

# ⚡ SUPERCHARGE ⚡ YOUR LIT REVIEW WORKFLOW WITH 😱 ~AI TOOLS~ 😱

Zane Billings

2024-10-03

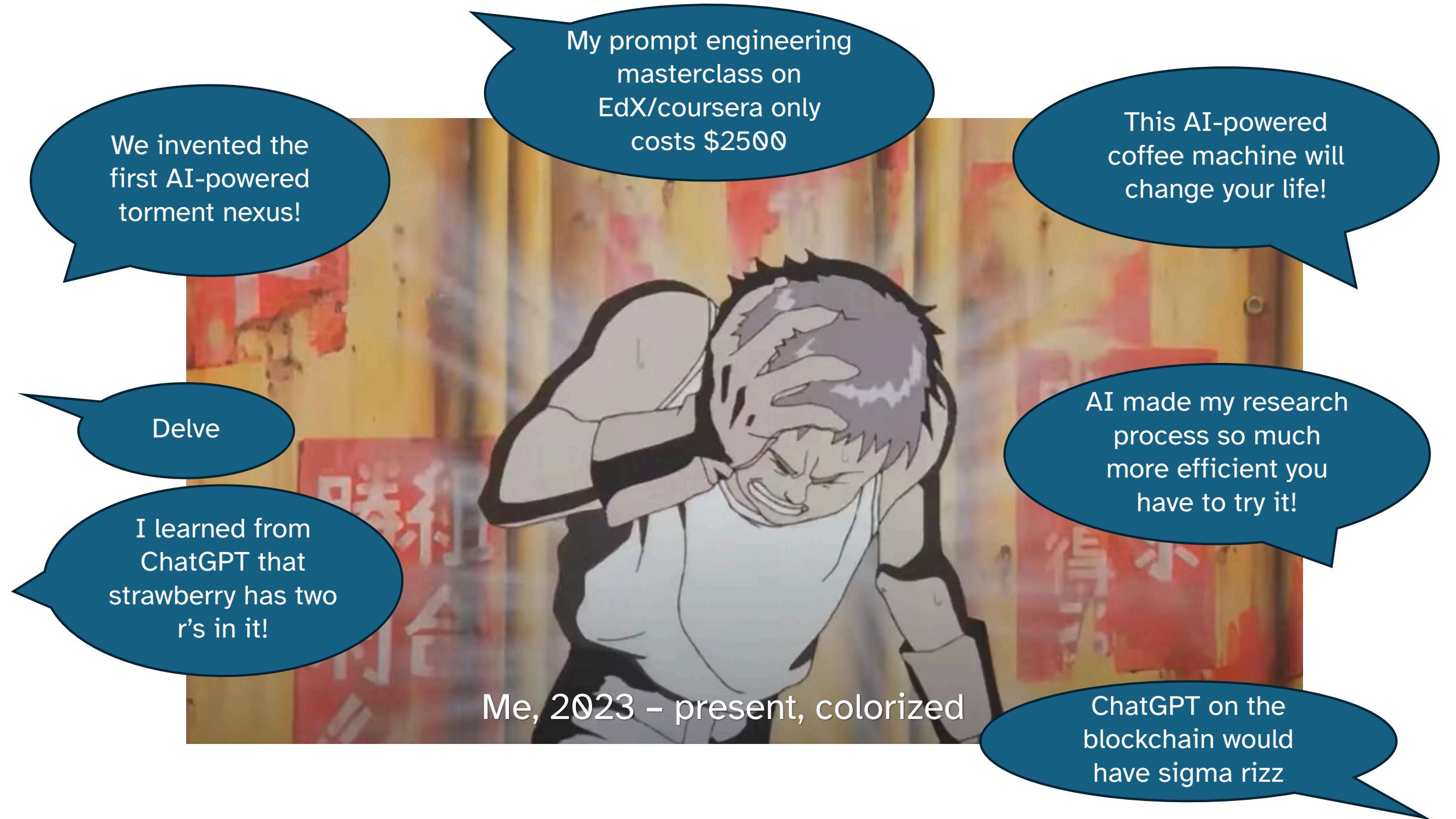
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# Outline

1. My journey as an AI hater
2. Zotero
3. AI tools that are actually useful
4. AI tools tier list
5. End of presentation

My journey as an AI hater



We invented the first AI-powered torment nexus!

Delve

I learned from ChatGPT that strawberry has two r's in it!

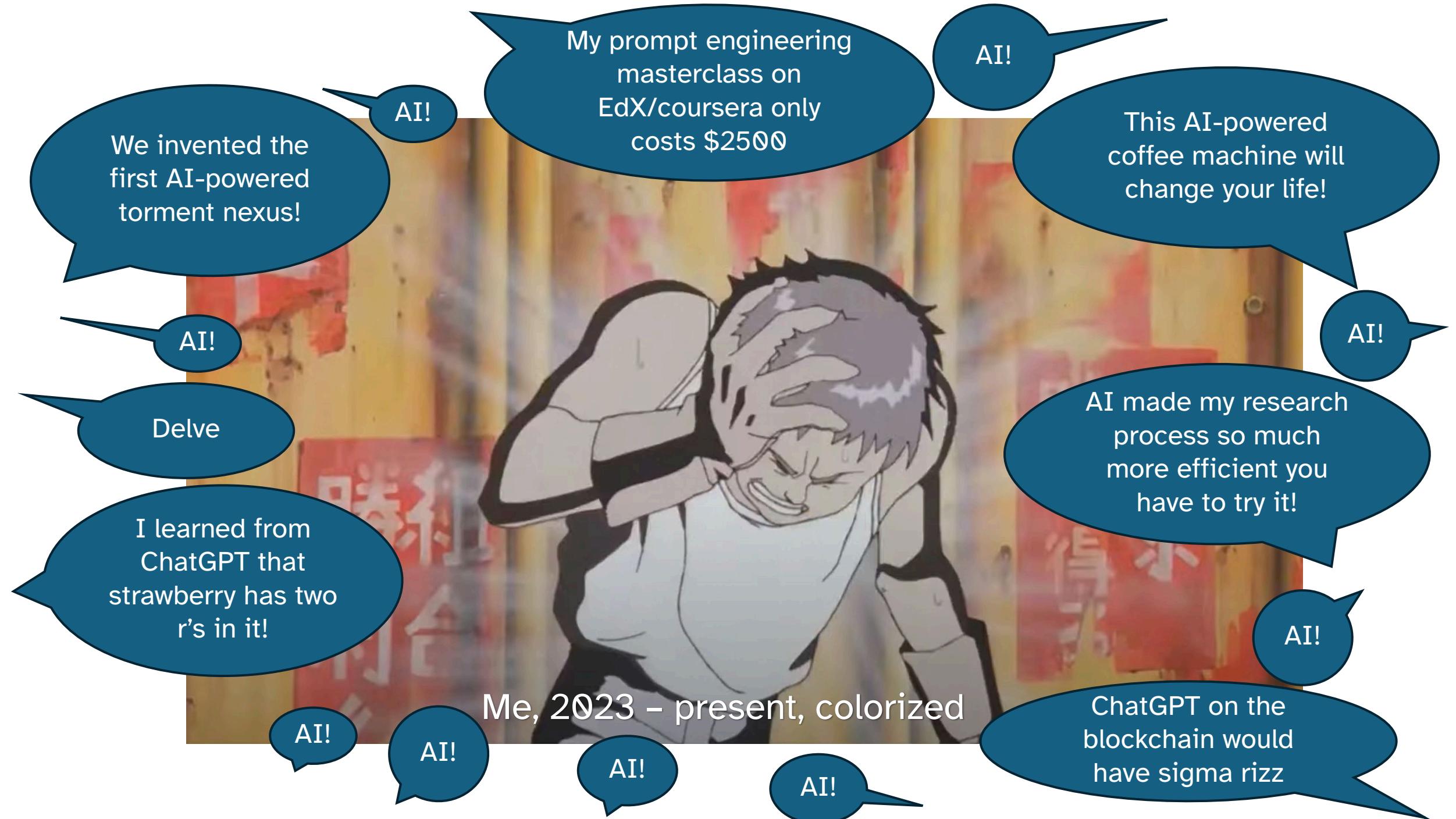
My prompt engineering masterclass on EdX/coursera only costs \$2500

This AI-powered coffee machine will change your life!

AI made my research process so much more efficient you have to try it!

ChatGPT on the blockchain would have sigma rizz

Me, 2023 – present, colorized





AI?

**RESEARCHERS WHEN  
THEY DISAGREE WITH  
A SINGLE VARIABLE  
IN YOUR REGRESSION MODEL**



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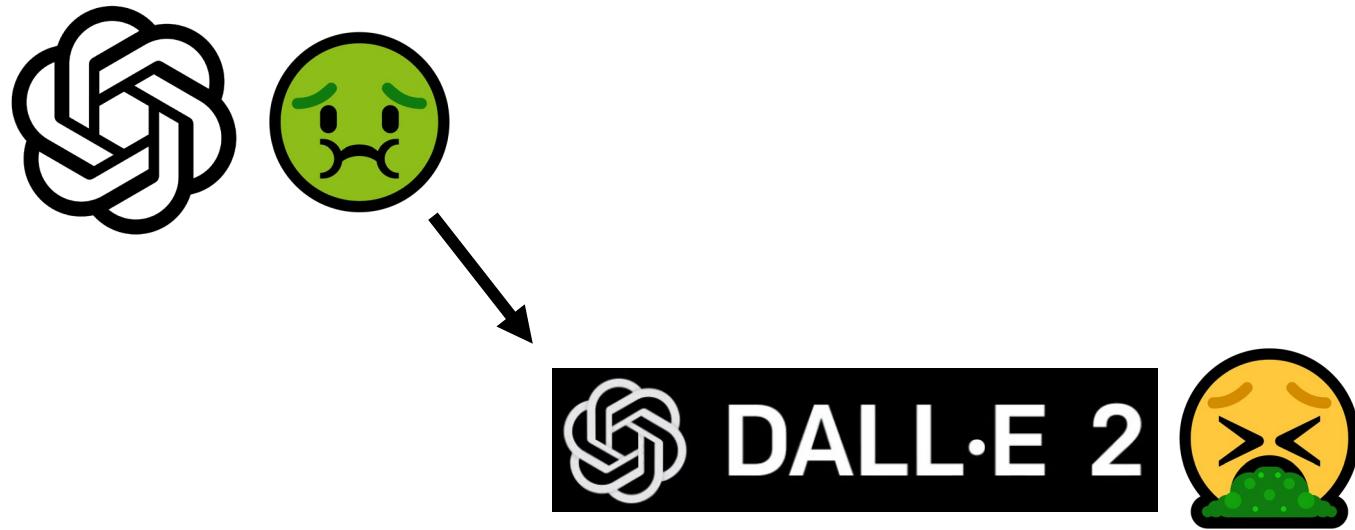
**RESEARCHERS  
WHEN YOU SAY  
YOU USED AI MODELS**



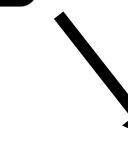
# My journey as an AI hater



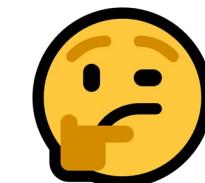
# My journey as an AI hater



# My journey as an AI hater



**ResearchRabbit**



# AI ethics

# AI ethics

- LLMs like ChatGPT, etc., **are trained on stolen material.** Using LLMs to write scientific papers is plagiarism.

# AI ethics

- LLMs like ChatGPT, etc., **are trained on stolen material.** Using LLMs to write scientific papers is plagiarism.
- All AI tools are developed using data from the internet and **results must be critically evaluated for systemic bias.**

**Writing = Thinking**

# **Writing = Thinking**

AI has benefits in speeding up repetitive tasks, but you should never let any tool replace the process of writing and discovery for you.

# Tools for lit review

# Zotero intermission (not AI)



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

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Influenza

My Library blogs Epidemiology CDRs Immunology Influenza antigenic distance clinical diagnostics Flu Burden Meta Methodology Misc/Old searches-sort sort these to-read My Publications Duplicate Items Unfiled Items Trash Group Libraries Bayesian-Censoring Flu-Vaccine-Immunology FluA\_Vac\_HDSD handelgroup AI-ML-with-mechanistic-models antibody-decay-kinetics censored-missing-data-approach... CoP - flu CoP-VE data-source-papers cowling-data DRIVE-data

\* human norovirus \*antibody \*Antibody Formation \*Blood Group Antigens \*booster \*histo-blood group antigen \*human intestinal enteroids \*immunogenicity \*neutralization \*norovirus \*Norovirus \*Norovirus/immunology \*persistence \*randomized controlled trial \*safety \*tolerability

Filter Tags

All Fields & Tags

Title	Creator	Year	Date Added	Cit...
> Preexisting subtype immunodominance shapes memory B cell recall responses to influenza A virus	Abreu et al.	2021	6/9/2021, 4:06:54 PM	ab...
> Influenza Virus: Tracking, Predicting, and Forecasting	Ali and Cowling	2021	12/6/2022, 8:51:27 AM	ali...
> Human Influenza A Virus Hemagglutinin Glycan Evolution Follows a Temporal Hierarchy	Altman et al.	2019	4/11/2023, 8:51:50 AM	alt...
> Defining and Manipulating B Cell Immunodominance Hierarchies to Elicit Broadly Protective Responses	Amitai et al.	2020	4/11/2023, 8:51:50 AM	a...
> Immune history profoundly affects broadly protective B cell responses to influenza A virus	Andrews et al.	2015	4/11/2023, 8:52:42 AM	an...
> A single residue in influenza virus H2 hemagglutinin enhances the breadth of cross-reactive B cell responses	Andrews et al.	2022	4/11/2023, 8:51:50 AM	an...
> Original antigenic sin priming of influenza virus hemagglutinin stalk antibodies	Arevalo et al.	2020	4/11/2023, 8:51:50 AM	ar...
> Earliest infections predict the age distribution of seasonal influenza A cases	Arevalo et al.	2020	4/11/2023, 8:51:14 AM	ar...
> Rapid Responses to 2 Virus-Like Particle Norovirus Vaccine Candidate Formulations	Atmar et al.	2016	12/10/2021, 12:24:38 AM	at...
> Persistence of Antibodies to 2 Virus-Like Particle Norovirus Vaccine Candidates	Atmar et al.	2019	12/10/2021, 12:23:46 AM	at...
> An Exploratory Study of the Salivary Immunoglobulin A Responses to 1 Dose of Inactivated Influenza Vaccine	Atmar et al.	2019	12/10/2021, 12:25:21 AM	at...
> Comparison of Microneutralization and Histo-Blood Group Antigen-Blocking Properties of Influenza A and B Viral Hemagglutinins	Attias et al.	2020	12/10/2021, 12:25:32 AM	at...
> Antibody response to the BNT162b2 vaccine in maintenance hemodialysis patients	Bangaru et al.	2021	4/11/2023, 8:51:50 AM	att...
> Recognition of influenza H3N2 variant virus by human neutralizing antibodies	Belongia et al.	2016	4/11/2023, 8:51:50 AM	ba...
> Variable influenza vaccine effectiveness by subtype: a systematic review and meta-analysis	Benest et al.	2016	4/11/2023, 8:53:23 AM	be...
> Optimising Vaccine Dose in Inoculation against SARS-CoV-2, a Multi-Factorial Randomised Controlled Trial	Bernstein et al.	2021	4/11/2023, 8:51:50 AM	be...
> Immunogenicity of chimeric haemagglutinin-based, universal influenza virus vaccines	Bernstein et al.	2019	4/11/2023, 8:52:42 AM	be...
> Evaluating reduced effectiveness after repeat influenza vaccination while co-circulating SARS-CoV-2	Bi et al.	2023	4/11/2023, 9:01:08 AM	bi...
> Influenza surveillance using data from a telemedicine centre	Blozik et al.	2012	11/2/2023, 10:02:36 PM	bl...
> Prevalence of Antibodies against Seasonal Influenza A and B Viruses in Cambodia	Bodewes et al.	2011	4/11/2023, 8:51:14 AM	bo...
> Seasonal influenza vaccine in immunocompromised persons	Bosaeed and Ku...	2018	4/11/2023, 8:49:04 AM	bo...
> Variation in the human immune system is largely driven by non-heritable individual differences	Brodin et al.	2015	4/11/2023, 8:51:03 AM	br...
> A recommended numbering scheme for influenza A HA subtypes	Burke and Smith	2014	4/11/2023, 8:51:50 AM	bu...
> Structural Consequences of Antigenic Variants of Human A/H3N2 Influenza Viruses	Burke	2023	11/2/2023, 10:30:37 PM	bu...
> Impact of age and pre-existing immunity on the induction of human antibody responses to influenza A virus	Carlock et al.	2019	6/9/2021, 4:06:14 PM	ca...
> Safety and immunogenicity of investigational seasonal influenza hemagglutinin vaccines	Carter et al.	2019	4/11/2023, 8:52:24 AM	ca...
> National, Regional, and State Level Outpatient Illness and Viral Surveillance	CDC	2021	6/25/2021, 5:11:19 PM	flu...
> H5N1 Update: Two Human H5N1 Cases in Cambodia	CDC	2023	4/11/2023, 8:51:50 AM	cd...
> Effectiveness of 2008-09 trivalent influenza vaccine against 2009 pandemic influenza A(H1N1) virus	Centers for Dise...	2009	11/2/2023, 10:30:34 PM	ce...
> Should Sex Be Considered an Effect Modifier in the Evaluation of Influenza Vaccines?	Chambers et al.	2018	4/11/2023, 8:51:03 AM	ch...
> Safety and immunogenicity of high-dose quadrivalent influenza vaccine in healthy adults	Chang et al.	2019	4/11/2023, 8:49:04 AM	ch...
> Influenza Infection in Humans Induces Broadly Cross-Reactive and Protective T Cells	Chen et al.	2018	8/15/2022, 8:50:09 AM	ch...
> Influenza and COVID-19: What does co-existence mean?	Chotpitayasuno...	2021	11/2/2023, 10:02:36 PM	ch...
> Towards identification of immune and genetic correlates of severe influenza A virus infection	Clemens et al.	2016	8/2/2021, 10:44:07 AM	cle...
> Repeated Vaccination May Protect Children From Influenza Infection	Cobey	2018	4/11/2023, 9:01:08 AM	co...
> Immune history and influenza virus susceptibility	Cobey and Hens...	2017	4/11/2023, 8:52:42 AM	co...
> Immunogenicity of a half-dose of adjuvanted 2009 pandemic H1N1 influenza A virus vaccine	Coleman et al.	2012	4/11/2023, 8:49:04 AM	col...
> A new approach to estimate vaccine efficacy based on immunogenicity data	Coudeville et al.	2010	11/2/2023, 10:30:34 PM	co...
> Relationship between haemagglutination-inhibiting antibody titres and clinical outcomes	Coudeville et al.	2010		
> Airborne transmission of influenza: implications for control in healthcare settings	Cowling	2012		
> Comparative epidemiology of pandemic and seasonal influenza A in households	Cowling et al.	2010		

251 items in this view

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

# Zotero intermission (not AI)



- The most important tool for any lit review is your **reference manager**.
- **Zotero** is free, open-source, and works with open data formats.
- Contains tools for importing search results, deduplication, and exporting bibliographies.

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- **Zotero** is free, open-source, and works with open data formats.
- Contains tools for importing search results, deduplication, and exporting bibliographies.
- Web capture, Word integration, BibTeX support

1.

The screenshot shows a search result for a pharmacokinetics article. At the top, there's a navigation bar with a 'Log in' button and a dropdown menu set to 'My Library'. Below the header, the date '15, 2024' and links to 'Learn More' or 'Try it out now' are visible. The main content area includes a 'Search in PMC' bar, an 'Advanced Search' link, and a 'User Guide'. The article title is 'Approaches to handling missing or "problematic" pharmacology data: Pharmacokinetics'. It's from 'CPT Pharmacomet Syst Pharmacol.' (2021;10(4):291-308). The PDF file size is 979K. Below the title, there's a notice about NLM database inclusion and a 'Notice' link. The abstract discusses pharmacokinetics and mentions authors like Dauki, Ibrahim, and Irby. There are sections for 'OTHER FORMATS' (PDF), 'ACTIONS' (Cite, Collections), 'SHARE' (Twitter, Facebook, LinkedIn), and 'RESOURCES' (Similar articles, Cited by other articles, Links to NCBI Databases).

2.

The screenshot shows the Zotero application interface. The top menu bar includes 'Add/Edit Citation', 'Bibliography', 'Insert Note', 'Refresh', and 'Unlink Citations'. Below the menu, a citation card for 'Irby et al., 2021' is displayed. The text of the citation is identical to the one shown in the PMC screenshot above. The Zotero interface has a dark theme with red highlights for certain elements.

3.

**Lorem ipsum odor amet, consectetuer adipiscing elit. Donec sapien suscipit suscipit lectus orci massa erat. Feugiat commodo arcu aliquet nam, ullamcorper feugiat orci rhoncus. Viverra penatibus porta dolor habitasse ex at taciti consequat integer. Scelerisque placerat sit euismod dictum euismod nam et. Euismod netus adipiscing dui erat senectus cubilia dapibus parturient molestie. Malesuada sit pulvinar vivamus mi pellentesque. Dignissim mollis facilisi gravida facilisi sagittis neque facilisi semper. Litora ridiculus phasellus enim morbi platea libero<sup>1</sup>.**

4.

1. Irby DJ, Ibrahim ME, Dauki AM, et al. Approaches to handling missing or "problematic" pharmacology data: Pharmacokinetics. *CPT Pharmacomet Syst Pharmacol.* 2021;10(4):291-308. doi:10.1002/psp4.12611

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

# ResearchRabbit



<https://www.researchrabbit.ai/>



# ResearchRabbit

- Free web-based tool for graphically representing literature collections and finding related papers

<https://www.researchrabbit.ai/>

# ResearchRabbit



Filter Custom

Abstracts  Comments

Select None Select All

**Infection block hypothesis**

Thompson Cowling 2022 0  
How repeated influenza vaccination effects might apply to COVID-19 vaccines  
The Lancet Respiratory Medicine 2022 0  
No PDF

Many of the current questions on the public health and research aspects of the future of COVID-19 vaccines and vaccine strategies have been topics of research and debate in the influenza vaccine literature for decades. Here, we describe how the lessons learned from the study of repeated influenza vaccinations might apply to the evaluation of COVID-19 vaccines, and the prospect of future seasonal or periodic booster vaccinations.

Comment

2017 204  
Repeated annual influenza vaccination and vaccine effectiveness: review of evidence  
Expert Review of Vaccines

2010 284  
Association between the 2008–09 Seasonal Influenza Vaccine and Pandemic H1N1 Illness during Spring–Summer 2009: Four Observational Studies from Canada  
PLOS Medicine

2010 13  
How Did the 2008–2009 Seasonal Influenza Vaccine Affect the Pandemic?  
Clinical Infectious Diseases

2010 145  
Protective Efficacy of Seasonal Influenza Vaccination against Seasonal and Pandemic Influenza Virus Infection during 2009 in Hong Kong  
Cowling Leung

**1 selected paper**

Mark G Thompson Benjamin J Cowling 2022 0  
How repeated influenza vaccination effects might apply to COVID-19 vaccines  
The Lancet Respiratory Medicine 2022 0  
No PDF

Many of the current questions on the public health and research aspects of the future of COVID-19 vaccines and vaccine strategies have been topics of research and debate in the influenza vaccine literature for decades. Here, we describe how the lessons learned from the study of repeated influenza vaccinations might apply to the evaluation of COVID-19 vaccines, and the prospect of future seasonal or periodic booster vaccinations.

Comment

**Similar Work**

Filter Relevance

Abstracts  Comments

Select All

Kitikoon ... Vincent 2014 4  
Antibody secreting cell assay for influenza A virus in swine.  
Methods of Molecular Biology

Gg ... Fodor 2001 99  
The predicted antigenicity of the haemagglutinin of the 1918 Spanish influenza pandemic suggests an avian origin  
Philosophical Transactions of the Royal Society B

Krause ... Crowe 2014 10  
Committing the Oldest Sins in the Newest Kind of Ways—Antibodies Targeting the Influenza Virus Type A Hemagglutinin Globular Head  
Microbiology spectrum

Du ... Bj 2008 38  
Development of subunit vaccines against severe acute respiratory syndrome  
Drugs of Today

Dormitzer ... Rappuoli 2011 156  
Influenza vaccine immunology.  
Immunological Reviews

Kilbourne ... Sande 1968 45  
Antibody response in man to influenza virus neuraminidase following influenza.

**Connections between your collection and 50 papers**

Graph Type Network Timeline Labels First Author Last Author

Filter these items

**Network**

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Add Papers

Connections Click to Show Sync to Zotero

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# ResearchRabbit

- Free web-based tool for graphically representing literature collections and finding related papers
- Bidirectional communication with Zotero

<https://www.researchrabbit.ai/>



# ResearchRabbit

The screenshot shows the ResearchRabbit application interface. On the left, there's a sidebar with a red header bar containing a 'Z+' icon and 'Import Zotero Collection'. Below this are sections for 'Uncategorized' and 'Shared with Me', each listing various items like 'meta', 'antigenic distance', 'Infection block hypothesis', 'Proposal', and 'Ten simple rules to make your publication look better.' In the center, a 'meta' collection is selected in Zotero. The right side displays a list of items from this collection, including:

Title	Creator	Date Added	Citation key
Ten simple r...	Baillie et al.	2...	baillie2022
Writing a sci...	Ecarnot et al.	2...	ecarnot2015
Who is in this stu...	Eleanor Hayes-Larson et al.	2...	eleanorhayes-larso...
The Strength...	Erik von Elm et al.	2...	erikvonelm2007
Statistics and...	Freedman	1...	freedman1985
Ten simple r...	Friederike Ehrhart et al.	2...	friederikeehrhart20...
Strengthenin...	Jan P. Vandenbroucke et al.	2...	janvandenbroucke...
Graphics, Tabl...	Lauren E. Franzblau et al.	2...	laurenefranzblau20...
Graphics and...	Maarten Boers and Boers	2...	maartenboers2018
What's wron...	McIver	2...	mciver2024
Ten simple r...	Méndez	2...	mendez2018
Rewriting res...	Muff et al.	2...	muff2022
A community...	Parsons et al.	2...	parsons2022
Rethinking Ta...	Ralph I. Horwitz et al.	2...	ralphihorwitz2021
Presenting d...	Rodrigo Pereira Duquia et al.	2...	rodrigopereiraduqu...
The importa...	Schwartz	2...	schwartz2008
The importa...	Schwartz	2...	schwartz2015
The importa...	Schwartz	2...	schwartz2022

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- Visualize references and citations of a given paper or all papers in collection (like Web of Science but easier to use)

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# ResearchRabbit



**1 selected paper**

Hailiang Sun, Xiu-Feng Wan  
Using Sequence Data To Infer the Antigenicity of Influenza Virus  
Mbio 2013 l 84  
[1 PDF](#)

**ABSTRACT** The efficacy of current influenza vaccines requires a close antigenic match between circulating and vaccine strains. As such, timely identification of emerging influenza virus antigenic variants is central to the success of influenza vaccination programs. Empirical methods to determine influenza virus antigenic properties are time-consuming and mid-throughput and require live viruses. Here, we present a novel, experimentally validated, computational method to predict influenza virus antigenicity on the basis of hemagglutinin (HA) sequence. This method integrates a bootstrapped ridge regression with antigenic mapping to quantify antigenic distances by using influenza HA1 sequences. Our method was applied to H3N2 seasonal influenza viruses and identified the 13 previously recognized H3N2 antigenic clusters and the antigenic drift event of 2009 that led to a change of the H3N2 vaccine strain. IMP-ORF analysis implies a novel method for quantifying antigenic distance and identifying antigenic variants using sequences alone. This method will be useful in influenza vaccine strain selection by significantly reducing the human labor efforts for serological characterization and will increase the likelihood of correct influenza vaccine candidate selection.

**All References**

Connections between your collection and 48 papers

Graph Type: Network Timeline Labels: First Author Last Author

Remove from: antigenic distance Add to Other Collection

Similar Work 906 All References 53 All Citations 82

MECHANISM OF ANTIGENIC VARIATION IN AN INDIVIDUAL EPITOPE ON INFLUENZA VIRUS N9 NEURAMINIDASE  
Journal of Virology

Harper, Webster 1990 l 60

Prevention and control of influenza : recommendations of the Advisory Committee on Immunization Practices (ACIP)  
Morbidity and Mortality Weekly Report

Harper, Bridges 2004 l 5900

Scoring residue conservation.  
Proteins

Jin, Kemble 2005 l 108

Two residues in the hemagglutinin of A/Fujian/41/02-like influenza viruses are responsible for antigenic drift from A/Panama/2007/99.  
Virology

Ampofo, Zhang 2013 l 76

Improving influenza vaccine virus selection: Report of a WHO informal consultation held at WHO headquarters, Geneva, Switzerland, 14-16 June 2010  
Influenza and Other Respiratory Viruses

Huang, Yang 2009 l 42

Explore Papers: Similar Work, All References, All Citations

Explore People: These Authors, Suggested Authors

Explore Other Content: Linked Content

Export Papers: BibTeX, RIS, CSV

Public Collection: Shareable Link, Copy

Collaborators: Edit

Email Updates: Edit

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**All Citations**

Connections between your collection and 48 papers

Graph Type: Network Timeline Labels: First Author Last Author

Remove from: antigenic distance Add to Other Collection

Similar Work 906 All References 53 All Citations 82

Models for predicting the evolution of influenza to inform vaccine strain selection  
Human Vaccines & Immunotherapeutics

Anderson, Topham 2018 l 46

Antigenic cartography of H1N1 influenza viruses using sequence-based antigenic distance calculation.  
BMC Bioinformatics

Lee, Bloom 2018 l 11

Deep mutational scanning of hemagglutinin helps predict evolutionary fates of human H3N2 influenza variants  
bioRxiv

Han, Wan 2019 l 9

Graph-guided multi-task sparse learning model: a method for identifying antigenic variants of influenza A(H3N2) virus.  
Bioinformatics

Abentz, Vincent 2018 l 11

Comparison of Adjuvanted-Whole Inactivated Virus and Live-Attenuated Virus Vaccines against Challenge with Contemporary, Antigenically Distinct H3N2 Influenza A Viruses.  
Journal of Virology

Explore Papers: BibTeX, RIS, CSV

Explore People: These Authors, Suggested Authors

Explore Other Content: Linked Content

Export Papers: BibTeX, RIS, CSV

Public Collection: Shareable Link, Copy

Collaborators: Edit

Email Updates: Edit

<https://www.researchrabit.ai/>



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- Visualize references and citations of a given paper or all papers in collection (like Web of Science but easier to use)
- AI-powered recommendations for similar papers

# ResearchRabbit



**1 selected paper**

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[PDF](#)

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**IMPORTANCE** This report supplies a novel method for quantifying antigenic distance and identifying antigenic variants using sequences alone. This method will be useful in influenza vaccine strain selection by significantly reducing the human labor efforts for serological characterization and will increase the likelihood of correct influenza vaccine candidate selection.

**Similar Work**

Remove from:  antigenic distance  
 Add to Other Collection

EXPLORE PAPERS

- Similar Work 906
- All References 53
- All Citations 82

EXPLORE PEOPLE

- These Authors 17
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PUBLIC COLLECTION

SHAREABLE LINK

COLLABORATORS

EMAIL UPDATES

**Similar Work**

Relevance

Abstracts  Comments

Select All

Smith ... Fouchier 2004 1578  
Mapping the Antigenic and Genetic Evolution of Influenza Virus  
Science

Koel ... Smith 2013 495  
Substitutions near the receptor binding site determine major antigenic change during influenza virus evolution.  
Science

Bao ... Lipman 2008 938  
The influenza virus resource at the National Center for Biotechnology Information.  
Journal of Virology

Ia ... Cox 1990 548  
Structural basis of immune recognition of influenza virus hemagglutinin.  
Annual Review of Immunology

Huang ... Yang 2009 42  
Co-evolution positions and rules for antigenic variants of human influenza A/H3N2 viruses  
BMC Bioinformatics

Wiley ... Skehel 1981 1572  
Structural identification of the antibody-binding sites of Hong Kong influenza haemagglutinin and their

**Connections between your collection and 47 papers**

Graph Type: Network Timeline Labels: First Author Last Author

Filter these items

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**Explore People**

- These Authors 568
- Suggested Authors 1159

**Explore Other Content**

- Linked Content 384

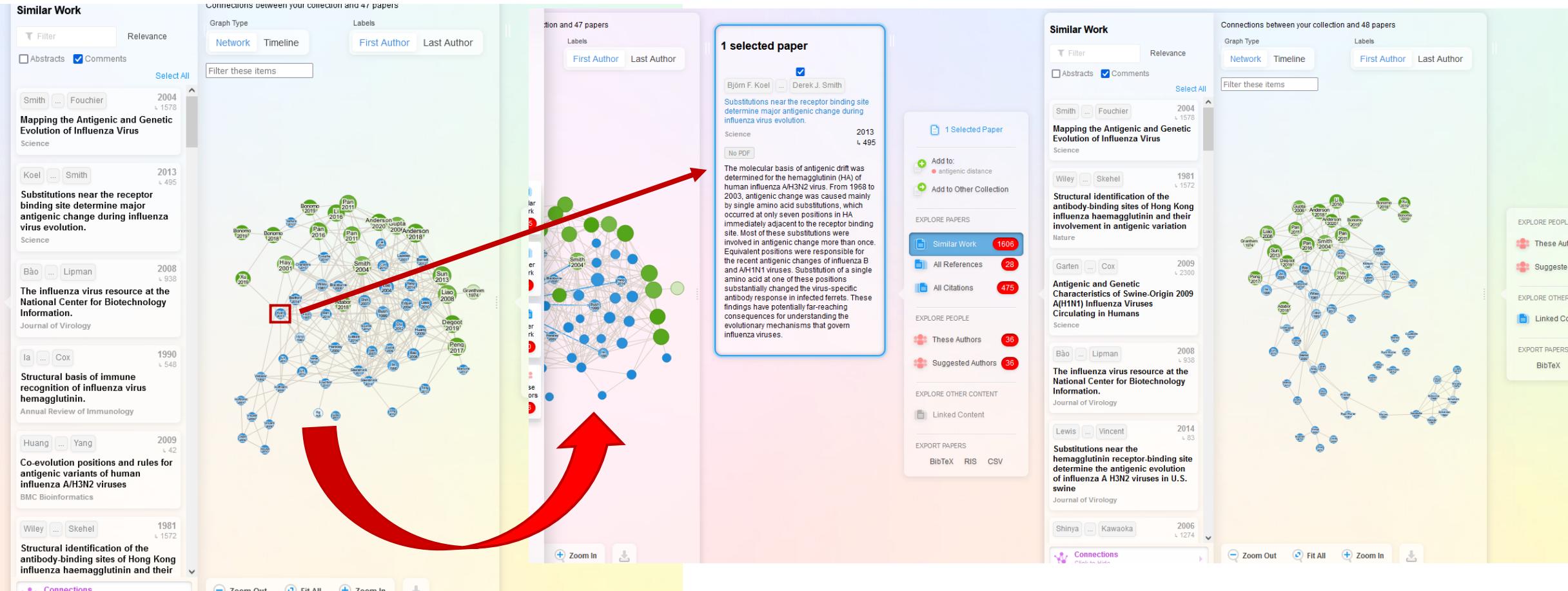
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- BibTeX
- RIS
- CSV

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# ResearchRabbit



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# Elicit

- AI-powered search engine that uses NLP to parse search queries and find papers.

<https://www.elicit.com/>

# Elicit

🔍 Find papers

Does vaccine mismatch affect vaccine efficacy of the seasonal influenza vaccine?

→

📤 Extract data from PDFs

💡 List of concepts



# Elicit

- AI-powered search engine that uses NLP to parse search queries and find papers.
- Searches full text when available or abstract to generate summaries. Info is drawn only from paper to prevent certain types of hallucinations.

<https://www.elicit.com/>

# Elicit

Paper	Abstract summary
<input type="checkbox"/> Comparing influenza vaccine efficacy against mismatched and matched strains: a systematic review and meta-analysis  A. Tricco +8 BMC Medicine  2013 · 335 citations <a href="#">PDF</a> <a href="#">DOI</a>	Influenza vaccines can provide cross-protection against non-matching circulating strains, though vaccine efficacy is higher when the vaccine matches the circulating strains.
<input type="checkbox"/> Change in the efficacy of influenza vaccination after repeated inoculation under antigenic mismatch: A systematic review and meta-analysis.  Nobuhisa Morimoto +1 Vaccine  2018 · 24 citations <a href="#">DOI</a>	Repeated influenza vaccination reduces vaccine efficacy against mismatched strains in children, but not against matched strains.
<input type="checkbox"/> Influenza: Can we cope better with the unpredictable?  Gael Dos Santos +2 Human Vaccines & Immunotherapeutics  2015 · 40 citations <a href="#">PDF</a> <a href="#">DOI</a>	Vaccine mismatch can impact seasonal influenza vaccine efficacy, but vaccination is still recommended as the preferred means of protection.
<input type="checkbox"/> Immune History and Influenza Vaccine Effectiveness  J. Lewnard +1 Vaccines  2018 · 154 citations <a href="#">PDF</a> <a href="#">DOI</a>	Vaccine mismatch is not the only factor affecting seasonal influenza vaccine efficacy, as immune history also plays an important role.
<input type="checkbox"/> Impact of influenza B lineage-level mismatch between trivalent seasonal influenza vaccines and circulating viruses, 1999–2012.  T. Heikkinen +2	Vaccine mismatch with circulating influenza B lineages has a substantial population-level impact, especially in children and adolescents.

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- AI-powered search engine that uses NLP to parse search queries and find papers.
- Searches full text when available or abstract to generate summaries. Info is drawn only from paper to prevent certain types of hallucinations.
- Attempts to find a consensus between the most relevant articles.

# Elicit

## Vaccine Mismatch and Efficacy

Q Does vaccine mismatch affect vaccine efficacy of the seasonal influenza vaccine?

Summary of top 4 papers

Copy

Vaccine mismatch can significantly affect the efficacy of seasonal influenza vaccines, but cross-protection against mismatched strains is still possible. A meta-analysis found that live-attenuated influenza vaccines (LAIV) and trivalent inactivated vaccines (TIV) provided protection against both matched and mismatched strains in children and adults, respectively, although efficacy was generally lower for mismatched strains ([Tricco et al., 2013](#)). Another study revealed that repeated vaccination in children may reduce vaccine efficacy against mismatched strains compared to single-season vaccination ([Morimoto & Takeishi, 2018](#)). The unpredictability of influenza virus circulation and strain selection challenges contribute to variable vaccine effectiveness across seasons and regions ([Dos Santos et al., 2015](#)). Immune history also plays a role in vaccine effectiveness, with factors such as age group and recent vaccination status influencing outcomes ([Lewnard & Cobey, 2018](#)). Despite these challenges, vaccination remains the preferred method for protection against influenza and its complications.

You need to review **everything** that Elicit says. Use it as a search tool, not a skip-my-paper-reading tool.

# Litsearchr



<https://elizagrames.github.io/litsearchr/>

# Litsearchr



- R package that analyses a corpus of imported references and suggests search strings.

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- R package that analyses a corpus of imported references and suggests search strings.
- More for systematic reviews than casual.

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# Litsearchr



- R package that analyses a corpus of imported references and suggests search strings.
- More for systematic reviews than casual.
- Allows for iterative refinement of search strategies with quantitative metrics.

<https://elizagrames.github.io/litsearchr/>

# Litsearchr



RESEARCH ARTICLE | Free Access

## An automated approach to identifying search terms for systematic reviews using keyword co-occurrence networks

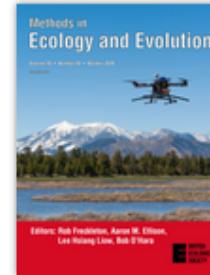
Eliza M. Grames Andrew N. Stillman, Morgan W. Tingley, Chris S. Elphick

First published: 20 July 2019 | <https://doi.org/10.1111/2041-210X.13268> | Citations: 154

SECTIONS

PDF TOOLS SHARE

### Abstract



Volume 10, Issue 10  
October 2019  
Pages 1645-1654

Figures References Related Information

### Recommended

[Facilitating systematic reviews, data extraction and meta-analysis with the METAGEAR package for R](#)

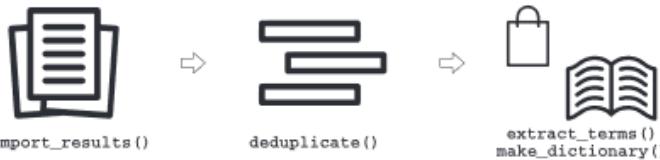
Marc J. Lajeunesse

<https://besjournals.onlinelibrary.wiley.com/doi/10.1111/2041-210X.13268>

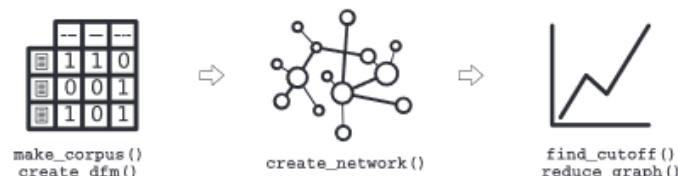
<https://elizagrames.github.io/litsearchr/>



1. Research team writes a naïve search to capture a set of highly relevant articles. The naïve search should be conducted in at least two supported databases and results should be exported per litsearchr guidelines.



2. litsearchr imports search results in a standardized format and removes duplicates. Each article is turned into a "bag of words" before keywords are extracted from the full set of articles to create a dictionary of possible search terms.



3. litsearchr creates a document-feature matrix using each possible term from the dictionary as features; this matrix becomes a keyword co-occurrence network. litsearchr fits a model to the network to find a cutoff in keyword importance.



4. litsearchr suggests possible search terms central to the topic of the review. The research team manually considers these keywords and sorts them into concept groups. This process can be repeated with terms that share a stem.



5. litsearchr removes redundant terms and then translates terms into user-specified languages. It then writes Boolean search strings for each language which the review team uses to conduct searches.

## Multiple tutorials are available:

- [https://luketudge.github.io/litsearchr-tutorial/litsearchr\\_tutorial.html](https://luketudge.github.io/litsearchr-tutorial/litsearchr_tutorial.html)
- [https://elizagrames.github.io/litsearchr/litsearchr\\_vignette.html](https://elizagrames.github.io/litsearchr/litsearchr_vignette.html)

# Litsearchr



- R package that analyses a corpus of imported references and suggests search strings.
- More for systematic reviews than casual.
- Allows for iterative refinement of search strategies with quantitative metrics.
- Part of a network of R packages for systematic reviews and evidence synthesis.

<https://elizagrames.github.io/litsearchr/>

# Litsearchr-verse



## Related Tools and Resources

### **synthesisr** logo **synthesisr**

Import, assemble, and deduplicate bibliographic data stored as RIS or BibTex formatted text files.



### **metaDigitise**

High-throughput, reproducible extraction of data from figures.

### **revtools** logo **revtools**

Article screening for evidence synthesis using manual or visual methods.



### **robvis**

Create publication quality risk-of-bias assessment figures.



### **topicTagger**

Tag documents with meta-data and based on user-defined ontologies or topic groups.



### Evidence Synthesis Hackathon

A series to bring together interested researchers, practitioners and coders to discuss and develop new Open Source technologies for evidence synthesis applications.

# Alternatives or whatever

- Similar to ResearchRabbit
  - Connected Papers: <https://www.connectedpapers.com/>
  - LitMaps: <https://www.litmaps.com/>
- Similar to Elicit
  - OpenRead: <https://www.openread.academy/>
  - Semantic Scholar: <https://www.semanticscholar.org/>
  - Consensus: <https://consensus.app/search/>
- There's definitely more of both. Beware of pricing scams.
- Litsearchr exists in an ecosystem of topic modeling for systematic reviews, which seems promising over manual search.

# AI tools tier list (for lit review)

<b>GOATed w/ the sauce</b>	ResearchRabbit, ConnectedPapers, etc.
<b>EGOT coded</b>	Elicit, Semantic Scholar
<b>A glass of warm milk</b>	Litsearchr (good for specific tasks)
<b>Full buffet</b>	ChatGPT, Gemini, Bard, Claude, etc.
<b>FLOP BEHAVIOR!!!!</b>	Any service that does the same thing as Zotero, ResearchRabbit, or Semantic Scholar but makes you pay for it. That's a scam

Bonus ranking: 99% of productivity tools are giving Andy's boyfriend from the Devil Wears Prada

“No, the menace of AI is that it attacks where modern minds are weakest, where we have abandoned our protective armor of superstition and have no substitute defense.

Shirley Jackson, if she wrote *The Haunting of Hill House* last year, probably

# Helpful references

- <https://www.techpolicy.press/challenging-the-myths-of-generative-ai/>
- <https://ludic.mataroa.blog/blog/i-will-fucking-piledrive-you-if-you-mention-ai-again/> (CW: language)
- <https://dl.acm.org/doi/10.1145/3442188.3445922>
- <https://americanlibrariesmagazine.org/2016/05/31/why-sci-hub-matters/>
- <https://www.youtube.com/watch?v=0vZGAUs-dZg>