Hall Library of Science, Engineering & Technology. Specifically, the text of the article is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1009 was found within the custody of a library – a place where, if authentic, a copy of this journal would likely be. Exhibit 1009 is a true and correct copy in a condition that creates no suspicion about its authenticity.

65. The Wetzl journal article is available from the Wiley Online Library,¹⁸ the digital repositories *ResearchGate*¹⁹ and *Europe PMC*.²⁰

66. Attached hereto as Attachment 3a is a true and correct copy of the MARC record for the journal titled *ChemBioChem* from the Linda Hall Library of Science, Engineering & Technology online catalog. The library ownership is indicated by the presence of the library's code (LHL) in field 049. I personally identified and retrieved the MARC record that is Attachment 3a.

67. Based on finding a print copy of Exhibit 1009 in the Linda Hall Library of Science, Engineering & Technology and MARC record in its online library

¹⁸ <https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/cbic.201500218>

¹⁹ https://www.researchgate.net/publication/277725157_Expanding_the_Imine_Reductase_Toolbox_by_Exploring_the_Bacterial_Protein-Sequence_Space

²⁰ <https://europepmc.org/article/med/26044455>

catalog attached as Attachment 3a, it is my opinion that the Wetzl article published in the journal titled *ChemBioChem* was publicly available on or shortly after September 23, 2015, as shown by the stamp on the cover. This date stamp has the general appearance of date stamps that libraries have long affixed to periodicals to show when an issue was received, verified, and checked.

68. As noted in the holdings information (field 362), the Linda Hall Library of Science, Engineering & Technology has received the journal titled *ChemBioChem* since July 2000 and continues to receive the publication. Field 310 of Attachment 3a reads “Monthly, \$b <2001-.” Accordingly, the MARC record for Exhibit 1009 corresponds to those issues of the journal titled *ChemBioChem* from the time of the serial began publication to the present day.

69. Attachment 3a further includes an entry in field 050 (“QD415.A1 \$b C54”)— includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 060 (“W1 \$bCH231”)— includes a subject matter classification number consistent with the National Library of Medicine classification system (analogous to the Dewey Decimal classification system). Attachment 3a further includes a descriptor term reading “Biochemistry \$v Periodicals” (see Attachment 3b, Library of Congress sh2007101985) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as

Attachment 3a was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 070 entry, and the field 650 entry. Further, as of September 21, 2000, the MARC record attached hereto as Attachment 3a was accessible through any library with access to the online catalog at the Linda Hall Library of Science, Engineering & Technology.

70. Attached hereto as Attachment 3c is a true and correct copy of the MARC record for the journal titled *ChemBioChem* obtained from the OCLC bibliographic database. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 3c, that library code is “RBN,” which means that the MARC record for this serial was cataloged at the Brown University Library Providence, Rhode Island). As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Brown University Library created OCLC record number 45055848 on September 21, 2000, as shown in the “Entered” field (“20000921”). The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 3c occurred on July 21, 2022, as shown in the “Replaced” field (“20220721”). I personally identified and retrieved the MARC record that is Attachment 3c.

71. The “BLvl” entry in Attachment 3c is “s,” which indicates that the journal titled *ChemBioChem* is a serial publication. Field 310 of Attachment 3c

reads “24 issues a year, \$b <2016-.” Accordingly, the MARC record for Exhibit 1009 corresponds to the journal titled *ChemBioChem* from the time the serial title began publication and includes the date of the Wetzl article.

72. Attachment 3c further includes an entry in field 050 (“QP501 \$b .C384”)— includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 060 (“W1 \$b CH231”)— includes a subject matter classification number consistent with the National Library of Medicine classification system (analogous to the Dewey Decimal classification system). Attachment 3c includes five descriptor terms reading “Biochemistry \$v Periodicals” (see Attachment 3b, Library of Congress sh2007101985), “Molecular biology \$v Periodicals” (see Attachment 3d, Library of Congress sh2008107896), “Pharmaceutical chemistry \$v Periodicals” (see Attachment 3e, Library of Congress sh2008109165), “Biochemistry” (see Attachment 3f, Library of Congress sh85014171), and “Chemistry” (see Attachment 3g, Library of Congress sh85022986) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 3c was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 060 entry, and the field 650 entries. As of September 21, 2000, the MARC record attached hereto as Attachment 3c was

accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

73. Attachment 3c indicates that the journal titled *ChemBioChem* as cataloged at the Brown University Library is currently available from 250 libraries. In view of the above, this issue of the journal titled *ChemBioChem* was publicly available on or shortly after September 23, 2015, because by that date it had been cataloged and indexed at the Brown University Library, made part of the OCLC bibliographic database, and received at the Linda Hall Library of Science, Engineering & Technology. For these reasons, it is my opinion that Exhibit 1009 was published and accessible to the public on or shortly after September 23, 2015.

VI. CONCLUSION

74. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

75. 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 Section 1001 of Title 18 of the United States Code.

Dated: January 9, 2023

Respectfully submitted,


Sylvia D. Hall-Ellis, Ph.D.

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015 |a GB8139531 |2 bnb
0220 |a 0262-2262 |2 02
040 |a Uk |b eng |c Uk |d Uk
042 |a issnuk |a ukblsr
043 |a e-uk---
05000 |a HD9652.5
08204 |a 338.476600941 |2 19
084 |a LT 00 |2 blsrisc
1300 |a Speciality chemicals (Redhill, England)
2100 |a Spec. chem. |b (Redhill)
222 0 |a Speciality chemicals |b (Redhill)
24510 |a Speciality chemicals : |b production, marketing and applications.
2461 |i Issues from Dec. 1999 have title: |a Speciality chemicals magazine
260 |a Redhill : |b Fuel & Metallurgical Journals, |c 1981-
26421 |a Redhill, Surrey : |b Quartz Chemicals Ltd
26421 |a St Albans, Hertfordshire : |b MackBrooks Speciality Publishing
26431 |a Hatfield, Herts, UK : |b TRMG Ltd
300 |a v. : |b ill. ; |c 30 cm.
310 |a Bimonthly
321 |a Monthly
336 |a text |2 rdacontent
337 |a unmediated |2 rdamedia
338 |a volume |2 rdacarrier
3620 |a Vol. 1, no. 1 (Feb.1981)-
500 |a From Vol. 28, no. 01 (Jan./Feb. 2008) also issued in a "digital ed." (turning the pages);
 from v. 29, no. 8 (Oct. 2009) alternate issues are in HTML format only at:
 http://www.specchemonline.com/scmo-intro.htm.
588 |a Latest issue consulted: March/April 2018.
595 |a FORMERLY 8404.902 UP TO VOL. 19(9), 1999 SEE ALSO 8404.902 FOR EXTERNAL
 HOLDINGS.
650 0 |a Chemical industry |z Great Britain |v Periodicals.
6907 |a Management and Business Studies |2 blcoll
945 |a Speciality chemicals magazine.
LKR |a PAR |b 011000279 |l BLL01 |r 787 |m Speciality chemicals (Redhill, England) |n
 Speciality chemicals
852 |a British Library |b DSC |j 8404.902500
866 0 |a Vol. 19, no. 10 (1999)-v. 30, no. 11 (2010)
85271 |a British Library |b STI |k (P) |h LT 00 |m -E(45) |2 blsrisc
866 0 |a Vol. 1, no. 1 (Feb. 1981)- ; Deficient: vol. 4, no. 1; vol. 11, no. 1, 4-6, 1991
SYS 010496426

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Labelled Display

LC control no.: sh 85022913

LCCN Permalink: <https://lcn.loc.gov/sh85022913>

HEADING: Chemical industry

000 00920cz a2200265n 450

001 4675408

005 20120322080758.0

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053 _0 |a HD9650 |b HD9663 |c Economics

053 _0 |a TP200 |b TP248 |c Technology

150 __ |a Chemical industry

450 __ |w nne |a Chemical industries

450 __ |w nne |a Chemicals |x Manufacture and industry

450 __ |a Man-made chemicals industry

450 __ |a Synthetic chemicals industry

550 __ |w g |a Industries

680 __ |i Here are entered works on industries that produce chemicals or are based on chemical processes. Works on individual chemical industries are entered under specific headings, e.g. |a Sulfuric acid industry.

906 __ |t 0731 |u te05 |v 0

953 __ |a xx00 |b ta25

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MARC Display

Labelled Display

LC control no.: sh 85056605

LCCN Permalink: <https://lcn.loc.gov/sh85056605>

HEADING: Great Britain

000 00898cz a2200169n 450

001 4708025

005 20110729110252.0

008 860211|| anannbabn |n ana

010 __ |a sh 85056605

035 __ |a (DLC)sh 85056605

035 __ |a (DLC)54710

040 __ |a DLC |c DLC |d DLC

151 __ |a Great Britain

680 __ |i Here are entered works on the United Kingdom of Great Britain and Northern Ireland, which comprises England, Northern Ireland, Scotland, and Wales, as well as works on the island of Great Britain. Works on the Republic of Ireland and on the island of the British Isles called Ireland are entered under |a Ireland. |i Works on the non-jurisdictional island group comprising the islands of Great Britain, Ireland, and smaller adjacent islands are entered under |a British Isles.

681 __ |i Notes under |a British Isles; Commonwealth of Nations; Ireland

906 __ |t 8621 |u fk01 |v 0

953 __ |a xx00 |b fj21

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LC control no.: sh 85099890

LCCN Permalink: <https://lcn.loc.gov/sh85099890>

HEADING: Periodicals

000 01324cz a2200337n 450

001 4749694

005 20120717060125.0

008 860211 | anannbabn |b ana

010 __ |a sh 85099890

035 __ |a (DLC)sh 85099890

035 __ |a (DLC)6226910

035 __ |a (DLC)sp 85099890

035 __ |a (DLC)314952

040 __ |a DLC |c DLC |d DLC

053 _0 |a AP |c General periodicals

053 _0 |a PN4700 |b PN5650 |c History

150 __ |a Periodicals

360 __ |i subdivision |a Periodicals |i under specific subjects, e.g. |a Engineering--Periodicals; United States--History--Periodicals

450 __ |a Journals (Periodicals)

450 __ |a Magazines

550 __ |w g |a Library materials

550 __ |w g |a Mass media

550 __ |w g |a Serial publications

550 __ |a Newspapers

550 __ |a Press

670 __ |a UMI business vocab. |b (Journals)

680 __ |i Here are entered works on the periodicals of the world and, with appropriate subdivisions, works on special aspects or sections of periodicals. Works on periodicals in a specific language, or in a specific country or larger area, are entered under the adjectival form of the language or area, e.g. |a Arabic periodicals; Canadian periodicals.

906 __ |t 0420 |u te03 |v 0

910 __ |a Proposal saved by tc03 on 05/14/2012 at 17:15:30

953 __ |a xx00 |b td14

906 __ |t 1206 |v 0

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 019 61195759
 022 0262-2262 \$l 0262-2262 \$2 z
 030 SPCHEY
 032 003101 \$b USPS
 042 nsdp
 090 \$b
 210 0 Spec. chem. \$b (Redhill)
 222 0 Specialty chemicals \$b (Redhill)
 245 00 Specialty chemicals.
 260 [Redhill, Surrey] : \$b [Fuel & Metallurgical Journals]
 310 Bimonthly, \$b <Aug. 1988-
 336 text \$b txt \$2 rdacontent
 337 unmediated \$b n \$2 rdamedia
 500 Published by: FMJ International Publications, <Aug. 1988-
 510 2 Chemical abstracts \$x 0009-2258
 588 Description based on surrogate of: Vol. 2, no. 1 (May 1982); title from cover.
 588 Latest issue consulted: Vol. 8, no. 4 (Aug. 1988).
 650 0 Chemical industry \$v Periodicals.
 650 7 Chemical industry. \$2 fast \$0 (OCoLC)fst00852951
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 785 00 \$t Specialty chemicals \$w (DLC) 00248268 \$w (OCoLC)44388723
 850 NvU \$a PBL

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035 __ |a (DLC)374886

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040 __ |a DLC |b eng |c DLC

150 __ |a Chemical industry |v Periodicals

667 __ |a Record generated for validation purposes.

670 __ |a Work cat.: Hua xue gong ye yu gong cheng =,

906 __ |t 8888 |u te00 |v 0

953 __ |a te00

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264 #1\$aWeinheim, Germany : \$bWiley-VCH, \$c[2009]-
310 ##\$aMonthly, \$b2010-<2015>
321 ##\$aFour issues per year, \$b2009
336 ##\$atext \$btxt \$2rdacontent
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338 ##\$aonline resource \$bcr \$2rdacarrier
362 1#\$aPrint began in 2009 with: 2009/1.
500 ##\$a"A journal of ChemPubSoc Europe."
520 ##\$aPrimary research papers and critical secondary
information on: heterogeneous catalysis, homogeneous catalysis,
biocatalysis, protein engineering, whole cell catalysis,
electrocatalysis, photocatalysis, organocatalysis, metal catalysis,
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catalytic processes, surface reactions, in situ techniques,
spectroscopic methods, theoretical methods, catalyst preparation,

ATTACHMENT 2a

catalyst characterization, practical applications, and catalytic mechanisms.

588 0#\$aVol. 6, no. 1 (January 2014); title from PDF cover
(Library of Congress eDeposit archive, viewed January 27, 2015).

588 1#\$aVo. 7, no. 1 (January 2015) (Wiley Online Library, viewed
January 27, 2015).

500 ##\$aRefereed/Peer-reviewed

650 #0\$aCatalysis \$vPeriodicals.

650 12\$aCatalysis

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655 #2\$aPeriodical

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655 #7\$aPeriodicals. \$2lcgft

710 2#\$aChemPubSoc Europe, \$eissuing body.

776 ##\$x1867-3880

906 ##\$aJOURNAL

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260 Weinheim, Germany : \$b Wiley-VCH

310 Monthly, \$b 2010-

321 Four times a year, \$b 2009

336 text \$b txt \$2 rdacontent

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362 1 Began with 2009/1.

500 "A journal of ChemPubSoc Europe."

588 0 2009/1; title from cover.

588 1 Vol. 1, no. 2 (Oct. 2009).

650 0 Catalysis \$v Periodicals.

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710 2 ChemPubSoc Europe, \$e issuing body.
776 08 \$i Online version: \$t ChemCatChem \$x 1867-3899 \$w (DLC) 2011250759 \$w (OCOLC)430222404
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856 41 \$u [http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1867-3899](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1867-3899)
856 41 \$u <http://www3.interscience.wiley.com/journal/122208635/home>
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246 30$aEuropean journal of chemical biology
246 30$aChemical biology
246 3#$aChem bio chem
260 ##$aWeinheim, Germany : $bWiley-VCH Verlag, $cc2000-
300 ##$av. : $bill. ; $c28 cm.
310 ##$aMonthly, $b2001-
321 ##$aFour no. a year, $b2000
362 0#$aVol. 1, no. 1 (July 3, 2000)-
500 ##$aFor v.1, no.1(Jl. 2000)-2, no.7(Ag 2001), see Angewandte
chemie. International edition in English.
500 ##$aTitle from cover.
530 ##$aAlso available by subscription via the World Wide Web.
580 ##$aCompanion journal to: Chemistry (Weinheim an der
Bergstrasse, Germany)
580 ##$aPublished in conjunction with Angewandte Chemie
(International ed. in English) and distributed to its subscribers,
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650 #0$aBiochemistry $vPeriodicals
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936 ##$aVol. 2, no. 1 (Jan. 8, 2001) LIC
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210 10 Chembiochem \$2 dnIm

245 00 Chembiochem : \$b a European journal of chemical biology.

246 3 Chem bio chem

246 30 European journal of chemical biology

246 30 Chemical biology

246 13 Chemical biology & biological chemistry \$f <Aug. 3, 2000-

260 Weinheim, Germany : \$b Wiley-VCH, \$c ©2000-

300 volumes : \$b illustrations (some color) ; \$c 28 cm

310 24 issues a year, \$b 2016-

321 Four no. a year, \$b 2000

321 Monthly, \$b 2001-2007

321 18 issues a year, \$b 2008-2015

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

362 0 Vol. 1, no. 1 (July 3, 2000)-

500 Title from cover.

515 Issues for <Jan. 8, 2001- also called <2001/1-

ATTACHMENT 3c

515 Some no. combined.

550 Issued by: EU ChemSoc, GÖCH, SRC, KVCV, CSCH, SFC, GDCh, Association of Greek Chemists, MKE, SCI, KNCV, PTCh, Sociedade Portuguesa de Química, Real Sociedad Española de Química, Svenska Kemistsamfundet, <2006-

580 Companion publication to: Chemistry (Weinheim an der Bergstrasse, Germany).

580 Published in conjunction with: Angewandte Chemie (International ed. in English).

588 1 Vol. 9, no. 18 (December 15, 2008).

650 0 Biochemistry \$v Periodicals.

650 0 Molecular biology \$v Periodicals.

650 0 Pharmaceutical chemistry \$v Periodicals.

650 0 Biochemistry.

650 0 Chemistry.

650 12 Biochemistry \$0 (DNLM)D001671

650 22 Chemistry \$0 (DNLM)D002621

650 6 Biochimie \$0 (CaQQLa)201-0001077 \$v Périodiques. \$0 (CaQQLa)201-0378307

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650 7 biochemistry. \$2 aat \$0 (CStmoGRI)aat300054538

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655 7 Zeitschrift. \$2 swd

710 2 EU ChemSoc.

710 2 Gesellschaft Österreichischer Chemiker.

710 2 Société royale de chimie (Belgium)

710 2 Koninklijke Vlaamse Chemische Vereniging.

710 2 Česká společnost chemická.

710 2 Société française de chimie.

710 2 Gesellschaft Deutscher Chemiker.

710 2 Henōsis Hellēnōn Chēmikōn.

710 2 Magyar Kémikusok Egyesülete.

710 2 Società chimica italiana.

710 2 Koninklijke Nederlandse Chemische Vereniging.

710 2 Polskie Towarzystwo Chemiczne.

710 2 Sociedade Portuguesa de Química.

710 2 Real Sociedad Española de Química.

710 2 Svenska kemistsamfundet.

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730 0 Chemistry (Weinheim an der Bergstrasse, Germany)

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856 41 Wiley InterScience \$u <http://www3.interscience.wiley.com/cgi-bin/jhome/72510898>

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053 _0 |a QH345 |c Biology

053 _0 |a QP501 |b QP801 |c Physiology

150 __ |a Biochemistry

360 __ |i subdivision |a Composition |i under individual animals and groups of animals, e.g.
|a Fishes--Composition; Cattle--Composition

450 __ |w nne |a Biological chemistry

450 __ |a Chemical composition of organisms

450 __ |a Organisms |x Composition

450 __ |w nne |a Physiological chemistry

550 __ |w g |a Biology

550 __ |w g |a Chemistry

550 __ |w g |a Medical sciences

670 __ |a MeSH browser, July 29, 2020 |b (Biochemistry. SN The study of the composition, chemical structures, and chemical reactions of living things. In MeSH Tree Structures under Biological Science Disciplines and under Chemistry)

670 __ |a Web. 3.

670 __ |a Hennepin.

670 __ |a McGraw-Hill dict. of sci. and tech. terms, c2003 |b (biochemistry [CHEM] The study of chemical substances occurring in living organisms and the reactions and methods for identifying these substances)

670 __ |a Tröjbom, M. Chemistry data from surface ecosystems in Forsmark and Laxemar-Simpevarp, 2010: |b p. 3 ("chemical composition of the regolith and biota of the terrestrial, limnic, and marine ecosystems")

ATTACHMENT 3f

- 670 __ |a Biology dictionary, via WWW, July 29, 2020 |b (Chemical Biology: a scientific discipline that combines chemistry and biology by using chemistry and chemical techniques to study biological systems. The main difference between chemical biology and biochemistry is that chemical biology involves adding novel chemical compounds to a biological system, while biochemistry is the study of chemical reactions that naturally happen inside organisms. Examples of chemical biology research include controlling cell division and other cell activities, using small molecules as targets for treatment, and manipulating stem cells. Differences between chemical biology and biochemistry: Chemical biology adds chemical compounds to biological systems in order to see what effect these chemicals have on cells and tissues. Chemical biologists often synthesize and add new compounds to cells. The goal of chemical biology research is to develop techniques that can eventually be applied to cells in a living organism, such as treatment options for cancer and other diseases. Biochemistry, on the other hand, is all about the chemical processes that already occur naturally in the cell. Instead of adding chemical compounds to cells to see the effects, biochemistry researchers study the chemical reactions that occur in organisms and the molecular makeup of these compounds. Biochemists also tend to study larger molecules like proteins and nucleic acids, while chemical biologists study smaller molecules) |u https://biologydictionary.net/chemical-biology/
- 680 __ |i Here are entered works on the study of naturally occurring chemical reactions in organisms. Works on the use of chemistry and chemical techniques to study biological systems are entered under |a Chemical biology.
- 681 __ |i Note under |a Chemical biology
- 910 __ |a Proposal saved by tc03 on 07/31/2020 at 10:12:44
- 952 __ |a Made for existing bibliographic records
- 952 __ |a LC pattern: Biophysics
- 906 __ |t 1125 |v 0
- 906 __ |t 2009 |v 0

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