
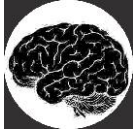


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|  | <p align="center">SKILLS CENTER STANDARD OPERATING PROCEDURE</p> | <p align="center">A BIOFIZZ  PRODUCTON</p> |
| <p align="center">Searching the Patent Literature 2 Module Hours</p> | <p align="center">Effective Date: 3/15/2020 Checked by A. Siclair</p> | <p align="center">Revision # 1.0 M. Guzie</p> |


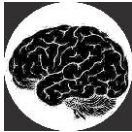
BACKGROUND

In the age of biotechnology, not only are new discoveries emerging constantly but also new methodologies and ways to conduct research to build on and better the already-known methods. As biologists develop new methodologies, systems, or products, they may want to patent the technology to ensure that they can financially benefit from their development. For a biologist to be granted a patent, their invention must be novel, adequately described, and useful for the biologic purpose that it is meant to serve; the inventor or inventor group must submit a patent application detailing the purpose and use of their product, what it completely entails, and what intellectual or physical property entirely will be considered theirs under the patent. Once a biologist has received a patent on their product, they are legally allowed to exclude others from the development, use, or sale of their product for a certain amount of time. When many scientists develop a technique or product together, or even multiple different research labs come together in a development, they must apply for a joint patent together (Latimer, 2004).

A variety of materials and methods that arise from biological research can be eligible for patents. This includes methods/kits used for nucleic acid (DNA and RNA) isolation or protein isolation, the isolation of other types of biological macromolecules, methods or tools to manipulate/manufacture nucleic acids or proteins, diagnostic kits, chemical testing kits, microarrays, pharmaceuticals, bioinformatic software, and techniques to develop or synthesize certain medicines or food products in a more efficient manner (Latimer, 2004).

It is therefore important for the modern biologist to be able to access patented information to see research that may be similar to their own and avoid patent prosecution. The patent literature may also include more specificity of experimental design, methodology, and results than found in the regular literature. Biologists can also find whether a patent has expired yet, indicating whether or not they could use that product or methodology. It is therefore necessary for biologists working on research especially involved in the use or development of new, novel techniques to be aware of the patent literature and how to search through it.

This module will describe the general ways to search through patent literature and find specific data. There are several different product-specific websites to browse through patented data, such as pharmaceutical companies and biotechnology companies, but this module will describe the use of the overarching search tool Google Patents. Google patents contains US (United States), EPO (European Patent Office), and WIPO (World Intellectual Property Organization) patent documents (University of Ottawa, n.d.)

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1. PURPOSE

The purpose of this procedure is to recognize the importance of patent literature in modern biology, how to search for it, and utilize the information.

2. SCOPE



This procedure applies to qualified skills center users.

3. RESPONSIBILITY

- 3.1. It is the responsibility of the user to understand and perform the procedure described in this document.
- 3.2. It is the responsibility of the user performing the procedure to fully document any deviations from the written procedure.
- 3.3. It is the responsibility of the user to become trained in the use of this application.

4. DEFINITIONS

- 4.1. Patent: An exclusive right granted for an invention or idea which allows the inventor to claim ownership of the product for financial, distributive, and informative reasons.
- 4.2. Patent Inventor: The person or group which created the patentable product as a work of their own.
- 4.3. Patent Assignee: The entity (such as a group or company) that owns the patent and has property right. The assignee can be the same as the inventor, but in most cases, if the inventor is an employee, they will make the assignee the company for which they work.
- 4.4. Patent Office: A governmental organization which controls the issuance of patents; they may grant a patent or reject the patent application.
- 4.5. Patent Litigation: The process which occurs when the assignee of a patent takes legal action against someone for the illegal manufacture, use, or sale of their patent.
- 4.6. Boolean Search: A method of inputting information using the words AND, OR, NOT and others to connect strings of information in specific ways to narrow, expand, or specify the search.
- 4.7. Prior Art: Already existing public information that may be used to compare or challenge the validity of an existing patent. For example, prior art for a patent granted on January 1st, 2020, will include all similar works which can be used to comparatively assess the validity and intellectual integrity of the patent.

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5. MATERIALS/EQUIPMENT

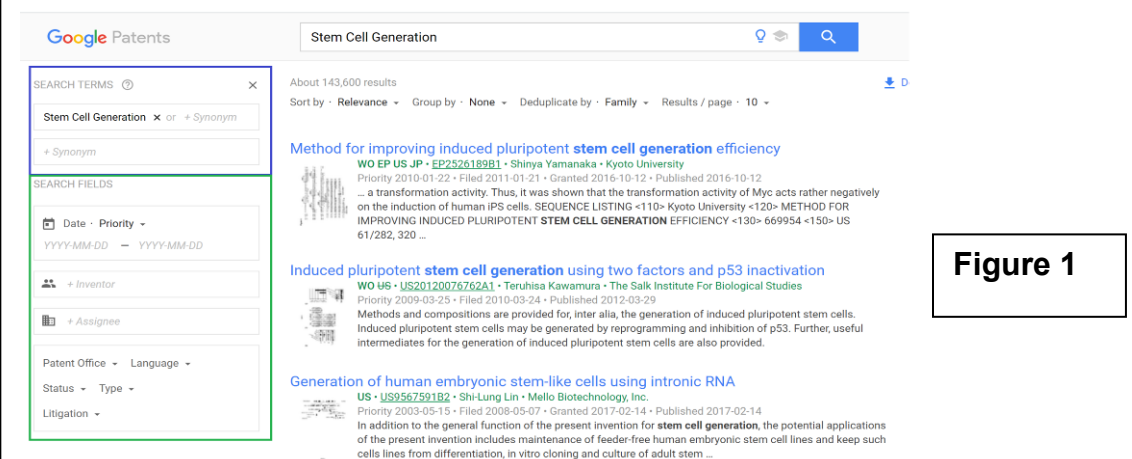
- 5.1. A computer to perform the procedure.
- 5.2. Google Patents: <https://patents.google.com/>.

6. PROCEDURE

In this procedure, the methods of using Google Patents to search for available patent literature will be described, as well as what useful information can be found from the resulting literature.

6.1. Using Google Patents



- 6.1.1. Go to the Google Patents site at <https://patents.google.com/>.
- 6.1.2. In general, when conducting a patent search, use keywords to describe the invention that is being searched. Think about the use, structure, and components of the invention/process. Brainstorm the keywords and type them into the search bar and select the search icon. Patents can also be searched directly by patent publication number if a specific patent is already in mind.
- 6.1.3. Additional **search terms** (synonyms) can be added to make the search more specific. The **search fields** can also be specified by including dates, inventors, and assignees. The patent office, language, status, type, and litigation can all also be specified (see DEFINITIONS.) Select grant for “status” and patent for “type” so the search is narrowed to only patents which have been successfully granted, and discludes any patent applications. The search field can be narrowed in many more ways, as listed above, but these two settings will narrow the search to just accepted patents. (**Figure 1**)



The screenshot shows the Google Patents search interface. The search bar contains 'Stem Cell Generation'. The results page shows 'About 143,600 results'. The first result is 'Method for improving induced pluripotent stem cell generation efficiency' with patent number WO EP US JP · EP2526189B1. The second result is 'Induced pluripotent stem cell generation using two factors and p53 inactivation' with patent number WO US · US20120076762A1. The third result is 'Generation of human embryonic stem-like cells using intronic RNA' with patent number US · US9567591B2. On the left side, there are search filters for 'SEARCH TERMS' (Stem Cell Generation or + Synonym), 'SEARCH FIELDS' (Date, Priority, Inventor, Assignee, Patent Office, Language, Status, Type, Litigation), and 'About 143,600 results'.

Figure 1



Figure 1: A search done for stem cell generation could be useful to a scientist working in a lab developing their own stem cell generation techniques.

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| Searching the Patent Literature 2 Module Hours | Effective Date: 3/15/2020 Checked by A. Siclair | Revision # 1.0 M. Guzie |

- 6.1.4. Now that the search field has been narrowed to accepted patents, select a patent relating the most to the desired literature.
- 6.1.5. The patent page will be displayed. This page displays all the relevant information of the patent. On the right, the **patent publication code** is displayed along with what patent database which google utilizes that the patent was extracted from (here, the EPO or **European Patent Office**.) The EP at the beginning of the code indicates that this patent originates from the EPO. The patent can be **downloaded as a PDF**. The **Find Prior Art** option will bring up existing patents which have similar ideas using keywords from the selected patent. The **status** of the patent will also be displayed, showing whether it is active or expired (and when the **anticipated expiration** is). (**Figure 2**)

Google Patents

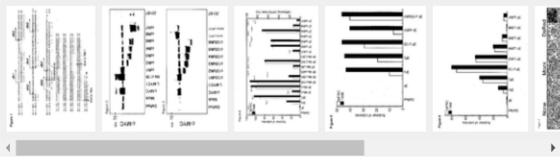
(Stem Cell Generation) status:GRANT language:ENGLISH type:PATENT

← Back to results Stem Cell Generation; Status: GRANT; Type: PATENT; Language: ENGLISH;

Method for improving induced pluripotent stem cell generation efficiency

Images (9)






Classifications

■ **C07K14/435** Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof from animals; from humans

[View 7 more classifications](#)

EP2526189B1
European Patent Office

 Download PDF
 Find Prior Art
 Similar


Other languages: [German](#), [French](#)

Inventor: [Shinya Yamanaka](#), [Masato Nakagawa](#)

Current Assignee: [Kyoto University](#)

Worldwide applications

2011 · [JP](#) [WO](#) [EP](#) [US](#)

Application EP11734826.8A events 

2010-01-22 · Priority to US28232010P

2011-01-21 · Application filed by Kyoto University

2011-01-21 · Priority to PCT/JP2011/051685

2012-11-28 · Publication of EP2526189A1

2014-03-19 · Publication of EP2526189A4

2016-10-12 · Application granted



2016-10-12 · Publication of EP2526189B1

Status ● Active

2031-01-21 · Anticipated expiration

Figure 2

Figure 2: A patent from the EPO describing methodology for induced pluripotent stem cell generation.

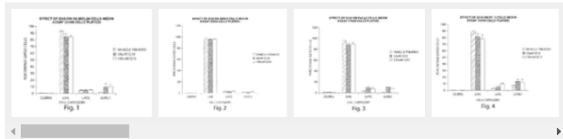
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| Searching the Patent Literature 2 Module Hours | Effective Date: 3/15/2020 Checked by A. Siclair | Revision # 1.0 M. Guzie |

The status of the patent may be active (patent granted), pending (patent application awaiting approval), or **abandoned** (patent application withdrawn or suspended so it will not become a granted patent.) Note that some patents also have a drop-down **show all events** selection that will give a timeline of the patents application and assignment process. This feature is not available for all patents. (**Figure 3**)

Methods for the diagnosis of oncological disorders using epimetabolic shifters, multidimensional intracellular molecules, or environmental influencers

Abstract
Methods and formulations for diagnosing oncological disorders in humans using epimetabolic shifters, multidimensional intracellular molecules or environmental influencers are described.

Images (25)



Classifications

- A61K31/00 Medicinal preparations containing organic active ingredients

View 37 more classifications

US20160145693A1
United States

Download PDF Find Prior Art Similar

Inventor: Niven Rajin Narain, John Patrick McCook, Rangaprasad Sarangarajan
Current Assignee: BERG LLC

Worldwide applications

2010 · SG KR SG JP US BN EA SG EA MX SG EP CN WO JP US WO CN GN GA JP MX GA SG MX EP AU SG BR EP WO US CN MX KR KR AU EP KR KR BR US SG KR BR GA SG EA MX CN EP MX CN JP BR WO CA GA SG AU AU US JP KR BR EA EA AU 2011 · IL IL IL IL IL 2014 · US 2015 · JP JP JP US 2016 · US AU AU AU JP JP AU 2017 · JP JP JP US US 2018 · US 2019 · US 2020 · US

Application US14/940,614 events

2009-05-11 · Priority to US17724109P
2009-05-11 · Priority to US17724309P
2009-05-11 · Priority to US17724409P
2009-05-11 · Priority to US17724509P
2009-05-11 · Priority to US17724609P
2010-05-11 · Priority to US12/778,029
2015-11-13 · Priority to US14/940,614
2015-11-13 · Application filed by BERG LLC
2016-01-20 · Assigned to CYTOTECH LABS, LLC
2016-01-20 · Assigned to BERG BIOSYSTEMS, LLC
2016-01-20 · Assigned to BERG PHARMA LLC
2016-01-20 · Assigned to BERG LLC
2016-05-26 · Publication of US20160145693A1

Status · Abandoned
Show all events

Figure 3

Figure 3: A US patent involving oncological diagnostic methodology using metabolic and environmental factors which has been abandoned.

6.1.6. If the show all events drop-down is available for the selected patent, select it and view the history of the patent. This will include dates the application was **filed** and dated which the patent was **assigned/reassigned** (see DEFINITIONS) to different owners. (**Figure 4**)


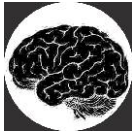
Figure 4: The chronological application filing and patent assignment dates for US Patent US20160145693A1.

Application US14/940,614 events

- 2009-05-11 · Priority to US17724109P
- 2009-05-11 · Priority to US17724309P
- 2009-05-11 · Priority to US17724409P
- 2009-05-11 · Priority to US17724509P
- 2009-05-11 · Priority to US17724609P
- 2010-05-11 · Priority to US12/778,029
- 2015-11-13 · Priority to US14/940,614
- 2015-11-13 · Application filed by BERG LLC**
- 2016-01-20 · Assigned to CYTOTECH LABS, LLC
- 2016-01-20 · Assigned to BERG BIOSYSTEMS, LLC
- 2016-01-20 · Assigned to BERG PHARMA LLC
- 2016-01-20 · Assigned to BERG LLC
- 2016-05-26 · Publication of US20160145693A1**


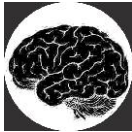
Status · Abandoned
Hide events

Figure 4

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| <p style="text-align: center;">Searching the Patent Literature</p> <p style="text-align: center;">2 Module Hours</p> | <p style="text-align: center;">Effective Date: 3/15/2020</p> <p style="text-align: center;">Checked by A. Siclair</p> | <p style="text-align: center;">Revision # 1.0</p> <p style="text-align: center;">M. Guzie</p> |

6.1.7. Scroll down through the rest of the page to review all the detailed information of the patent. This includes the background of the invention and detailed methodology and experimental results of the invention that may not be found in normal primary literature. Some key sections include:

- Abstract** gives a short summary of the overall purpose and use of the patent.
- Images** provide key figures and graphical representations which go along with experimental results.
- Classifications** is used to categorize the patent based on fields of use that it could apply to or specific processes or elements involved. For example, biological patents may be classified according to proteins or other molecules they involve.
- Description** gives a general overview of the claim of the patent, what it includes, and the general background and function of the product.
- Summary of the Invention** gives a general summary of the key features and points of the invention/product.
- Brief Description of The Drawings** acts as a figure legend, giving a description of each of the images.
- Detailed Description of The Invention** gives an explicit overview of the features of the invention describing experimental results and evidence to support the use and efficiency of the patent.
- Patent Citations** includes citations of any other patents used in the patent.
- Non-Patent Citations** includes citations of other, non-patented resources and materials used in the patent.
- Cited By** lists other patents which cited the patent of interest.
- Similar Documents** includes patents or literature discussing similar materials or processes.
- Priority and Related Applications** include the applications of the patent and when they were filed, including the priority applications, or the first accepted filing applications of the patent. The priority date is the filing date of the first accepted application, and it is used to determine if another patent or document qualifies as prior art against the patent (Tobin, 2019).
- Legal Events** includes the events that occurred during the process of patenting; including application, assignments, grants, etc.
- Concepts** includes a separated list of all the individual key ideas included in the patent. For example, in biological patents, all different molecules/biological processes will be noted separately.
- Claims** defines the intellectual and inventive property of the patent, describing in detail the products and processes which the patent encompasses under the granted patent application.

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| Searching the Patent Literature 2 Module Hours | Effective Date: 3/15/2020 Checked by A. Siclair | Revision # 1.0 M. Guzie |

6.1.8. Return to the home page to experiment with the use of the Boolean search operators. These are the words which can be typed directly into the search bar and used to hold together keywords in certain ways so that the search engine understands how to run the search. **(Figure 5)**

-The use of **AND** will search a set of words which include every word adjacent to the ANDs.

-The use of **OR** will search a set of words which include at least one of the words adjacent to the ORs.

-The use of **NOT** will eliminate any sets of words which contain the keyword following the NOT operator.



-The use of an **asterisk (*)** will search sets of words which include different forms of a root word. For example, gluc* will search for all words which begin with gluc, like glucose, glucosamine, glucagon, etc.

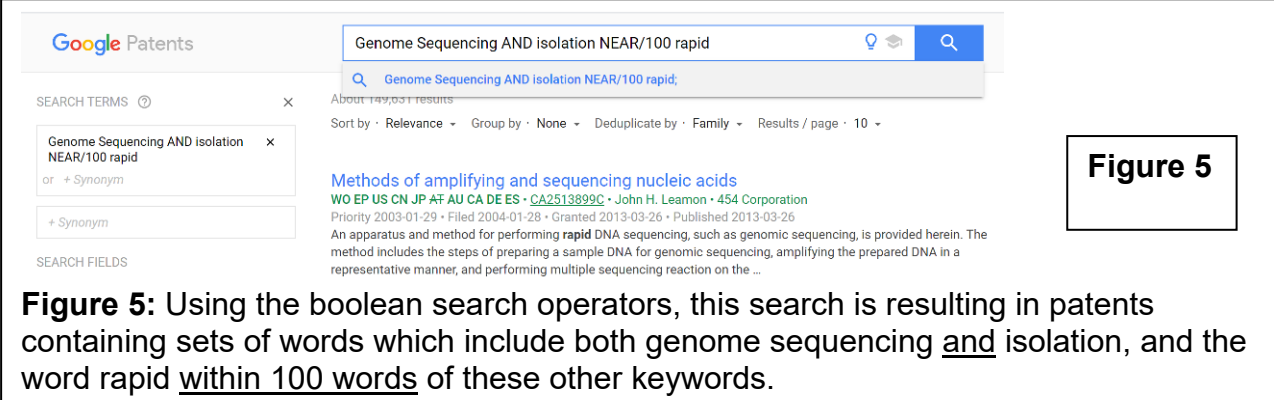
-The use of **-** will remove a certain word following the minus sign from the search results and only include the words before. For example, searching for ((Immunohistochemistry)-(mouse)) would search for immunohistochemistry results which do not include the word mouse at all in the patent. This functions the same as the NOT operator.

-The use of **NEAR** will search for a set of words based on proximity; documents with the specified proximity will result in a higher score and bring that patent higher in the search results. The user can use NEAR, NEARx, or NEAR/x where the x can be used to indicate the maximum distance of how far away the two words adjacent to the NEAR function will be. For example, ((Protein Isolation)NEAR/10(cytoplasmic)) will bring patents containing the keywords protein isolation within 10 words of the word cytoplasmic to the top of the search.

-The use of **WITH** will search for a set of words also based on proximity as does the NEAR operator; searches for the adjacent terms within 20 words.

-The use of **SAME** will search for a set of words also based on proximity as does the NEAR and WITH operators; searches for the adjacent terms within 200 words. (GreyB, 2020).

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| Searching the Patent Literature 2 Module Hours | Effective Date: 3/15/2020 Checked by A. Siclair | Revision # 1.0 M. Guzie |



The screenshot shows a Google Patents search interface. The search bar contains the query "Genome Sequencing AND isolation NEAR/100 rapid". The search results page displays a patent entry titled "Methods of amplifying and sequencing nucleic acids" with the number WO EP US CN JP AF AU CA DE ES · CA2513899C. The abstract snippet reads: "An apparatus and method for performing rapid DNA sequencing, such as genomic sequencing, is provided herein. The method includes the steps of preparing a sample DNA for genomic sequencing, amplifying the prepared DNA in a representative manner, and performing multiple sequencing reaction on the ...".

Figure 5


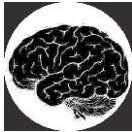
Figure 5: Using the boolean search operators, this search is resulting in patents containing sets of words which include both genome sequencing and isolation, and the word rapid within 100 words of these other keywords.

7. TROUBLE SHOOTING

7.1. If the Boolean operator search results are not yielding the information wanted, remember that the Boolean search method will search for the terms ANYWHERE in the patent, not just in the title, abstract, or description. It may yield a great number of results which don't seem as specific as thought. This is why Boolean operator use can be so useful, as many Boolean operators can be used with many different terms to further narrow the search. Further narrow your search by adding more terms of specificity, keeping in mind it will search through the entire patent.

8. REFERENCES

- GreyB. (2020, August 22). *Google patents search - a definitive guide by greyb*. Greyb. Retrieved from <https://www.greyb.com/google-patents-search-guide/>.
- Latimer, M. T. (2004). *Patenting inventions arising from biological research*. National Center for Biotechnology. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC549056/>.
- Tobin, W. (2019, December 6). *Patent Priority Dates Must be a Priority!* JD Supra. Retrieved from [https://www.jdsupra.com/legalnews/patent-priority-dates-must-be-a-priority-37753/#:~:text=The%20priority%20date%20is%20the,application%20\(the%20priority%20chain\).](https://www.jdsupra.com/legalnews/patent-priority-dates-must-be-a-priority-37753/#:~:text=The%20priority%20date%20is%20the,application%20(the%20priority%20chain).)
- University of Ottawa. *RESEARCH guides: Biology: Find patents*. University of Ottawa Library. (n.d.). Retrieved from <https://uottawa.libguides.com/c.php?g=265086&p=5131526>

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9. MODULE MASTERY TASK

Use Google Patents to search through patent literature and extract important information from the patents.

9.1. You are a scientist in a research lab interested in the impact of pharmacological compounds derived from the essential oils such as lavender, eucalyptus, chamomile, and rose. You are trying to harvest large amounts of these chemicals from their respective plants in the most efficient manner. Conduct a patent search about the extraction of these materials. Find the most useful patent(s) about the extraction of these materials and make a record of it/them.

-Write at least 3 pieces of important information which can be taken from this patent(s) that could help or hinder your extraction studies (i.e. what are the claims of this patent? Key inventions?)

-Is this patent past its expiration so you may use the methodologies for your own extraction processes? If not, continue your search until you find a patent that could be useful to your extraction process that is no longer active. The "Find Prior Art" function may help you find similar literature which is older and has expired.


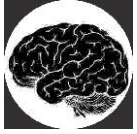
9.2. You are a scientist in a lab studying both cell division (cell birth) and apoptosis (cell death.) You are interested in factors which can trigger both these processes and possible therapeutics in diseases involving disfunctions in these pathways. Search the patent literature for information on methods used to trigger these cellular processes. You may need to identify two different patents, one for each process.

-For each process, write at least 3 pieces of important information which can be taken from these patents that could help or hinder your studies (i.e. what are the claims of this patent? Key inventions?)

-Are any important compounds identified that can be used in your studies to trigger these processes?

-Are any of these patents past their expiration so you may use these methodologies for your own studies? If not, continue your search until you find patents that could be useful to your studies that are no longer active. The "Find Prior Art" function may help you find similar literature which is older and has expired.

9.3. You are working on a developing a technique of intracellular delivery of functional proteasomes as a possible cure to those inflicted by diseases of dysfunctional proteasomes. The mechanisms you have been studying are related to receptor-dependent endocytic vesicle fusion and clathrin coat formation. Using at least 3 keywords and 2 Boolean operators, search for literature to check your developing

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method against. Select a patent found using this method and make note of what was typed into the search bar to find it using the Boolean operators.