

如何通过信息学策略， 跟上最新的研究进展？

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北京大学医学部

概要

一、文献海洋中，如何开展精准查询法和引文跟踪法？

几个习惯都要有：

- 浏览 vs. 查询；
- 被动接收 vs. 主动检索；
- 文档查询 vs. 文本挖掘

二、大数据时代，如何开展全域信息获取？

- 超越文献，定位前端的基金资助、后端的专利技术等。

- 精准查询法

- site: gov.cn
- intitle:
- filetype:

- 浏览法

- 定制领域权威期刊
- 每期自动发送
- 交叉性启发

- 引文跟踪法

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 Google 学术搜索... [收件箱] Zhiyong Lu - 新的相关研究工作

更早 (47)

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Google Scholar Al... [收件箱] 1 new citation to articles by Halil Kilicoglu

 Google 学术搜索... [收件箱] Zhiyong Lu - 新文章

Google Scholar ア... [收件箱] Iana Atanassova さんの論文からの引用: 1 件

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中央网信办、发展改革委、工业和信息化部联合印发 《公共信息资源开放试点工作方案》（2018）

5 / 9 | - 156% + | ☰ ☳

（三）提高数据质量

试点地区要优先开放民生紧密相关、社会迫切需要、商业增值潜力显著的高价值数据，并提高开放数据的质量，提升数据的完整性、准确性、有效性、时效性。试点地区要研究制定公共信息资源开放技术规范，明确开放数据的完整性、机器可读性、格式通用性等要求。可下载的数据集应采用可机器读取格式（如 CSV、JSON、XML、XLS 等）开放，可机读率不低于 90%，鼓励优先采用 CSV 格式。提高实时动态数据开放比重。立足便捷获取和开发利用，可用 API 接口下载的数据集占开放数据集总量的比例不低于 30%。研究建立公共信息资源开放的质量管理体系，明确各单位数据采集、发布、维护的质量规范和责任。加强开放数据的审核和更新，确保数据的准确性和时效性。建立社会参与公共信息



公共信息资源开放试点工作方案 site:cac.gov.cn



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2018年1月5日 近日,为贯彻落实党中央、国务院关于推进公共信息资源开放的有关工作部署,中央网信办、发展改革委、工业和信息化部联合印发《[公共信息资源开放试点工作方案](#)

中华人民共和国国家互联网信息办公室 百度快照

[举旗定向行动指南-中共中央网络安全和信息化委员会办公室](#)



2018年11月6日 为贯彻落实党中央、国务院关于推进公共信息资源开放的有关工作部署,中央网信办、发展改革委、工业和信息化部联合印发《[公共信息资源开放试点工作方案](#)

中华人民共和国国家互联网信息办公室 百度快照

[2017盘点十大网信关键词](#)

5 中央网信办等三部门联合开展[公共信息资源开放试点工作](#) 2018年1月上旬,为贯彻落实党中央、国务院关于 推进公共信息资源开放的有关工作部署,中央网信办,发展改革委,工业和信...

中华人民共和国国家互联网信息办公室 百度快照

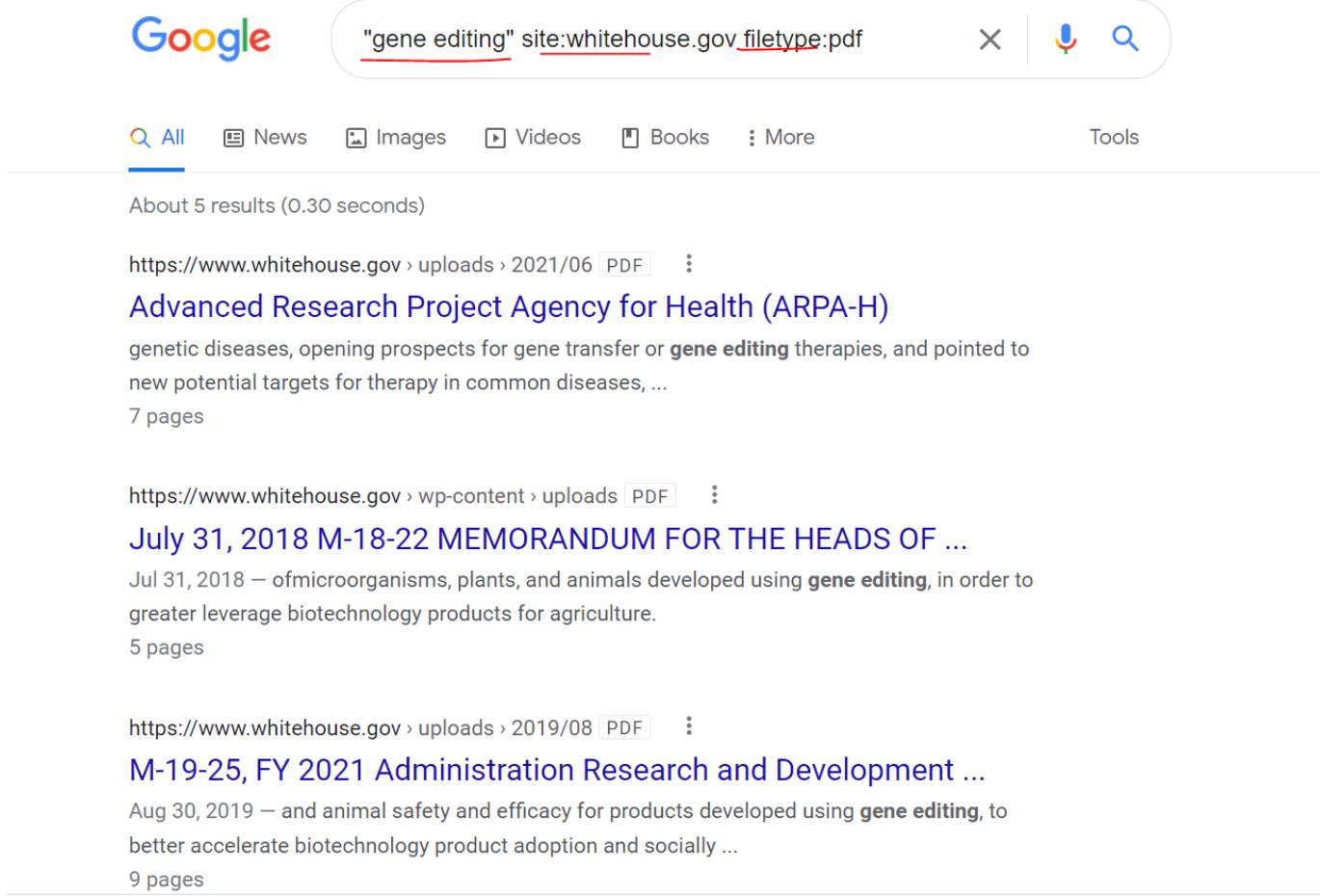
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搜索引擎精准获取：权威机构发布的报告

- "gene editing" site:whitehouse.gov filetype:pdf



A screenshot of a Google search results page. The search query is "gene editing" site:whitehouse.gov filetype:pdf. The results show three PDF documents from the White House:

- Advanced Research Project Agency for Health (ARPA-H)**
genetic diseases, opening prospects for gene transfer or gene editing therapies, and pointed to new potential targets for therapy in common diseases, ...
7 pages
- July 31, 2018 M-18-22 MEMORANDUM FOR THE HEADS OF ...**
Jul 31, 2018 – of microorganisms, plants, and animals developed using gene editing, in order to greater leverage biotechnology products for agriculture.
5 pages
- M-19-25, FY 2021 Administration Research and Development ...**
Aug 30, 2019 – and animal safety and efficacy for products developed using gene editing, to better accelerate biotechnology product adoption and socially ...
9 pages

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The screenshot shows the PubMed.gov homepage with a dark blue background featuring a network of nodes and connections. In the top left corner, the NIH logo and "National Library of Medicine" text are visible, followed by "National Center for Biotechnology Information". The "PubMed.gov" logo is prominently displayed. A red horizontal bar spans across the middle of the page. Below this bar, the text "Advanced" is on the left, and a descriptive paragraph about PubMed is on the right. On the far right, a white "ACCOUNT" dropdown menu is open, containing the following items: "Logged in as: dujian" (which is circled in red), "Dashboard", "Publications", "Account settings", and "Log out".

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PubMed® comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

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Search : PubMed

Hint: clicking the "Search" button without any terms will search the database's homepage.

Your PubMed search

Name of saved search: semrep[tiab] OR SemMedDB[tiab] X**Search terms:** semrep[tiab] OR SemMedDB[tiab] OR "Semantic Medline"[tiab] OR "Knowledge Graph"[ti][Test search terms](#)**Would you like e-mail updates of new search results?**

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E-mail: windowsdujian@163.com ([change](#))**Schedule:**Frequency: Daily**Formats:**Report format: Abstract**Number of items:**Send at most: 20 items Send even when there aren't any new results**Any text you want to be added at the top of your e-mail (optional):**Save

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<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	8月20日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月31日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月24日
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<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月20日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月19日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月13日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月9日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月3日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	7月2日
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<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	3月20日
<input type="checkbox"/>	My NCBI	 [收件箱] What's new for 'semrep[tiab] OR SemMedDB[tiab]' in PubMed	3月6日
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例：青蒿素获诺奖的若干早期线索

Nobel Prizes and Laureates

Medicine Prizes ▾ 2015 < >

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[Prize Announcement](#)
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Award Ceremony Video
Award Ceremony Speech

► William C. Campbell
► Satoshi Ōmura
► Youyou Tu

All Nobel Prizes in Physiology or Medicine
All Nobel Prizes in 2015

The Nobel Prize in Physiology or Medicine 2015
William C. Campbell, Satoshi Ōmura, Youyou Tu

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The Nobel Prize in Physiology or Medicine 2015

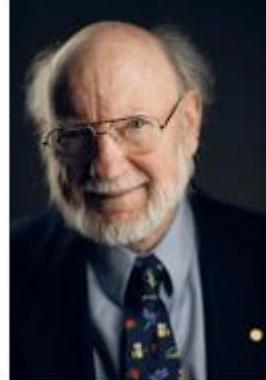


Photo: A. Mahmoud
William C. Campbell
Prize share: 1/4

Photo: A. Mahmoud
Satoshi Ōmura
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Photo: A. Mahmoud
Youyou Tu
Prize share: 1/2

The Nobel Prize in Physiology or Medicine 2015 was divided, one half jointly to William C. Campbell and Satoshi Ōmura "for their discoveries concerning a novel therapy against infections caused by roundworm parasites" and the other half to Youyou Tu "for her discoveries concerning a novel therapy against Malaria".

这篇中文论文在世界上的影响如何？

能查到在SCI中的被引情况吗？

Web of Science

检索

选择数
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参考文献: 第 1 - 2 条, 共 2

基本检索
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查找引用
第 1 步:
* 注意: 辅助
Tu Y*
Yao X
查看缩写
1981

选择	被引作者	被引著作 [显示完整标题]	出版年	卷	期	页	标识符	施引 文献 **	查看 记录
<input checked="" type="checkbox"/>	Tu, YY + [显示所有作者]	Yao Xue Xue Bao	1981	16	5	366		19	
<input checked="" type="checkbox"/>	Tu, YY + [显示所有作者]	YAO XUE XUE BAO	1981	116		366		2	

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检索

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检索结果: 18
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出版日期 (降序)
出版日期 (升序)
最近添加
被引频次 (降序)

Artemisia annua and artemisinin for cancer therapy
作者: Tu, Youyou; Fu, Jian; N'Go, Ines; 等.
期刊: CHEMISTRY-A EUROPEAN JOURNAL 卷: 23 期: 43 页: 10423-10429 出版年: AUG 1 2017
出版商处的全文 查看摘要

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(来自 Web of Science 的核心合集)

使用次数 ▾

被引频次 (升序)
使用次数 -- 最近 100 天
使用次数 -- 2013 年至今

2. **Potent Mycobacterium tuberculosis UGM Inhibitors**
作者: Villaume, Sydney A.; Fu, Jian; N'Go, Ines; 等.
期刊: CHEMISTRY-A EUROPEAN JOURNAL 卷: 23 期: 43 页: 10423-10429 出版年: AUG 1 2017
出版商处的全文 查看摘要

被引频次: 2
(来自 Web of Science 的核心合集)

使用次数 ▾

3. Strategies to enhance biologically active-secondary metabolites in cell cultures of Artemisia - current
作者: Klayman, D.L.
期刊: SCIENCE 卷: 228 期: 4703 页: 1049-1055 出版年: 1985
出版商处的全文

被引频次: 0
(来自 Web of Science 的核心合集)

使用次数 ▾

1. **QINGHAOSU (ARTEMISININ) - AN ANTIMALARIAL DRUG FROM CHINA**

作者: KLAYMAN, DL
SCIENCE 卷: 228 期: 4703 页: 1049-1055 出版年: 1985

出版商处的全文

被引频次: 1,558

(来自 Web of Science 的核心合集)

使用次数 ▾

2. **The discovery of artemisinin (qinghaosu) and gifts from Chinese medicine**

作者: Tu, Youyou
NATURE MEDICINE 卷: 17 期: 10 页: 1217-1220 出版年: OCT 2011

出版商处的全文

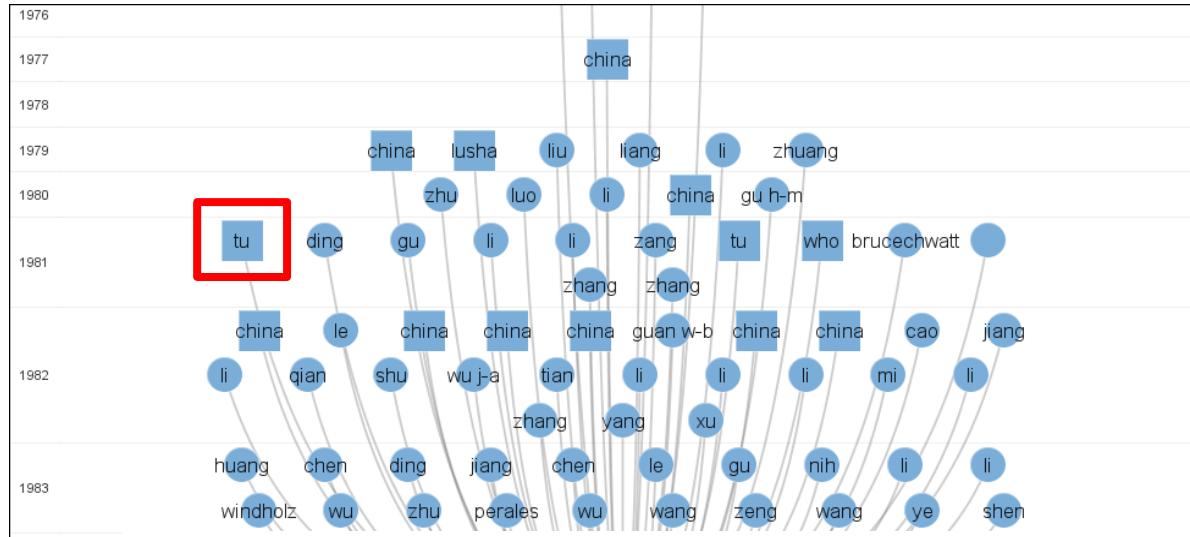
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(来自 Web of Science 的核心合集)

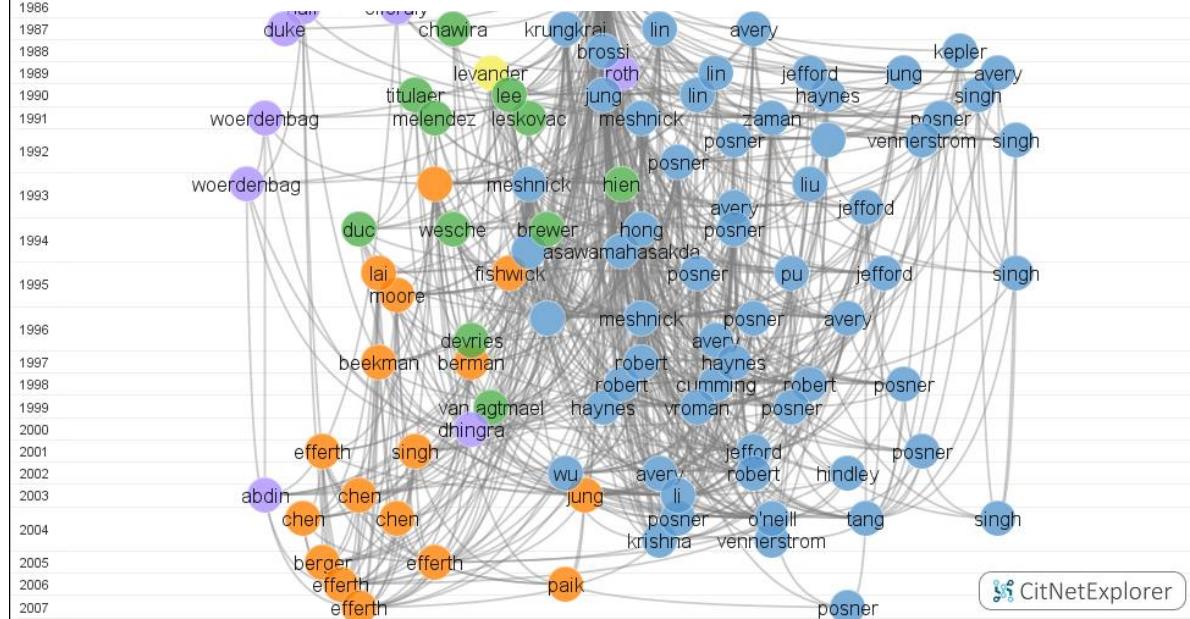
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青蒿素科学与技术的经典文献

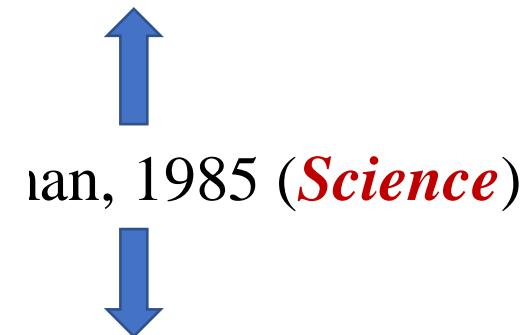
论文	Cited by artemisinin related patents	Cited by artemisinin related publications
Klayman D. (1985)	19	1361



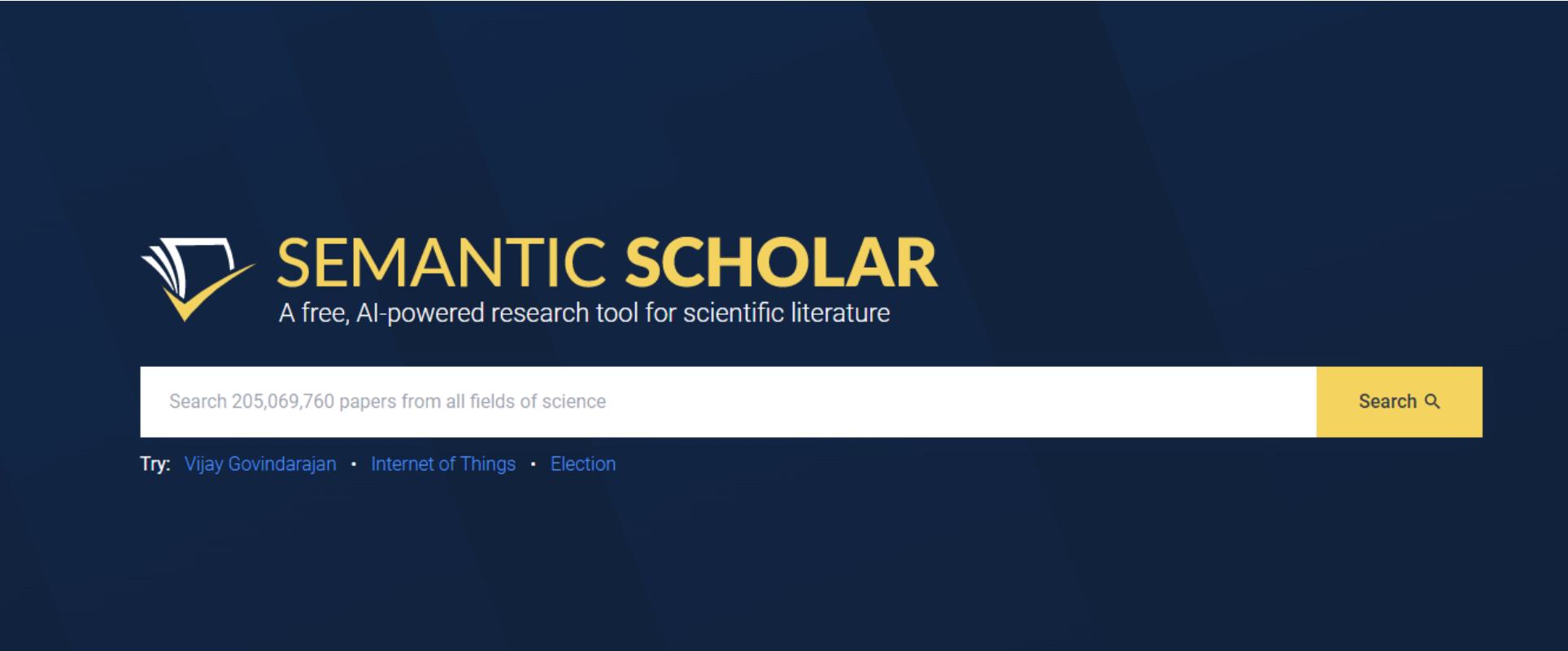
**青蒿素的研究从一开始就是
面向重大需求的前沿研究工作!**



92 cited references, 涉及43种期刊、著作或会议;
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500+ Journals



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All Fields



CRISPR gene-editing tested in a person for the first time.



FAQ

DOI: 10.1038/nature.2016.20988 · Corpus ID: 4456184

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[David Cyranoski](#) · Published in [Nature](#) 2016 · Biology, Medicine

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Influence

SHOWING 1-10 OF 120 CITATIONS, ESTIMATED 67% COVERAGE 

First-in-human Phase 1 CRISPR Gene Editing Cancer Trials:Are We Ready?

Françoise Baylis, Marcus McLeod • Medicine, Biology • Current gene therapy • 2017

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[CITES BACKGROUND](#)

 [HIGHLY INFLUENCED](#)

Genome Editing: A New Horizon for Oral and Craniofacial Research

Ning Yu, Jie-gang Yang, Yuji Mishina, William V Giannobile • Medicine • Journal of dental research • 2019

 [VIEW 4 EXCERPTS](#)

[CITES BACKGROUND](#)

 [HIGHLY INFLUENCED](#)

Advancements and Obstacles of CRISPR-Cas9 Technology in Translational Research

Liting You, Ruizhan Tong, +3 authors You Lu • Medicine, Computer Science • Molecular therapy. Methods & clinical

[Application of CRISPR/Cas9-Based Gene Editing in HIV-1/AIDS Therapy](#)

[Qiaoqiao Xiao](#), [Deyin Guo](#), [Shuliang Chen](#) • Biology, Medicine • *Front. Cell. Infect. Microbiol.* • 2019

[≡ VIEW 1 EXCERPT](#)

[CITES BACKGROUND](#)

CITES BACKGROUND FROM "CRISPR GENE-EDITING TESTED IN A PERSON FOR THE..."

The modified human T cells were reinfused back into an individual with metastatic nonsmall cell lung cancer, which is supposed to have a promising result ([Cyranoski, 2016](#)).

[Attitudes of clinical geneticists and certified genetic counselors to genome editing and its clinical applications: A nation-wide questionnaire survey in Japan](#)

[Iku Taguchi](#), [Takahiro Yamada](#), +10 authors [Shinji Kosugi](#) • Biology, Medicine • *Journal of Human Genetics* • 2019

[≡ VIEW 1 EXCERPT](#)

[CITES BACKGROUND](#)

CITES BACKGROUND FROM "CRISPR GENE-EDITING TESTED IN A PERSON FOR THE..."

This technology has been at research stage and has not matured enough for clinical applications yet, except for some clinical trials [28, 29].

Paper Mentions

NEWS ARTICLE

[Should we be Into Eugenics?](#)

Medium US

27 February 2020

NEWS ARTICLE

[Quest to Use CRISPR Against Disease Gains Ground](#)

Scientific American

7 January 2020

NEWS ARTICLE

[What CRISPR-baby prison sentences mean for research](#)

Google News

3 January 2020

BLOG POST

[CRISPR-modifizierte Immunzellen bei ersten Krebspatienten sicher eingesetzt](#)

medONLINE

7 November 2019

BLOG POST

[Inside China's Play to Become the World's CRISPR Superpower](#)

Singularity Hub

18 August 2019

NEWS ARTICLE

[The experiment that geneticists say went too far](#)

CNN News

1 December 2018

NEWS ARTICLE

[The FDA Has Just Put The Brakes on a Major CRISPR Trial in Humans](#)

Science Alert

1 June 2018

NEWS ARTICLE

[Gentechnik: Genschere verschnippelt sich doch nicht](#)

Der Tagesspiegel

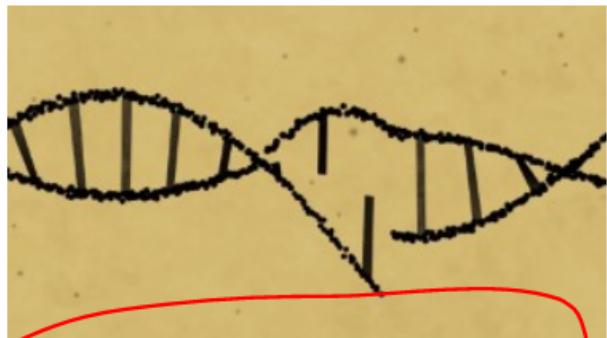
3 April 2018

'A gold rush on new kind of knowledge'

That the announcement of the world's first genetically edited babies came out of China is perhaps not surprising.

Chinese scientists have accomplished many firsts in the genome world, including the first CRISPR-edited monkeys, the first use of the gene-editing tool CRISPR-Cas9 [in humans](#), and the first [reported use of gene editing technology](#) to modify nonviable human embryos.

China has also pumped huge amounts of government money into gene-editing technology, using it to lure leading Chinese scientists living abroad back to the country, as well as foreigners who see the country as fertile ground for this kind of research.



Related Article: Chinese scientists use gene-editing techniques in humans for first time

"I just think right now China is a lot more driven, they incentivize their scientists to move faster and be bold and it shows," said Victor J. Dzau, President of the Institute of Medicine at the US National Academy of Medicine.

Last year, China [spent a record](#) 1.76 trillion yuan (\$254 billion) on [research and development](#), and the country is catching up with the US' investment in the same area, spurring a genetic arms race that has been labeled "Sputnik 2.0" by Dr. Carl June, an

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have been testing CRISPR's much less controversial ability to disable or correct problematic genes in other cells in order to treat a host of diseases.

In 2016, Chinese researchers announced that they had treated the first person with a CRISPR–Cas9 therapy designed to fight cancer. In cells extracted from a participant's blood, the researchers disabled the gene that codes for a protein called PD-1, which holds the immune system in check but can shield cancer cells in the process. The scientists then reinjected the cells.

By 2019, the US government's clinicaltrials.gov database listed more than a dozen active studies that are testing CRISPR–Cas9 as a treatment for a range of diseases from cancer to HIV and blood disorders.

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Paper Title



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Paper URL



Health Insurance and Long-Term Care Services for the Disabled Elderly in China: ...

Prior works

Derivative works

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Origin paper

Health Insurance and Long-Term Care Services for the Disabled Elderly in...

Linhong Chen, Xiaolu Zhang, Xiaocang... 2020

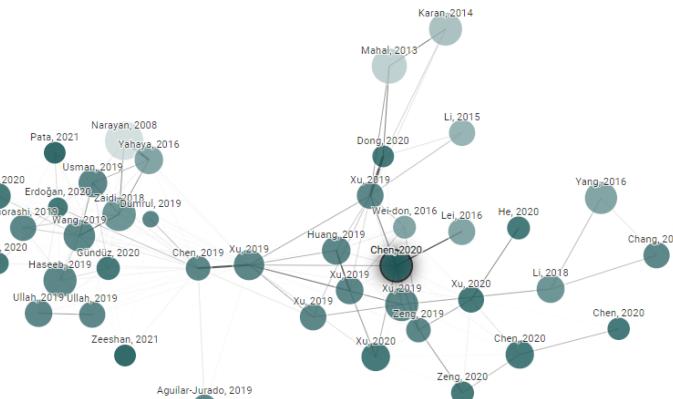
The availability and affordability of long-term care for disabled older...

P. Lei, Zhixin Feng, Zhuo-chun Wu 2016

Family Economic Burden of Elderly Chronic Diseases: Evidence from China
Xiaocang Xu, Xiuquan Huang, Xiaolu... 2019

An assessment of the economic burden of senile chronic diseases in...

Xiayan Dong, Linhong Chen, Zhiming... 2020



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2008

2021

Health Insurance and Long-Term Care Services for the Disabled Elderly in China: Based on CHARLS Data

Linhong Chen, Xiaolu Zhang, Xiaocang Xu 2020, Risk management and healthcare pol...

28 Citations, 47 References

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Purpose This paper aimed to explore the relationship between the different factors, especially health insurance, and the availability of long-term care (LTC) services, among the disabled elderly. Methods Based on the data of China Health and Retirement Longitudinal Study (CHARLS), the logistic regression model was utilized



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Features

Background: In China, there are two major government incentives in the development of medical informatics, yet there have been limited systematic investigations on the pattern of interactions between informatics concepts/techniques and the health/medical needs.

Objective: We propose an approach to mapping the interplay between different knowledge entities by using the tree structure of Medical Subject Headings (MeSH) to gain insights into the interactions between informatics-supply and health-demand in China.

Methods: All terms under the MeSH tree parent node “Diseases [C]” or node “Health [N01.400]” or “Public Health [N06.850]” were labelled as H. All terms under the node “Information Science [L]” as I and all terms under node “Analytical, Diagnostic and Therapeutic Techniques, and Equipment [E]” as T. The H-I and H-I-T interactions can be measured by using their co-occurrences in a given publication.

Results: In China, Medical informatics publications with both H- and I-related MeSH terms increased rapidly. Still, the overall H-I

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Features

Background In China there are two major government incentives in the development of medical informatics yet there have been limited systematic investigations on the pattern of interactions between informatics concepts techniques and the health medical needs Objective We propose an approach to mapping the interplay between different knowledge entities by using the tree structure of Medical Subject Headings MeSH to gain insights into the interactions between informatics supply and health demand in China Methods All terms under the MeSH tree parent node Diseases [C] or node Health [N01 400] or Public Health [N06 850] were labelled as H All terms under the node Information Science [L] as I and all terms under node Analytical Diagnostic and Therapeutic Techniques and Equipment [E] as T The H I and H I T interactions can be measured by using their co occurrences in a given publication Results In China Medical informatics publications with both H and I related MeSH terms increased rapidly Still the overall H I interactions are sparse if compared to the United States The most obvious interactions were only focused on several diseases with two primary informatics techniques In the United States almost all diseases have a strong interaction with informatics techniques especially using computing methodologies By establishing the H I T connection it was found that the H I T link in Chinese informatics research is weaker than in US research We recommend enhancing the technology transfer for medical informatics in China There is a positive correlation between the burden and the informatics research efforts for diseases in China Artificial Intelligence AI is a competing field of medical informatics research both China and the United States focusing on deep neural networks Besides AI technology the US has more emphasis on natural language processing Conclusions Research on evidence based medical informatics and electronic health records EHRs should be strengthened to improve the real world applications of health information technologies and big data in health and medicine in the future

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Export Data

MeSH Terms

- i United States
- i Medical Subject Headings
- i Natural Language Processing
- i Electronic Health Records
- i Artificial Intelligence
- i Big Data
- i Technology Transfer
- i Public Health
- i Motivation
- i Medical Informatics
- i Information Science
- i Computing Methodologies
- i Neural Networks, Computer
- i Government
- i Asian Continental Ancestry Group
- i China

PubMed/MEDLINE Similar Articles

Additional Terms
 Humans

The following articles are 10 similar PubMed Related Citations that were also used in computing these MeSH recommendations. The order is from most to least relevant. Selecting any of the titles opens a new window or tab with that related citation in PubMed's Abstract view.

1. *informatics: Identifying and Tracking Informatics Sub-Discipline Terms in the Literature. PMID: [25998007](#)
2. The evolution of medical informatics in China: A retrospective study and lessons learned. PMID: [27318067](#)
3. The Gap in Medical Informatics and Continuing Education Between the United States and China: A Comparison of Conferences in 2016. PMID: [28637638](#)
4. Artificial Intelligence in Health in 2018: New Opportunities, Challenges, and Practical Implications. PMID: [31419815](#)
5. Public Health, Population Health, and Epidemiology Informatics: Recent Research and Trends in the United States. PMID: [29063572](#)
6. State of the art in clinical informatics: evidence and examples. PMID: [23974543](#)
7. On the foundation and structure of medical informatics. PMID: [8591423](#)
8. An overview of medical informatics education in China. PMID: [22704233](#)
9. Publication trends in the medical informatics literature: 20 years of "Medical Informatics" in MeSH. PMID: [19159472](#)
10. Trends and characteristics of global medical informatics conferences from 2007 to 2017: A bibliometric comparison of conference publications from Chinese, American, European and the Global Conferences. PMID: [30415715](#)



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Features

Is it correct to argue for [health informatics](#) research to be focussed on greatest [burden of disease](#) or years of life lost A counter argument would be for it to be focussed on where it can have most impact The disease based approach cuts across key issues such as a [patient](#) focus or support of [preventive health](#) and salutogenic [lifestyle](#) applications [Integrated care](#) across multi [morbidity](#) is increasingly recognised as important but would not score highly in the approach taken in this paper Disease based linkage will also tend to bias towards biophysical and medical topics Means of treatment delivery and the people based contributions of professions such as nursing and [therapists](#) will not be identified strongly but are important for holistic [person](#) centred [care](#) and good patient outcomes to a large extent they are disease independent

[Start PubMed Search](#)

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MeSH Terms

- [Humans](#)
- [Cost of Illness](#)
- [Medical Informatics](#)
- [Self Care](#)
- [Preventive Health Services](#)
- [Allied Health Personnel](#)
- [Morbidity](#)
- [Life Style](#)
- [Delivery of Health Care, Integrated](#)

PubMed/MEDLINE Similar Articles

The following articles are 10 similar PubMed Related Citations that were also used in computing these MeSH recommendations. The order is from most to least relevant. Selecting any of the titles opens a new window or tab with that related citation in PubMed's Abstract view.

1. Instantiating informatics in nursing practice for integrated patient centred holistic models of care: a discussion paper. PMID: [26890201](#) 
2. Sliding doors: Did drama-based inter-professional education improve the tensions round person-centred nursing and social care delivery for people with dementia: A mixed method exploratory study. PMID: [28088047](#)
3. Development of a framework for person-centred nursing. PMID: [17078823](#)
4. Person-centred web-based support--development through a Swedish multi-case study. PMID: [24139057](#)

Abstract

Aim

A discussion on how informatics knowledge and competencies can enable nursing to instantiate transition to integrated models of care.

Background

Costs of traditional models of care are no longer sustainable consequent to the spiralling incidence and costs of chronic illness. The international community looks towards technology-enabled solutions to support a shift towards integrated patient-centred models of care.

译

Design

Discussion paper.

Data sources

A search of the literature was performed dating from 2000–2015 and a purposeful data sample based on relevance to building the discussion was included.

概要

一、文献海洋中，如何开展精准查询法和引文跟踪法？

几个习惯都要有：

- 浏览 vs. 查询；
- 被动接收 vs. 主动检索；
- 文档查询 vs. 文本挖掘

二、大数据时代，如何开展全域信息获取？

- 超越文献，定位前端的基金资助、后端的专利技术等。

> J Am Med Inform Assoc. 2020 Jun 1;27(6):972-975. doi:

Is it time for computable evid

Adam G Dunn ^{1 2 3}, Florence T Bourgeois ^{3 4}

Affiliations + expand

PMID: 32337600 PMCID: PMC7309243 DOI: 10.1093/jamia/ocaa114

[Free PMC article](#)

Abstract

Efforts aimed at increasing the pace of evidence synthesis have been made by publishing articles, but these are a relatively delayed, incomplete, and often biased source of results data. Compared to those in bibliographic databases, structured results data registries may be more timely, complete, and accessible. The advantages of using structured results data include the ability to rapidly accumulate relevant evidence and use it to signal what is known as well as to prospectively assign trials to already published results. The use of structured trial data may provide the impetus to build continuous evidence surveillance.

Cited by 2 articles

The Evolution of Clinical Knowledge During COVID-19: Towards a Global Learning Health System.
Verspoor K.

Yearb Med Inform. 2021 Aug;30(1):176-184. doi: 10.1055/s-0041-1726503. Epub 2021 Sep 3.

PMID: 34479389 [Free PMC article](#).

[It is time for computable evidence synthesis: The COVID-19 Knowledge Accelerator initiative.](#)

Alper BS, Richardson JE, Lehmann HP, Subbian V.

J Am Med Inform Assoc. 2020 Aug 1;27(8):1338-1339. doi: 10.1093/jamia/ocaa114.

PMID: 32442263 [Free PMC article](#). No abstract available.

Publication types

> Research Support, N.I.H., Extramural

MeSH terms

- > Clinical Trials as Topic*
- > Databases as Topic
- > Information Storage and Retrieval / methods*
- > Systematic Reviews as Topic*

Grant support

R01 LM012976/LM/NLM NIH HHS/United States

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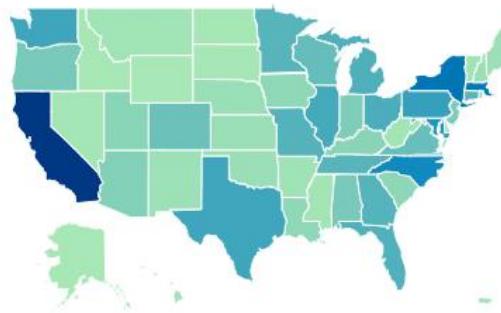
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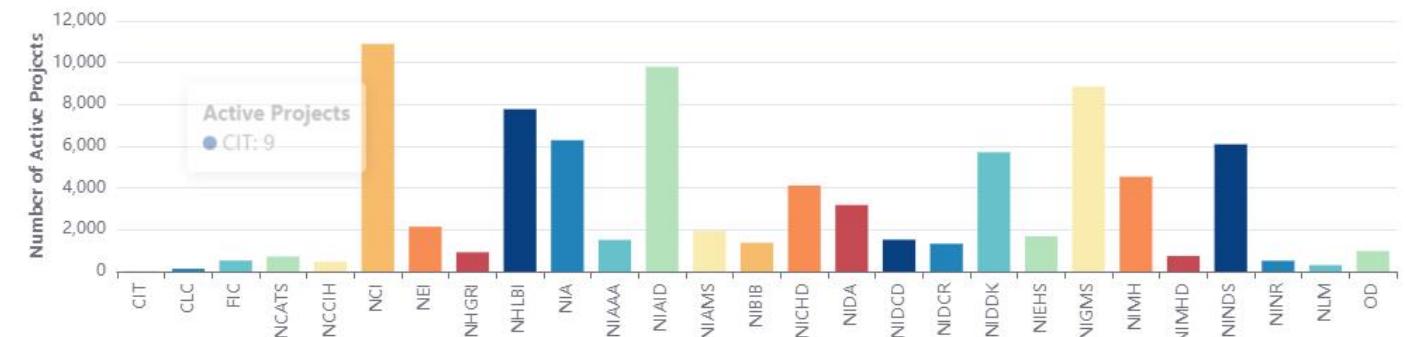
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Active Projects by Institute/Center

Select a bar to view projects for an Institute/Center



<https://reporter.nih.gov/>

Advanced Projects Search

Fiscal Year ?

Active Projects

Current FY is 2021

Agency/Institute/Center ?

Admin Funding

Principal Investigator (PI) ?

PI Names or Profile IDs, semicolon ";" separated

Project Number/Application ID ? 1 ×

R01 LM012976

Format: 5R01CA012345-04/8515397, semicolon ";" separated

Organization ?

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1 Project

Search Criteria  Fiscal Year: Active Projects Project Number/Application ID: R01 LM012976

Projects Publications Patents Clinical Studies News & More

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Publications Search

Find publications associated with extramural or intramural funded projects using PubMed IDs (PMID) or PubMed Central IDs (PMC ID).

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 Map

Filters

 Fiscal Years

 Org Names

 Agencies

 States

 Countries

 Principal Investigators

Coupling Results Data from ClinicalTrials.gov and Bibliographic Databases to Accelerate Evidence Synthesis

5 R01LM012976-03

 BOURGEOIS, FLORENCE

BOSTON CHILDREN'S HOSPITAL

2021

NLM

NLM

\$328,000

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Results are sorted by Relevance

 List

 Charts

 Map

Coupling Results Data from ClinicalTrials.gov and Bibliographic Databases to Accelerate Evidence Synthesis

Description

Details

Sub-Projects

Publications

Patents

Outcomes

Clinical Studies

News and More

History

Similar Projects

Project Number
5R01LM012976-03

Contact PI/Project Leader
BOURGEOIS, FLORENCE

Awardee Organization
BOSTON CHILDREN'S HOSPITAL

Description

Abstract Text

Project Summary Clinical trials are foundational to evidence-based medicine, but results reporting from trials is incomplete and frequently delayed. It is estimated that as many as half of clinical trials are not published and as many as half of published trials underreport or misreport outcomes. This type of results reporting distorts the evidence available to clinicians—particularly when it comes to assessing the safety of interventions like drugs and devices—and may place patients at unnecessary risk. There is a critical need for novel methods to identify and monitor drug safety data. Through the infrastructure provided by ClinicalTrials.gov, structured trial results (including safety findings) are now becoming available for an increasing number of trials in a comprehensive and timely fashion. However, access and use of these data in evidence synthesis tasks remain limited. ClinicalTrials.gov is the largest single registry for clinical studies worldwide and includes more than 260,000 registered studies. Of the 108,941 completed trials registered with the site, 20% have uploaded results data for a total of 7.85 million participants. Results data reported on ClinicalTrials.gov have the potential to fill gaps created by delays and biases in published articles and provide an earlier and more complete overview of available trial evidence. We propose to develop novel informatics approaches based on combinations of information retrieval and machine learning methods to facilitate access and analysis of trial results reported in this registry. Focusing on trials testing drug interventions in type 2 diabetes, obesity, and oncology, we perform this work in three specific aims: 1) Develop semi-automated trial screening for identifying and aggregating trials relevant to a clinical intervention; 2) Extract adverse event and safety outcomes data from results reported in the registry; and 3) Perform validation studies to assess detection of adverse events and performance of semi- automated meta-analyses of safety outcomes. Methods developed in this project will facilitate timely, broad- scale use of trial results reported on ClinicalTrials.gov in order to augment the availability of comprehensive and timely drug safety data. All methods will be made publicly available in order to support adverse event monitoring and systematic reviews of drug interventions.

History

Total project funding amount for 3 projects is \$1,003,250*

 Export

* Only NIH, CDC and FDA funding data

Project Number	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
Coupling Results Data from ClinicalTrials.gov and Bibliographic Databases to Accelerate Evidence Synthesis							
5R01LM012976-03		 BOURGEOIS, FLORENCE 	BOSTON CHILDREN'S HOSPITAL	2021	NLM	NLM	\$328,000
Coupling Results Data from ClinicalTrials.gov and Bibliographic Databases to Accelerate Evidence Synthesis							
5R01LM012976-02		 BOURGEOIS, FLORENCE 	BOSTON CHILDREN'S HOSPITAL	2020	NLM	NLM	\$328,000
Coupling Results Data from ClinicalTrials.gov and Bibliographic Databases to Accelerate Evidence Synthesis							
1R01LM012976-01		 BOURGEOIS, FLORENCE 	BOSTON CHILDREN'S HOSPITAL	2019	NLM	NLM	\$347,250

Similar Projects

Match Score	Project Number	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
Coupling Technology with Mind-Body Exercise to Facilitate Physical Activity in Patients with Chronic Cardiopulmonary Disease								
196	5R34AT009354-03		 YEH, GLORIA Y 	BETH ISRAEL DEACONESS MEDICAL CENTER	2019	NCCIH	NCCIH	\$237,717
Clinical safety and efficacy of pharmacogenetics in Veteran care								
215	5IK2CX001262-05		 VASSY, JASON L 	VA BOSTON HEALTH CARE SYSTEM	2021	VA		
Alpha-synuclein/tau coupling in Alzheimer's disease								
190	1R21AG065693-01		 LESNE, SYLVAIN E. 	UNIVERSITY OF MINNESOTA	2020	NIA	NIA	\$422,892
Sub-Clinical Vascular Dysfunction in American-Style Football Players: Temporal Trends, Mechanisms, and Effects on Ventriculo-Arterial Coupling								



基金资助机构

- 论文Acknowledgement信息

Acknowledgements

This work was funded in part by the National Institutes of Health (NIH) under the National Library of Medicine (NLM) grant 2R01LM012086, and by the National Science Foundation (NSF) CAREER award 1750978.

The screenshot shows the NSF homepage with a search bar and navigation menu. Below, the "Simple Search Results" page is displayed for award 1750978. The results show one entry for a CAREER award titled "CAREER: Structured Scientific Evidence Extraction: Models and Corpora". The entry includes details like Award Number, Principal Investigator, Co-Principal Investigator, Organization, NSF Organization, Start Date, Award Amount, and Relevance. There are links to export the results in CSV, XML, Excel, or Text formats, and options to sort by relevance or page size. The results are displayed in both Table and List formats, with a single result shown per page.

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 Award Abstract # 1750978
CAREER: Structured Scientific Evidence Extraction: Models and Corpora

NSF Org:	IIS Div Of Information & Intelligent Systems
Awardee:	NORTHEASTERN UNIVERSITY
Initial Amendment Date:	February 5, 2018
Latest Amendment Date:	June 1, 2020
Award Number:	1750978
Award Instrument:	Continuing Grant
Program Manager:	Hector Munoz-Avila hmunoz@nsf.gov (703)292-4481 IIS, Div. Of Information & Intelligent Systems CSE Direct For Computer & Info Scie & Engnr
Start Date:	July 1, 2018
End Date:	June 30, 2023 (Estimated)
Total Intended Award Amount:	¥549,933.00
Total Awarded Amount to Date:	\$565,933.00
Funds Obligated to Date:	FY 2018 = ¥115,343.00 FY 2019 = ¥132,659.00 FY 2020 = ¥317,931.00
History of Investigator:	Byron Wallace (Principal Investigator) b.wallace@northeastern.edu
	Northeastern University 360 HUNTINGTON AVE

ABSTRACT

Scientific evidence is primarily disseminated in free-text journal articles. Drawing upon this evidence to make decisions or inform policies therefore requires perusing relevant articles and manually extracting the findings of interest. Unfortunately, this process is time-consuming and has not scaled to meet the demands imposed by the torrential expansion of the scientific evidence base. This work seeks to design novel Natural Language Processing (NLP) methods that can automatically "read" and make sense of unstructured published scientific evidence. This is critically important because decisions by policy-makers, care-givers and individuals should be informed by the entirety of the relevant published scientific evidence; but because evidence is predominantly unstructured -- and hence not directly actionable -- this is currently impossible in practice. Consider clinical medicine, an important example which serves as the target domain of this proposal (although the framework and models will generalize to other scientific areas). Roughly 100 articles describing trials were published every single day in 2015. Healthcare professionals cannot possibly make sense of this, and thus treatment decisions must be made without full consideration of the available evidence. Methods that can automatically infer from this torrential mass of unstructured literature which treatments are actually supported by the evidence would facilitate better, evidence-based decisions. Toward this end, this research seeks to design NLP models capable of mapping from natural language scientific articles describing studies or trials to structured "evidence frames" that codify the interventions and outcomes studied, and the reported findings concerning these. NLP technology is not presently up to this task. Therefore, this project will support core methodological contributions that will advance systems for data extraction and machine reading of lengthy articles; these will have impact beyond the present motivating application.

From a technical perspective, the focus of this work concerns developing novel, interpretable (transparent) neural network models for extraction from and inference over lengthy articles. Specifically, this project aims to design models that can automatically identify treatments and associated outcomes from free-texts, and then infer the reported comparative effects of the former with respect to the latter. This pushes against limits of existing language technology capabilities. In particular, this necessitates models that perform deep analysis of individual, potentially lengthy, technical documents. Furthermore, model transparency is critical here, as domain experts must be able to recover from where in documents evidential claims were inferred. New corpora curated for this project (to be shared with the broader community) will facilitate core NLP research on such models. To realize the aforementioned methodological aims, the researchers leading this project will develop conditional and dynamic "attentive" neural models. Specific methodological lines of research to be explored include: (i) Models equipped with conditional, sparse attention mechanisms over textual units that reflect scientific discourse structure to achieve accurate and transparent extraction of, and inference concerning, reported evidence. (ii) Neural sequence tagging models that take multiple 'reads' of a text, exploiting iteratively adjusted conditional document representations as global context to inform local predictions. A project website (<http://www.bryonwallace.com/evidence-extraction>) provides access to papers, datasets and other project outputs.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

PUBLICATIONS PRODUCED AS A RESULT OF THIS RESEARCH

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Garcia-Olano, Diego and Onoe, Yasumasa and Baldini, Ioana and Ghosh, Joydeep and Wallace, Byron C. and Varshney, Kush "Biomedical Interpretable Entity Representations" *Proceedings of the Association for Computational Linguistics (ACL)* , 2021 [Citation Details](#)

Benjamin E. Nye, Jay DeYoung "Understanding Clinical Trial Reports: Extracting Medical Entities and Their Relations" *AMIA 2021 Virtual Informatics Summit* , 2021 [Citation Details](#)

Marshall, Iain J and Nye, Benjamin and Kuiper, Joël and Noel-Storr, Anna and Marshall, Rachel and Maclean, Rory and Soboczenski, Frank and Nenkova, Ani and Thomas, James and Wallace, Byron C "Trialstreamer: A living, automatically updated database of clinical trial reports" *Journal of the American Medical Informatics Association* , v.27 , 2020 <https://doi.org/10.1093/jamia/oca163> [Citation Details](#)

Wadhwa, Somin S. and Yin, Kanhua C. and Hughes, Kevin and Wallace, Byron "Semi-Automating Knowledge Base Construction for Cancer Genetics" *Automated Knowledge Base Construction (AKBC)* , 2020 [Citation Details](#)

Nye, Benjamin E. and Nenkova, Ani J. and Marshall, Iain C. and Wallace, Byron "Trialstreamer: Mapping and Browsing Medical Evidence in Real-Time" *Proceedings of the Association for Computational Linguistics (ACL)* , 2020 [Citation Details](#)

Jain, Sarthak C. and Wiegrefe, Sarah and Pinter, Yuval and Wallace, Byron "Learning to Faithfully Rationalize by Construction" *Proceedings of the Association for Computational Linguistics (ACL)* , 2020 [Citation Details](#)

DeYoung, Jay and Lehman, Eric and Nye, Ben and Marshall, Iain J. and Wallace, Byron C. "Evidence Inference 2.0: More Data, Better Models" *BioNLP: Workshop on Biomedical Natural Language Processing* , 2020 [Citation Details](#)

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BASIC SEARCH CRITERIA:

Keyword(s):

Opportunity Number:

CFDA:

SEARCH

OPPORTUNITY STATUS:

Forecasted (292)
 Posted (2,442)
 Closed (4,667)
 Archived (60,499)

FUNDING INSTRUMENT TYPE:

All Funding Instruments
 Cooperative Agreement (992)
 Grant (1,906)
 Other (155)
 Procurement Contract (51)

ELIGIBILITY:

Independent school districts (1,074)
 Individuals (78)
 Native American tribal governments (Federally recognized) (1,246)
 Native American tribal organizations (other than Federally recognized tribal governments) (1,171)

CATEGORY:

All Categories
 Agriculture (131)
 Arts (see 'Cultural Affairs' in CFDA) (21)
 Business and Commerce (29)
 Community Development (EPA)

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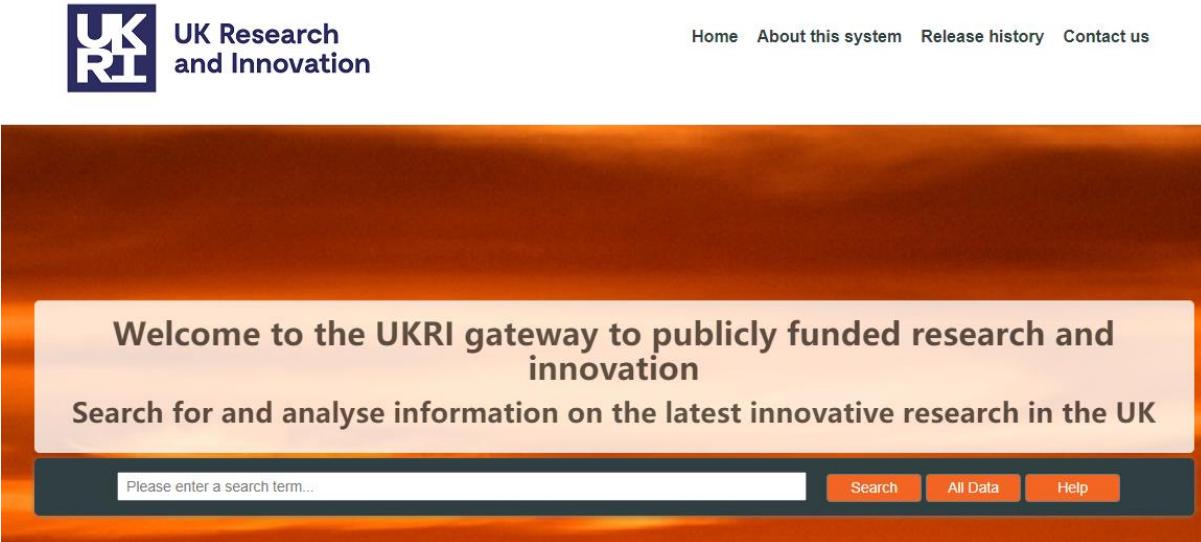
SORT BY: DATE RANGE:

1 - 25 OF 2734 MATCHING RESULTS: « Previous 1 2 3 4 5 6 ... 110 Next »

Opportunity Number	Opportunity Title	Agency	Opportunity Status	Posted Date ↓	Close Date
22-587	IUSE/Professional Formation of Engineers: Revolutionizing Engineering Departments	NSF	Posted	04/16/2022	07/18/2022
22-588	Improving Undergraduate STEM Education: Computing in Undergraduate Education	NSF	Posted	04/16/2022	08/18/2022
USDA-NRCS-FL-CIG-22-NOFO0001150	Conservation Innovation Grants (CIG) for Federal fiscal year (FY) 2022 – Florida	USDA-NRCS	Posted	04/15/2022	08/31/2022
USDA-NRCS-ME-MULTI-22-NOFO0001192	NRCS Maine Certified Nutrient Management Planner	USDA-NRCS	Posted	04/15/2022	06/13/2022
HHS-2022-ACL-AOA-LRLI-0049	Lifespan Respite Care Program: State Program Enhancement Grants	HHS-ACL	Posted	04/15/2022	06/14/2022
RFA-RM-22-024	Pilot Projects Investigating Understudied G Protein-Coupled Receptors, Ion Channels, and Protein Kinases (R03 Clinical Trial Not Allowed)	HHS-NIH11	Posted	04/15/2022	07/15/2022
EPA-R3-CBP-22-02	Chesapeake Bay Program Office Fiscal Year 2022 Request for Applications for: Chesapeake Bay Program Goal Implementation Teams Support, Scientific Community Support, and Summer Student Program Management	EPA	Posted	04/15/2022	05/31/2022
SFOP0008858	On-Demand Reports and Roundtables Program	DOS-INL	Posted	04/15/2022	06/15/2022
DOS-BAGHDAD-PD-2022-004	Iraqi Alumni Association Development	DOS-IRQ	Posted	04/15/2022	05/20/2022
O-BJA-2022-171277	BJA FY 22 Corrections Officer and Staff Safety and Wellness Center	USDOJ-OJP-BJA	Posted	04/15/2022	05/26/2022
TI-22-012	Rural Opioid Technical Assistance Regional Centers	HHS-SAMHS-SAMHSA	Posted	04/15/2022	06/14/2022
USDA-NRCS-PR-EQIP-22-NOFO0001206	Watershed Assessments for the National	USDA-NRCS	Posted	04/15/2022	05/25/2022

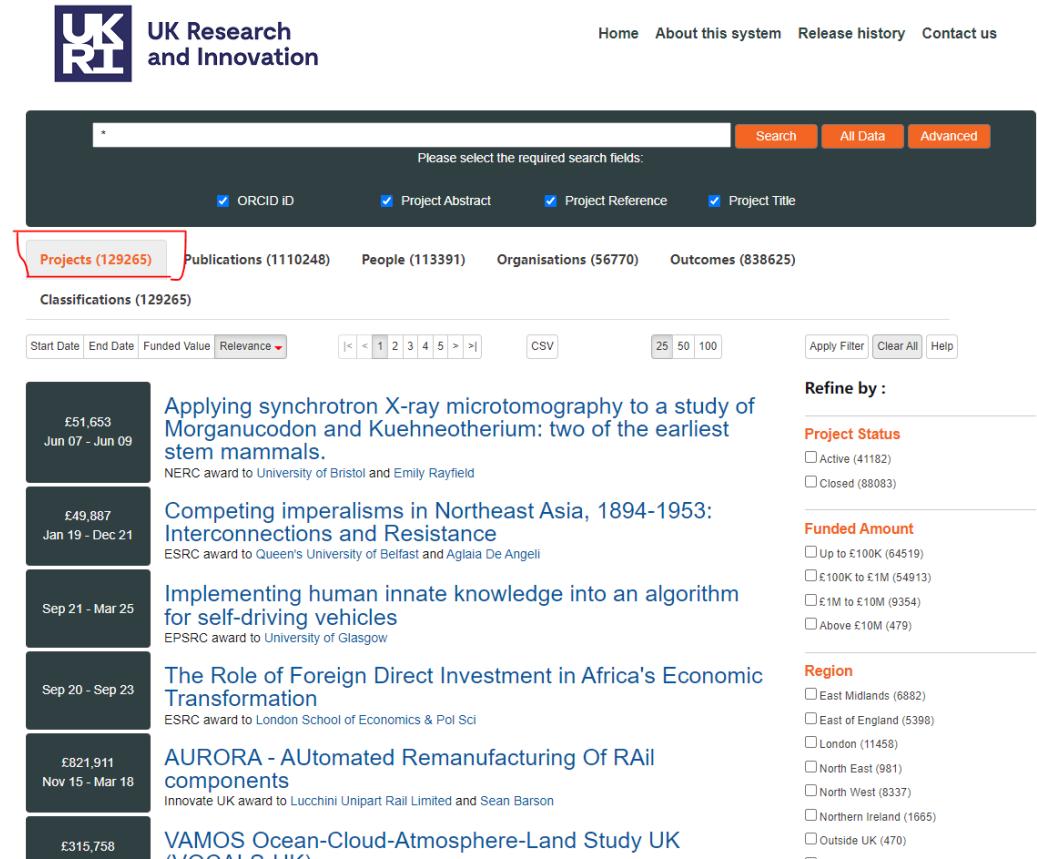
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The screenshot shows the UKRI GTR homepage. At the top left is the UKRI logo. Below it is a large orange banner with the text "Welcome to the UKRI gateway to publicly funded research and innovation" and "Search for and analyse information on the latest innovative research in the UK". A search bar at the bottom of the banner contains the placeholder "Please enter a search term...". Below the banner are three buttons: "Search", "All Data", and "Help".

<https://gtr.ukri.org/>



The screenshot shows the UKRI GTR search interface. At the top right are links for "Home", "About this system", "Release history", and "Contact us". Below this is a search bar with placeholder "* Please select the required search fields:" and checkboxes for "ORCID ID", "Project Abstract", "Project Reference", and "Project Title". A red box highlights the "Projects (129265)" tab, which is currently selected. Other tabs include "Publications (1110248)", "People (113391)", "Organisations (56770)", and "Outcomes (838625)". Below the tabs are filters for "Classification (129265)", "Start Date", "End Date", "Funded Value", "Relevance", and page navigation buttons (1-5, >). To the right are buttons for "CSV", "25 50 100", "Apply Filter", "Clear All", and "Help". On the far right is a "Refine by" sidebar with sections for "Project Status" (Active, Closed), "Funded Amount" (Up to £100K, £100K to £1M, £1M to £10M, Above £10M), and "Region" (East Midlands, East of England, London, North East, North West, Northern Ireland, Outside UK).

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The screenshot shows the LENS.ORG website interface. At the top, there is a navigation bar with links for "Our Apps" (Release 8.3), "Pricing", "Feature Tour", "About", "English", and a user account dropdown. Below the navigation bar, the main heading reads "Search, Analyze and Manage Patent and Scholarly Data". A subtext below it states: "Lens serves global patent and scholarly knowledge as a public good to inform science and technology enabled problem solving. No account required." There are two prominent buttons at the bottom left: "Watch Explainer Video" and "Take Tour". On the right side, a large search interface is displayed with the title "BRIDGING CULTURES Start Your Search". It includes tabs for "Patents", "Scholarly Works", and "Profiles", with "Patents" currently selected. A search bar with the placeholder "Search by Keyword or Patent Field" and a "Search" button is present. Below the search bar are three dropdown menus for "Dates", "Flags", and "Jurisdictions", each set to "Any". At the bottom right of the search interface are links for "Show Classifications" and "Structured Search".

<https://www.lens.org/>

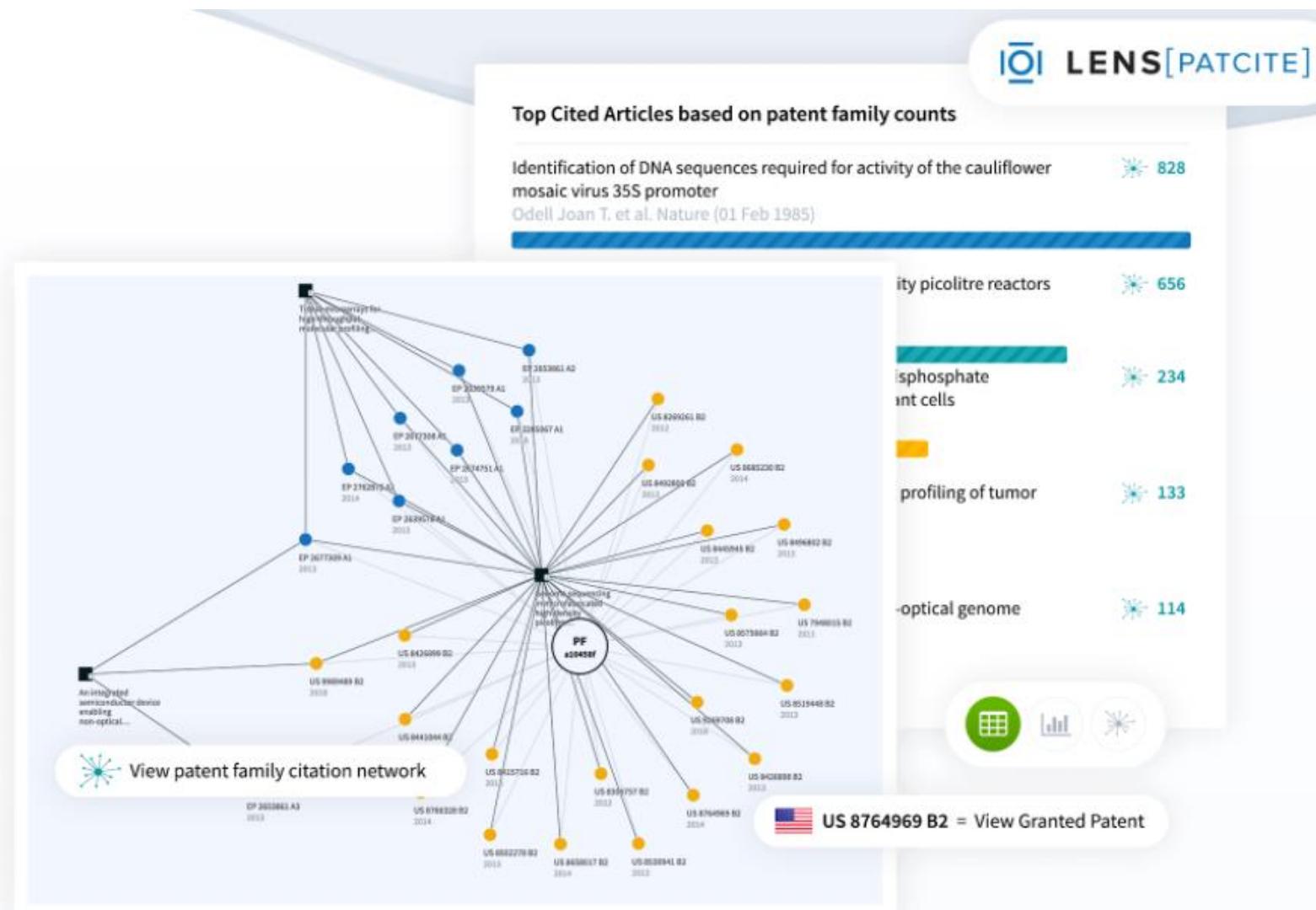
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可供个别研究人员/发明人、大学部门、机构甚至资助组织使用的动态地图。

➤ 浏览下面的示例投资组合



Format: Abstract ▾

Send to ▾

[Nat Biotechnol.](#) 2014 Jun;32(6):569-76. doi: 10.1038/nbt.2908. Epub 2014 Apr 25.

Dimeric CRISPR RNA-guided FokI nucleases for highly specific genome editing.

Tsai SQ¹, Wyvkekens N², Khayter C², Foden JA², Thapar V³, Reyon D¹, Goodwin MJ², Aryee MJ⁴, Joung JK¹.

⊕ Author information

Abstract

Monomeric CRISPR-Cas9 nucleases are widely used for targeted genome editing but can induce unwanted off-target mutations with high frequencies. Here we describe dimeric RNA-guided FokI nucleases (RFNs) that can recognize extended sequences and edit endogenous genes with high efficiencies in human cells. RFN cleavage activity depends strictly on the binding of two guide RNAs (gRNAs) to DNA with a defined spacing and

Full text links

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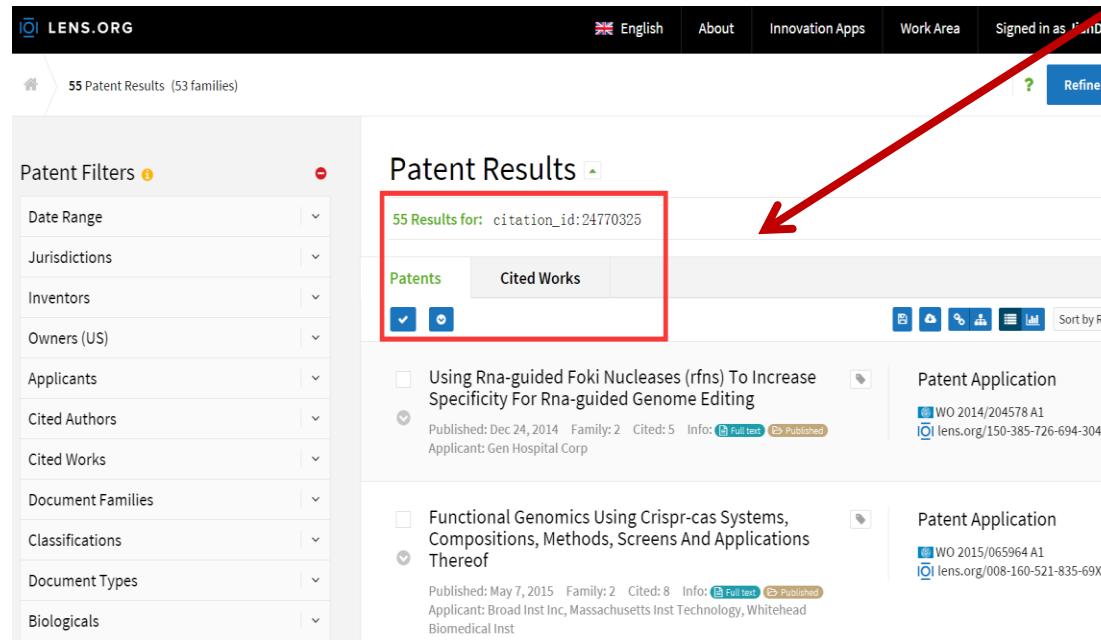
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LENS **Citing Patents**



The screenshot shows the IOI LENS.ORG website interface. At the top, there is a navigation bar with links for English, About, Innovation Apps, Work Area, and Signed in as 'JianDu'. Below the navigation bar, it says '55 Patent Results (53 families)' and 'Refine Set'. On the left, there is a 'Patent Filters' sidebar with dropdown menus for Date Range, Jurisdictions, Inventors, Owners (US), Applicants, Cited Authors, Cited Works, Document Families, Classifications, Document Types, and Biologicals. The main area is titled 'Patent Results' and displays a list of 55 results for 'citation_id:24770325'. The results are categorized into 'Patents' and 'Cited Works'. The first result is a 'Patent Application' titled 'Using Rna-guided Foki Nucleases (rfns) To Increase Specificity For Rna-guided Genome Editing', published on Dec 24, 2014, with a citation count of 5. The second result is another 'Patent Application' titled 'Functional Genomics Using Crispr-cas Systems, Compositions, Methods, Screens And Applications Thereof', published on May 7, 2015, with a citation count of 8. A red arrow points from the 'Cited Works' section of the search results back towards the 'Citing Patents' button on the right side of the page.

论文-专利引用大规模数据链接



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一个用于评价学术研究对创新的影响的指标

——基于lens.org平台上专利引用论文的数据

杜建

今天早上看到8月10日关于自然指数-创新（Nature Index Innovation）的报道，我一直关注的Lens.org平台首次推出了评价产品。Lens.org是澳大利亚一家独立的非营利性机构-Cambia的服务平台，是Cambia和昆士兰州理工大学联合开发的。他们与美国国立医学图书馆（NLM）和Crossref合作，把全球所有的专利族和它们引用的科技论文的PMID号、DOI号映射好，可以方便地检索一篇论文被专利引用的情况。

我当时发现Lens.org是一次偶然的机会，因为常用PubMed检索，发现每篇论文的Linkout部分，多了一个Len.org的标志。当时恰好正在承担汤森路透和中信所科学计量学联合实验室资助的一项课题“基于科学与技术关联分析测度转化研究：方法与实证”，苦于做专利-论文引用的数据，Lens.org平台为研究提供了很大帮助。



因为这个平台是开放的，我曾担心他们做的专利引用论文的链接不精确，曾致信他们首席科学家Osmat A Jefferson教授，她告诉我，他们会有论文发表，介绍他们的方法论。



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Query articles cited in patent literature (QNPL)

178 ■ Cited articles i**535** Unmatched identifiers

Citing patents/families distribution

4,217 ● Patent documents

1,668 ○ Grants

2,325 ● Applications

224 ● Others

2,578 ○ Corresponding patent families

Top Cited Articles based on patent family counts

Multiplex Genome Engineering Using CRISPR/Cas Systems
Cong Le et al. *Science* (New York, N.Y.) (03 Jan 2013) * 782Cpf1 is a single RNA-guided endonuclease of a class 2 CRISPR-Cas...
Zetsche Bernd et al. *Cell* (25 Sep 2015) * 543RNA-guided editing of bacterial genomes using CRISPR-Cas systems
Jiang Wenyan et al. *Nature biotechnology* (29 Jan 2013) * 375DNA targeting specificity of RNA-guided Cas9 nucleases
Hsu Patrick D. et al. *Nature biotechnology* (21 Jul 2013) * 347Double nicking by RNA-guided CRISPR Cas9 for enhanced genom...
Ran F. Ann et al. *Cell* (29 Aug 2013) * 339[Cited articles](#) [Citing patents](#)

Showing 1 to 20 of 2,578 patent families

Number of QNPL ▼**1. Protected guide RNAs (PGRNAs)**

Earliest priority date: 12 Dec 2014

[Feedback](#)

科学中的未知知识

- 通过文献中自然语言描述文本寻找科学问题?
- 不确定性知识、未知知识?

四、总结

临床医生应该意识到胃食管疾病与房颤之间的相互关系。鉴别并有效治疗 GERD 特别是食管炎,可能有助于减少房颤发病和症状,目前研究对房颤和 GERD 因果关系仍不确定,PPI 治疗是否减轻房颤仍有争议,还需要各项深入研究进一步探讨。

胃食管反流病与心房颤动关系的研究进展

肖蓉 李波

【关键词】 胃食管反流病; 心房颤动; 食管裂孔疝; 质

心房颤动(简称房颤)是临幊上常见的心律失常疾病,其发病率在普通成年人中占 3%,随着老年化的进展患病率仍在升高^[1]。据估计,到 2030 年欧洲房颤患者数量将由 1 400 万上升到 1 700 万,房颤使卒中风险增加 5 倍,死亡率增加 2 倍^[2]。胃食管反流病(GERD)是消化系统的常见疾病,患病率约为 2.5%~25.0%,亚洲较西方国家低,随着成人和儿童饮食方式的改变、超重及肥胖人群增多,GERD 逐渐呈现年轻化趋势^[3,4]。由于食管和左心房在解剖位置上临近,随着对 GERD 和房颤发病机制研究的深入,近年来发现两者之间可能存在一定关系,GERD 可能促进房颤的发生并且建议将房颤作为 GERD 的食管外症状^[5]。在 GERD 患者中使用质子泵抑制剂(PPI)后似乎可以使其房颤症状减轻,目前关于房颤、GERD 和 PPI 之间的关系仍存在争议,本文对 GERD 和房颤关系、GDED 触发房颤的作用机制及 PPI 与房颤的关系进行综述。

“不确定性”在科学知识的表达和交流中起重要的作用

- 表达未知、假设、推测、争议和矛盾
- 不确定性的突然增加可能意味着新范式的出现
- 通过识别出处于争议、矛盾、未知等不确定性状态、悬而未决的知识，对于引导科学研究方向、优化资源配置提供了一个决策支持工具

Table 1. Frequencies of the uncertain cue words.

Cue words	Frequency in all SemMedDB sentences	
Unknown lexicon		
uncertain*	227,014	(10.57‰)
unknown	525,536	(24.48‰)
Hedging lexicon		
maybe	10,286	(0.48‰)
may	5,946,955	(276.96‰)
might	949,536	(44.22‰)
possible	1,751,994	(81.59‰)
potential	2,879,336	(134.10‰)
seems	333,677	(15.54‰)
perhaps	84,058	(3.91‰)
likely	1,052,986	(49.04‰)
sometimes	119,942	(5.59‰)
Conflicting lexicon		
conflict*	175,516	(8.17‰)
contradict*	46,639	(2.17‰)
controversy*	208,264	(9.70‰)
debate*	122,332	(5.70‰)
no consensus	17,907	(0.83‰)
questionable*	21,159	(0.99‰)
refute*	9,710	(0.45‰)

“*” stands for all of the possible derivations of the word.

小结

- 搜索引擎精准检索
- 信息自动推送，提高信息获取效率
- 关键词检索（matching）：local perspective，依赖于标注质量
- 引文检索（Citing）：代际思维、自然而然的秩序、有利于学科交叉
- 文献前后端信息（资助、专利）检索，全域信息获取
- 科学前沿信息：不确定性信息的识别和获取

谢谢大家！



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NATIONAL INSTITUTE OF HEALTH
DATA SCIENCE AT PEKING UNIVERSITY