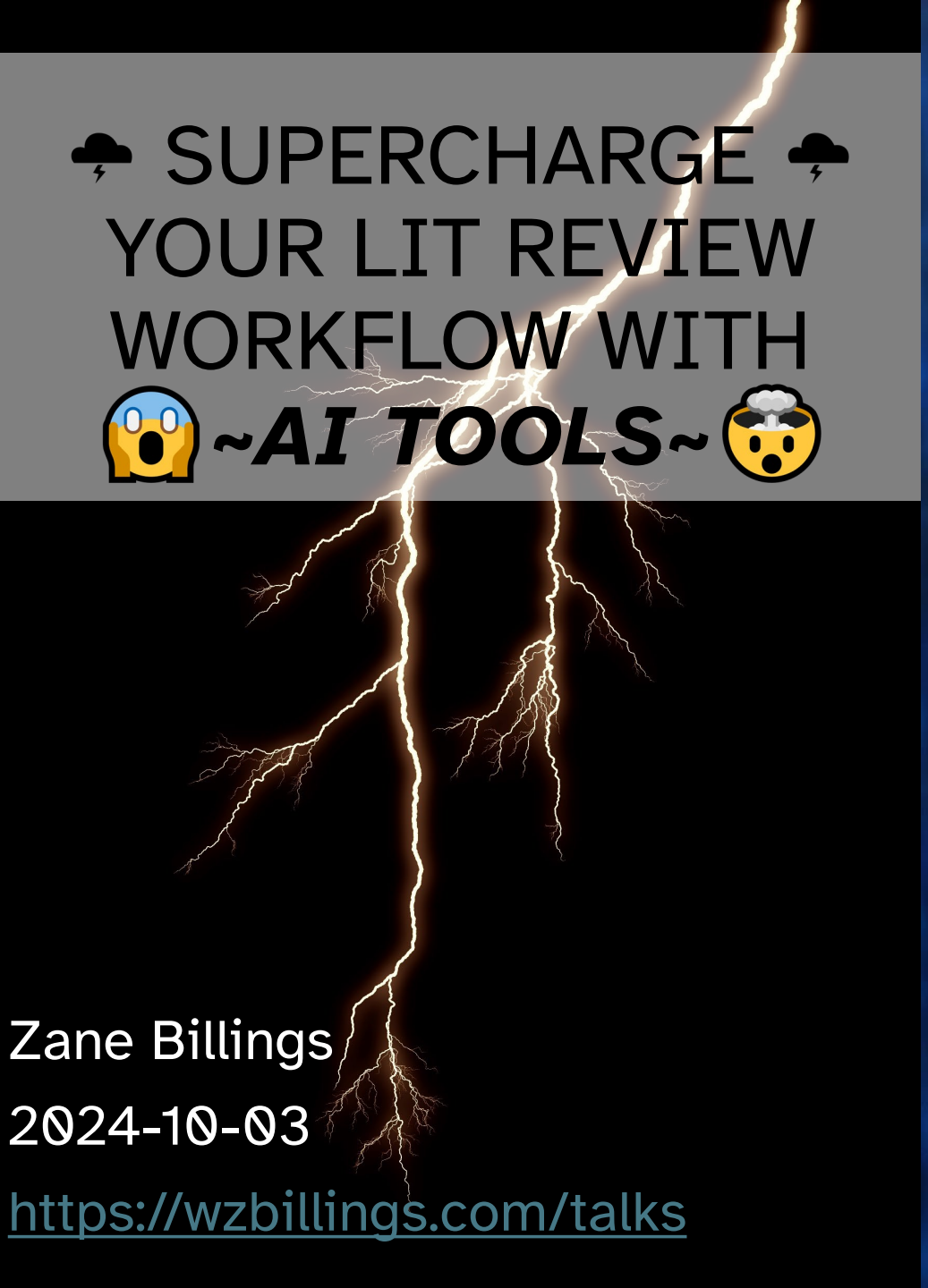
⛈ SUPERCHARGE ⛈ YOUR LIT REVIEW WORKFLOW WITH 😱~*AI TOOLS*~😱



Zane Billings

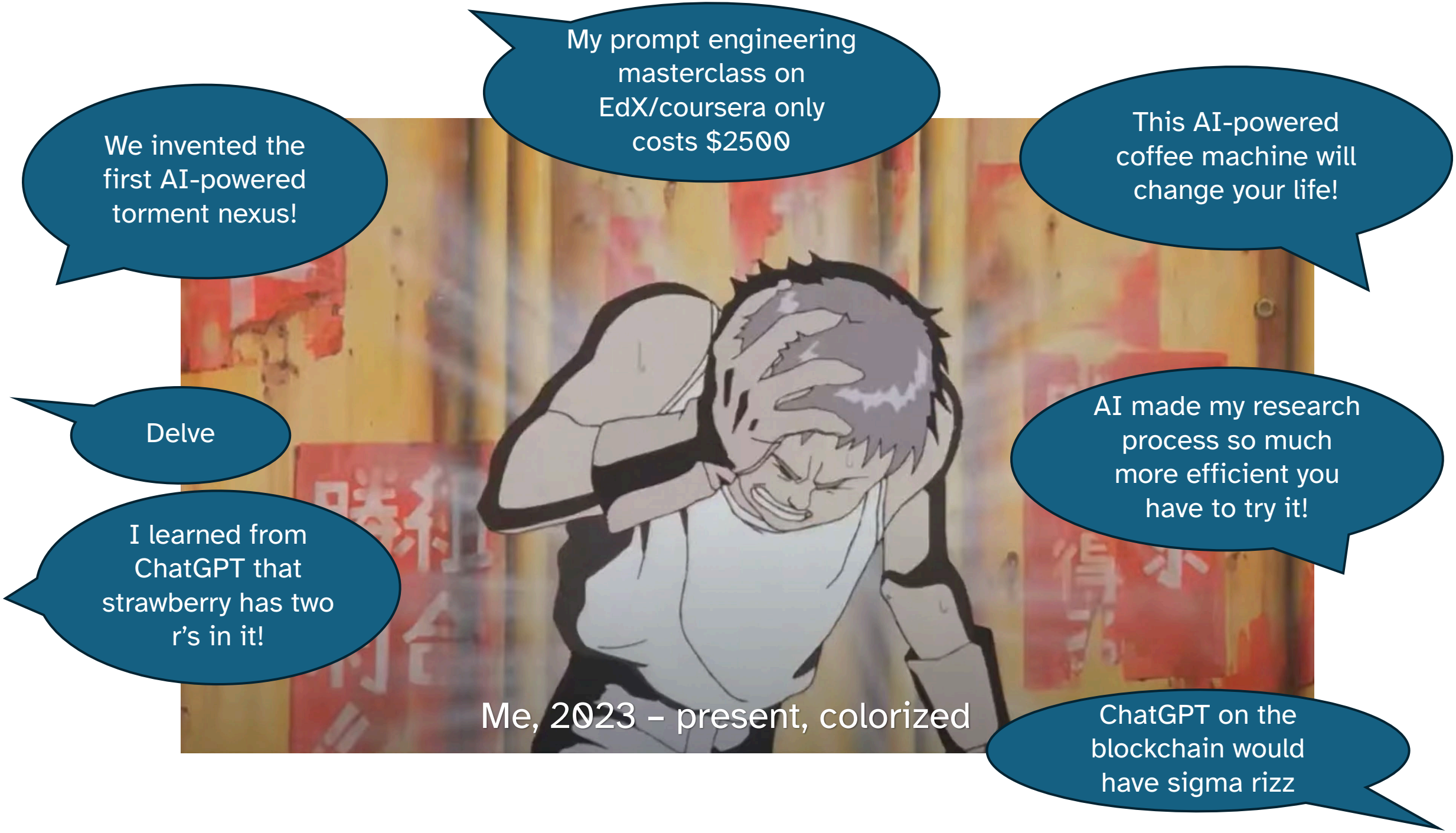
2024-10-03

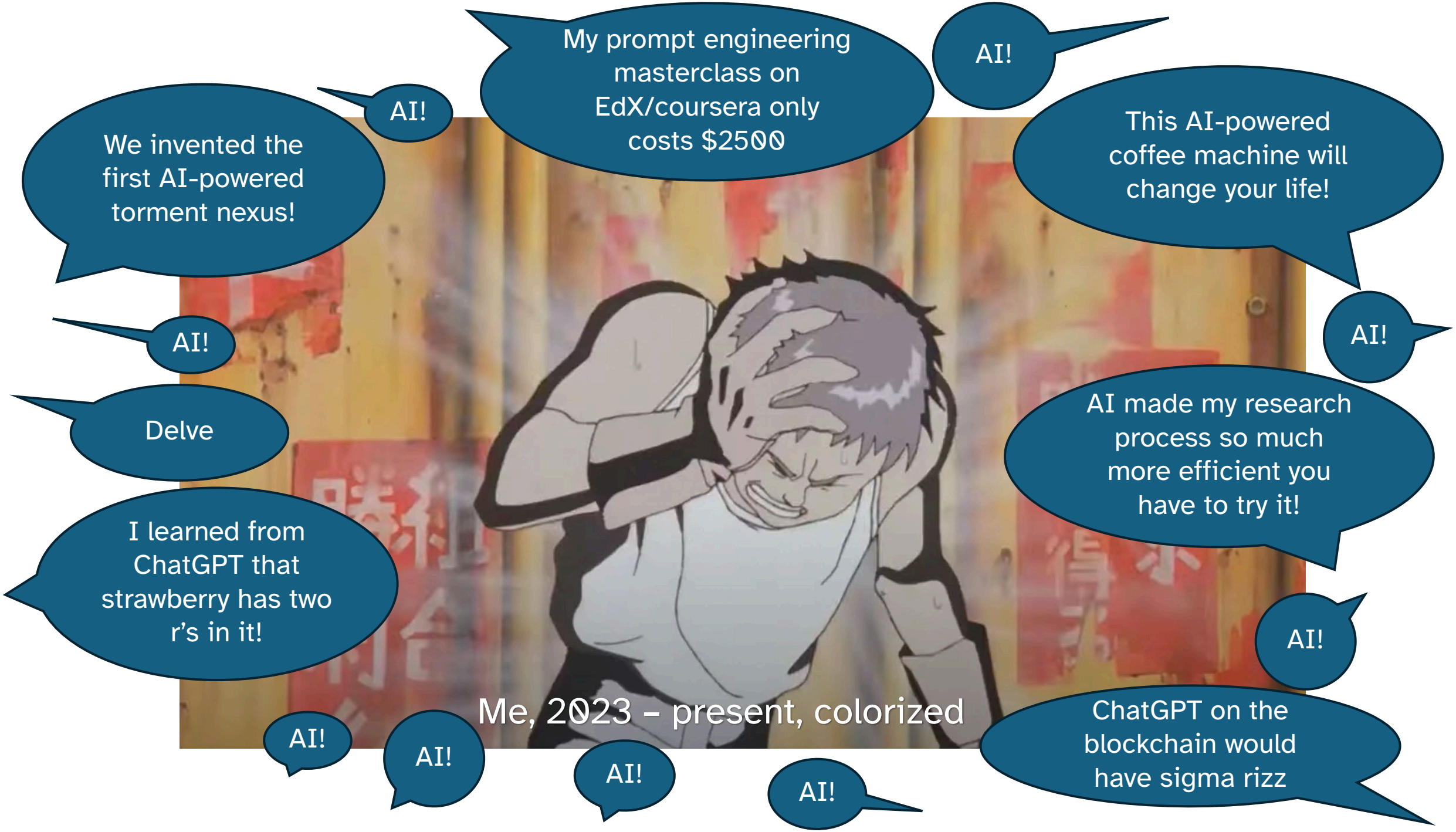
https://wzbillings.com/talks

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


My prompt engineering masterclass on EdX/coursera only costs $2500
We invented the first AI-powered torment nexus!
This AI-powered coffee machine will change your life!
Delve
AI made my research process so much more efficient you have to try it!
I learned from ChatGPT that strawberry has two r's in it!
Me, 2023 – present, colorized
ChatGPT on the blockchain would have sigma rizz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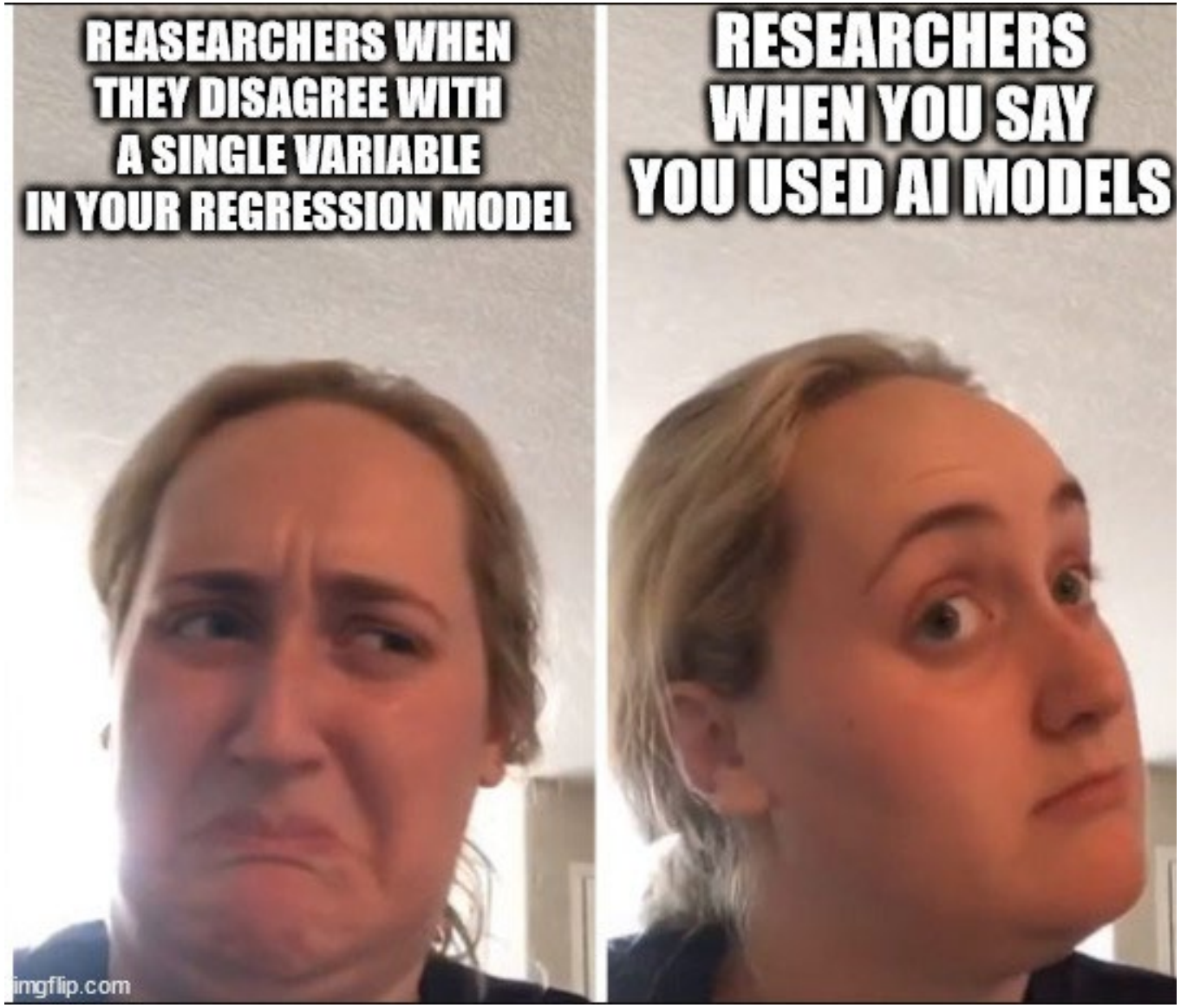
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RESEARCHERS WHEN YOU SAY YOU USED AI MODELS
imgflip.com

My journey as an AI hater

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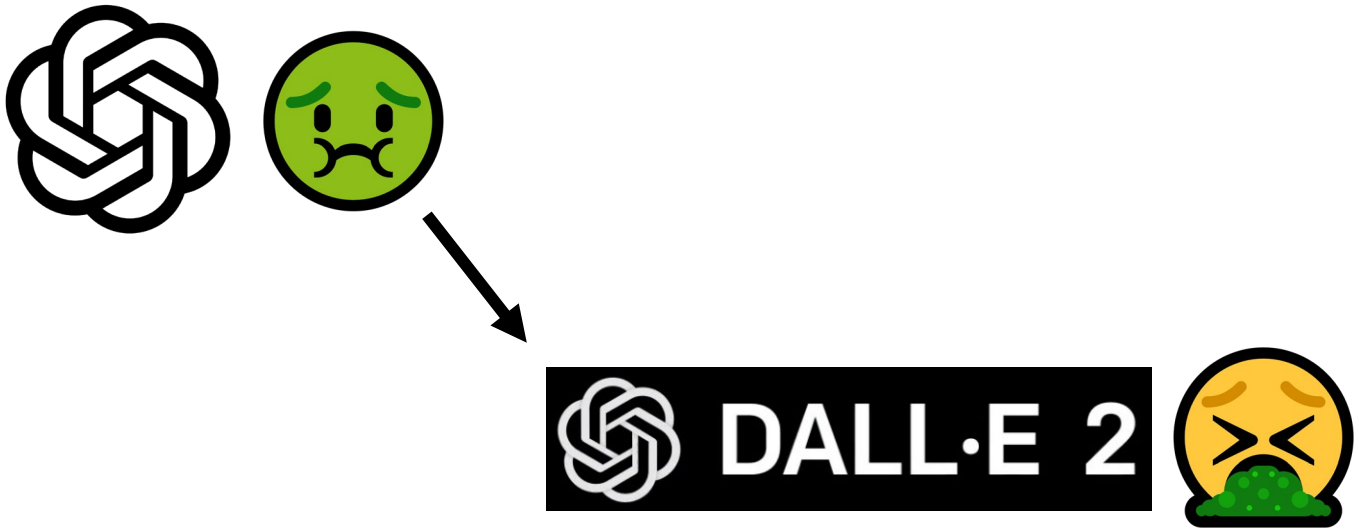
My journey as an AI hater



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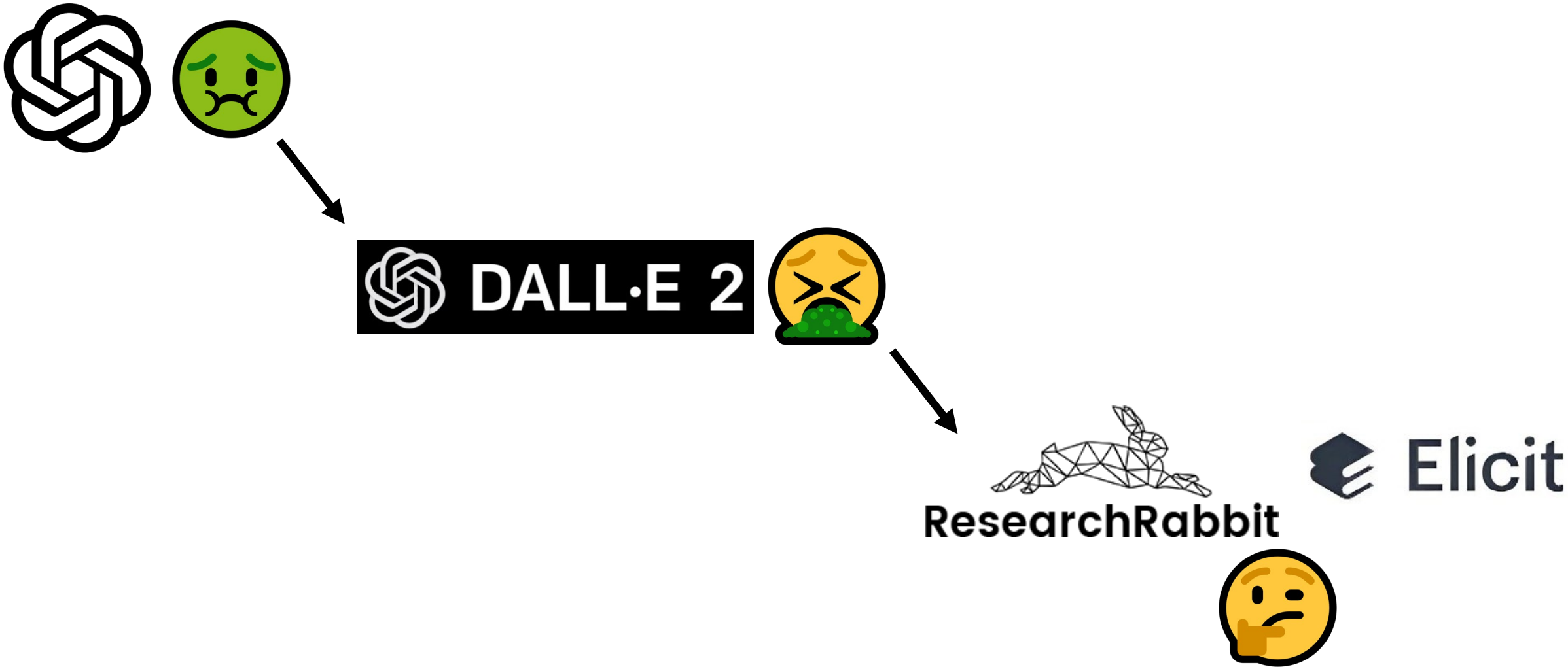
My journey as an AI hater



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AI ethics

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- 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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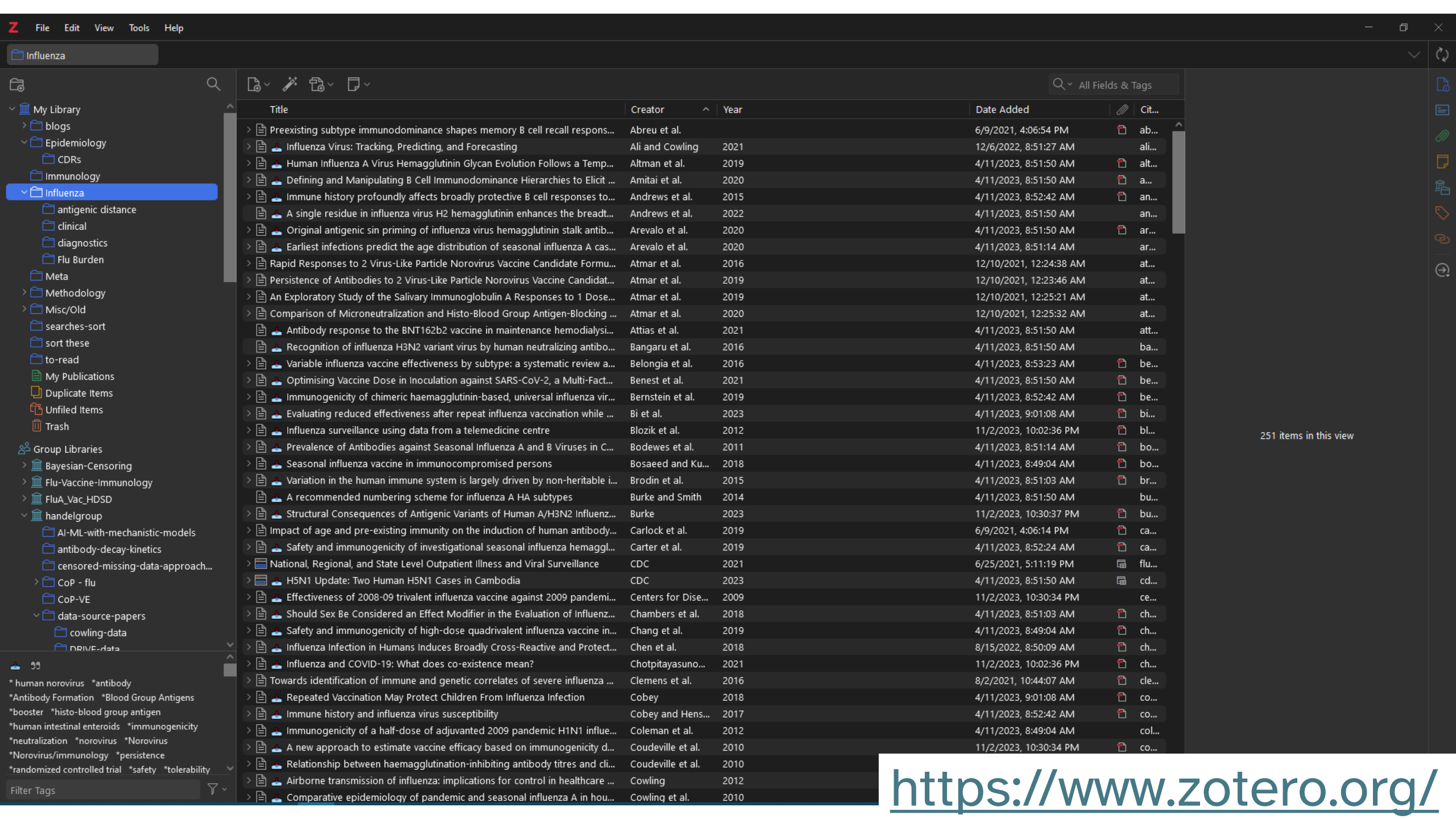
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Bayesian-Censoring
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censored-missing-data-approach...
CoP - flu
CoP-VE
data-source-papers
cowling-data
* human norovirus *antibody
*Antibody Formation *Blood Group Antigens
*booster *histo-blood group antigen
*human intestinal enteroids *immunogenicity
*neutralization *norovirus *Norovirus
*Norovirus/immunology *persistence
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Preexisting subtype immunodominance shapes memory B cell recall respons... Abreu et al. 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 Temp... Altman et al. 2019 4/11/2023, 8:51:50 AM alt...
Defining and Manipulating B Cell Immunodominance Hierarchies to Elicit ... Amitai et al. 2020 4/11/2023, 8:51:50 AM a...
Immune history profoundly affects broadly protective B cell responses to... Andrews et al. 2015 4/11/2023, 8:52:42 AM an...
A single residue in influenza virus H2 hemagglutinin enhances the breadt... Andrews et al. 2022 4/11/2023, 8:51:50 AM an...
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Rapid Responses to 2 Virus-Like Particle Norovirus Vaccine Candidate Formu... Atmar et al. 2016 12/10/2021, 12:24:38 AM at...
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An Exploratory Study of the Salivary Immunoglobulin A Responses to 1 Dose... Atmar et al. 2019 12/10/2021, 12:25:21 AM at...
Comparison of Microneutralization and Histo-Blood Group Antigen-Blocking ... Atmar et al. 2020 12/10/2021, 12:25:32 AM at...
Antibody response to the BNT162b2 vaccine in maintenance hemodialysi... Attias et al. 2021 4/11/2023, 8:51:50 AM att...
Recognition of influenza H3N2 variant virus by human neutralizing antibo... Bangaru et al. 2016 4/11/2023, 8:51:50 AM ba...
Variable influenza vaccine effectiveness by subtype: a systematic review a... Belongia et al. 2016 4/11/2023, 8:53:23 AM be...
Optimising Vaccine Dose in Inoculation against SARS-CoV-2, a Multi-Fact... Benest et al. 2021 4/11/2023, 8:51:50 AM be...
Immunogenicity of chimeric haemagglutinin-based, universal influenza vir... Bernstein et al. 2019 4/11/2023, 8:52:42 AM be...
Evaluating reduced effectiveness after repeat influenza vaccination while ... 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 C... 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 i... 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 Influenz... Burke 2023 11/2/2023, 10:30:37 PM bu...
Impact of age and pre-existing immunity on the induction of human antibody... Carlock et al. 2019 6/9/2021, 4:06:14 PM ca...
Safety and immunogenicity of investigational seasonal influenza hemaggl... 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 pandemi... Centers for Dise... 2009 11/2/2023, 10:30:34 PM ce...
Should Sex Be Considered an Effect Modifier in the Evaluation of Influenz... Chambers et al. 2018 4/11/2023, 8:51:03 AM ch...
Safety and immunogenicity of high-dose quadrivalent influenza vaccine in... Chang et al. 2019 4/11/2023, 8:49:04 AM ch...
Influenza Infection in Humans Induces Broadly Cross-Reactive and Protect... 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 ... 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...
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Relationship between haemagglutination-inhibiting antibody titres and cli... Coudeville et al. 2010
Airborne transmission of influenza: implications for control in healthcare ... Cowling 2012
Comparative epidemiology of pandemic and seasonal influenza A in hou... Cowling et al. 2010
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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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- Contains tools for importing search results, deduplication, and exporting bibliographies.
- Web capture, Word integration, BibTeX support

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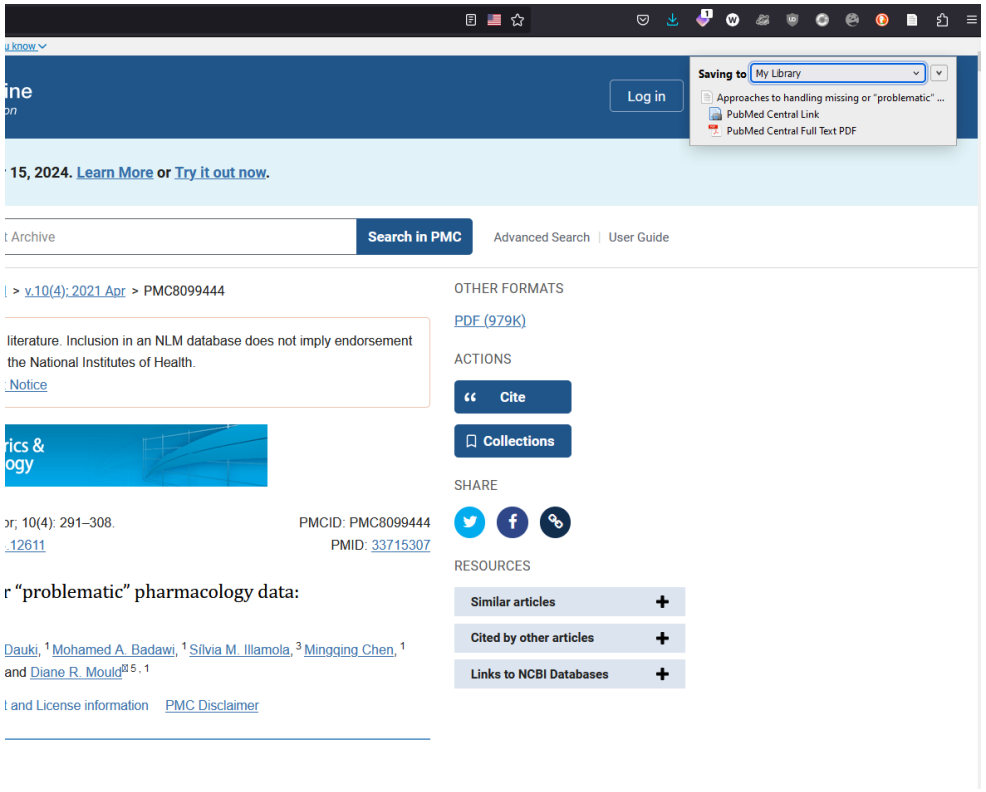

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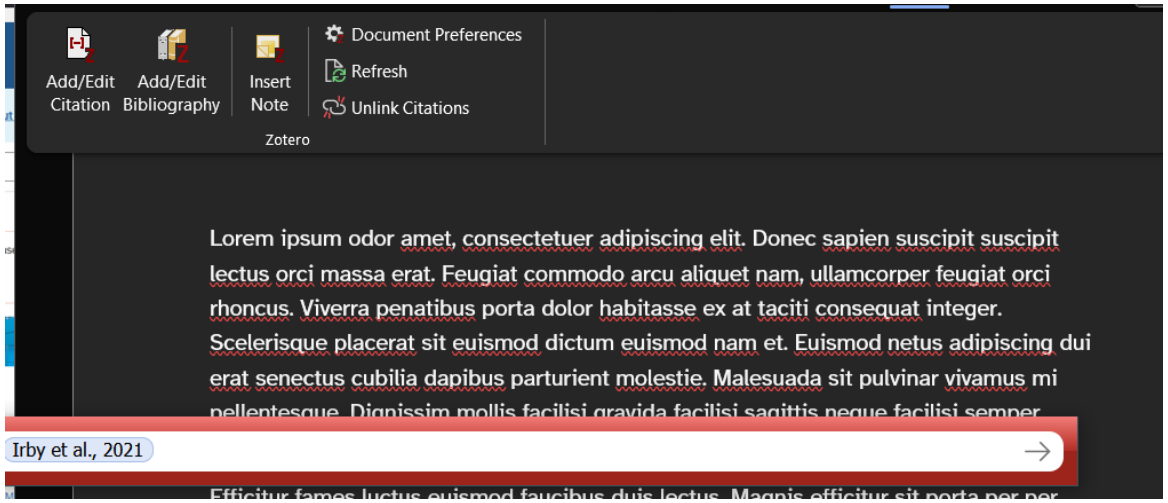

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1. Irby DJ, Ibrahim ME, Dauki AM, et al. Approaches to handling missing or "problematic" pharmacology data: Pharmacokinetics. *CPT Pharmacomet Syst Pharmacol*. 2021;10(4):291-308. doi:10.1002/psp4.12611

https://www.zotero.org/

ResearchRabbit

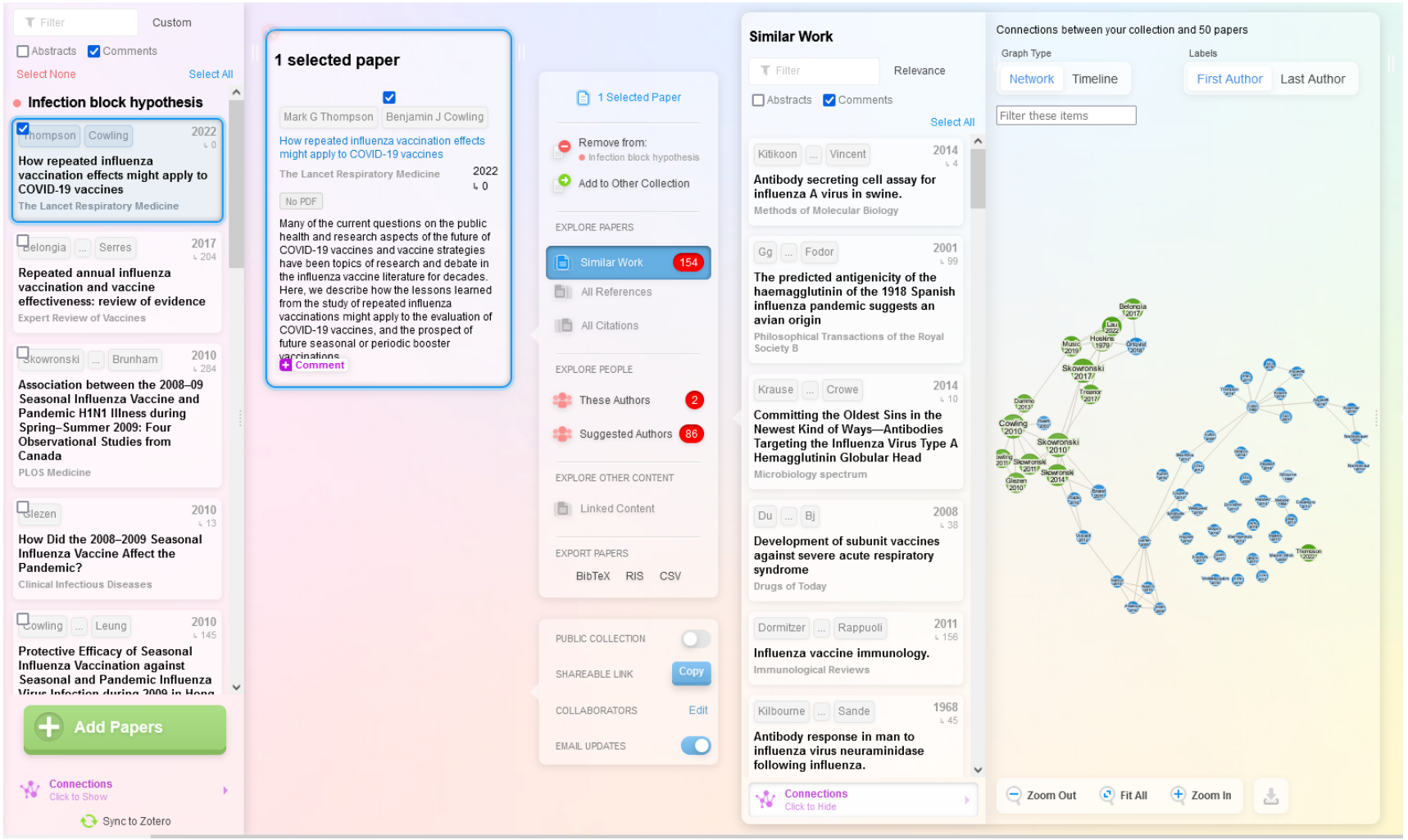
https://www.researchrabbit.ai/

ResearchRabbit

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

https://www.researchrabbit.ai/

ResearchRabbit



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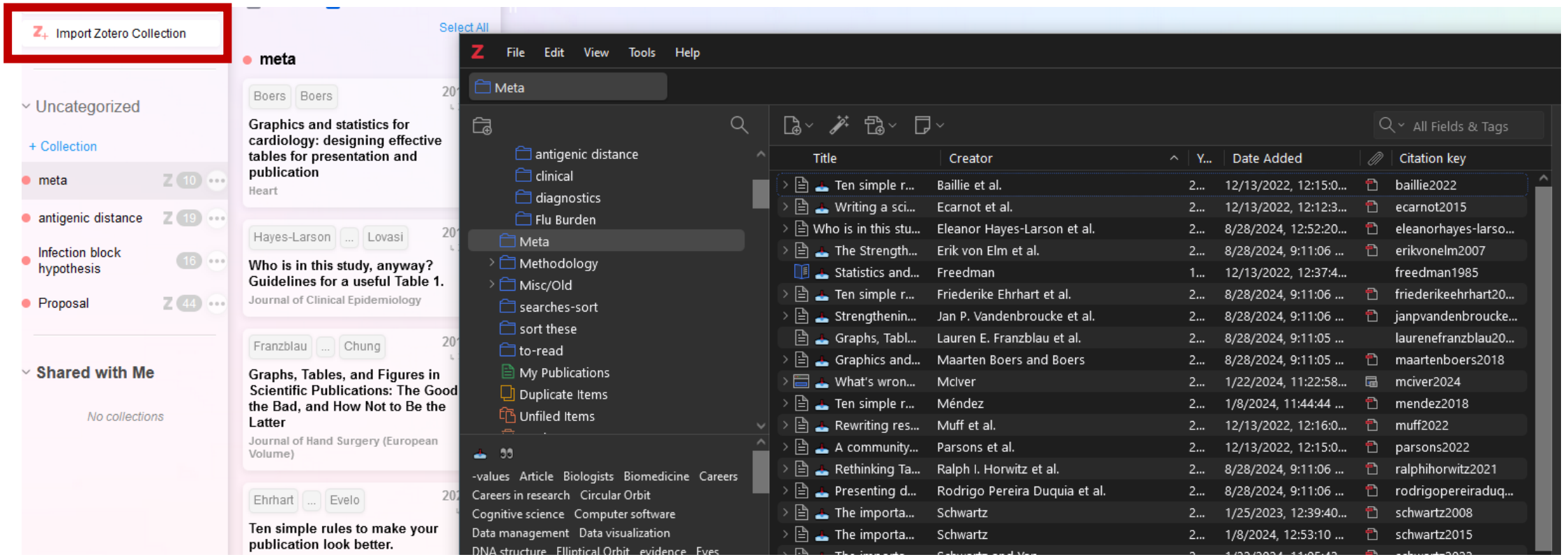

https://www.researchrabbit.ai/

ResearchRabbit

- Free web-based tool for graphically representing literature collections and finding related papers
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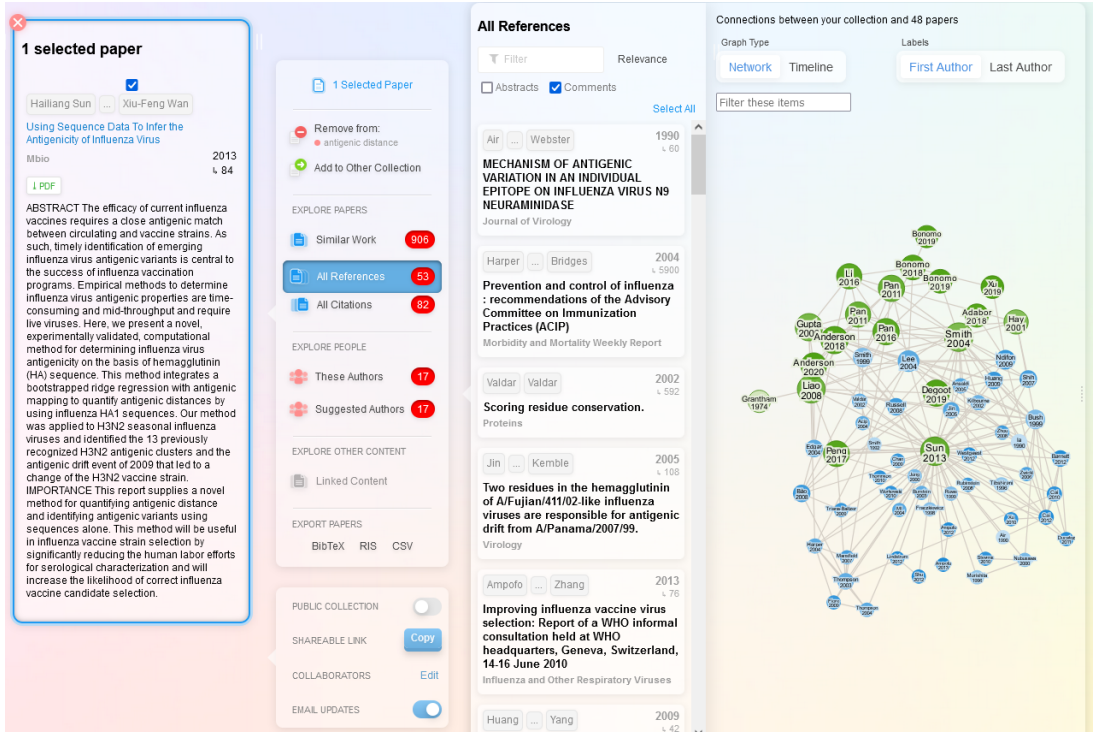
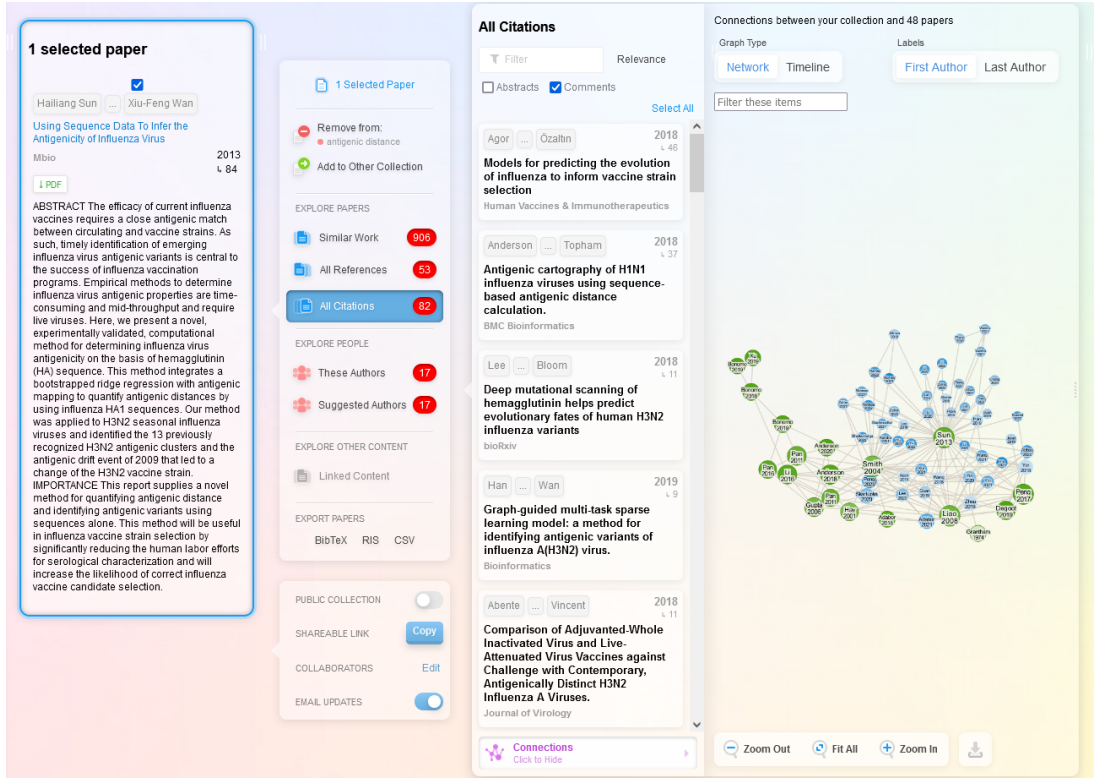
- Visualize references and citations of a given paper or all papers in collection (like Web of Science but easier to use)

https://www.researchrabbit.ai/

ResearchRabbit





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ResearchRabbit

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

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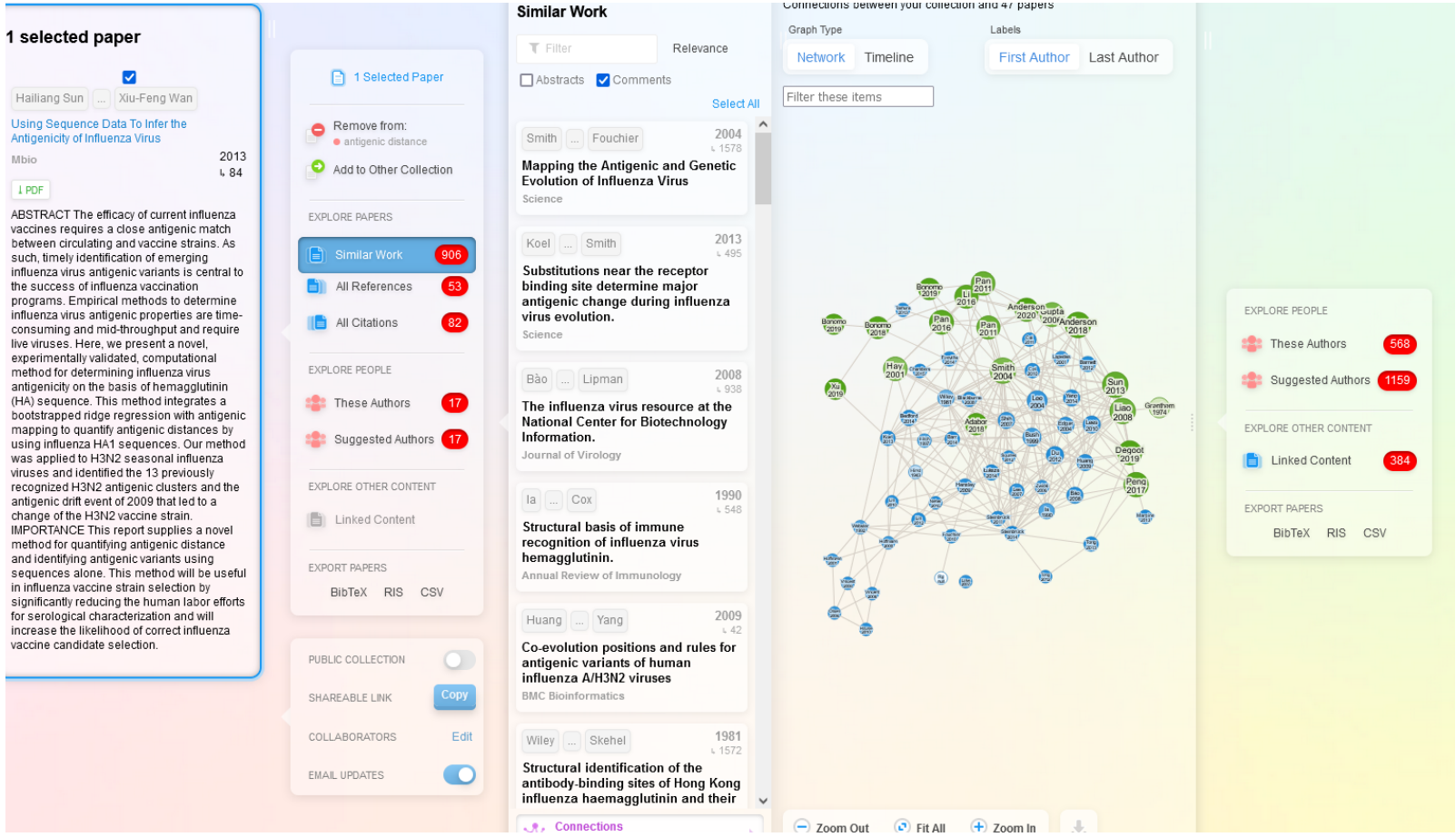
ResearchRabbit



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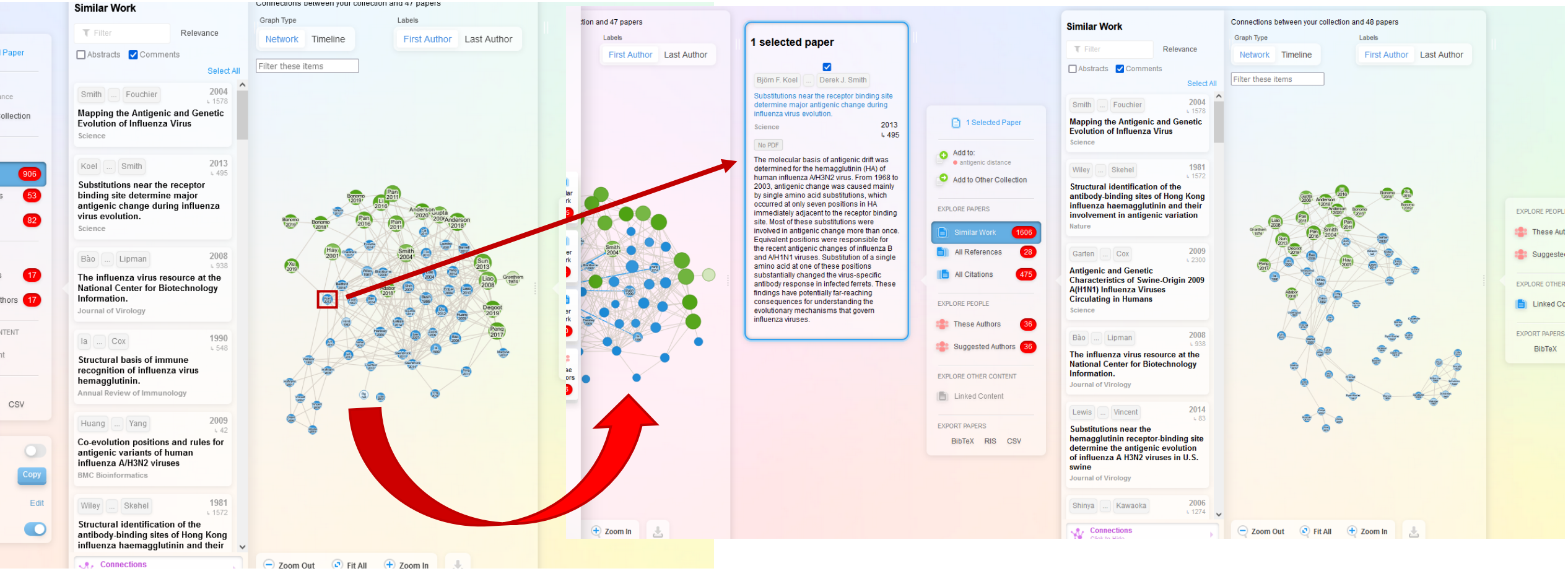

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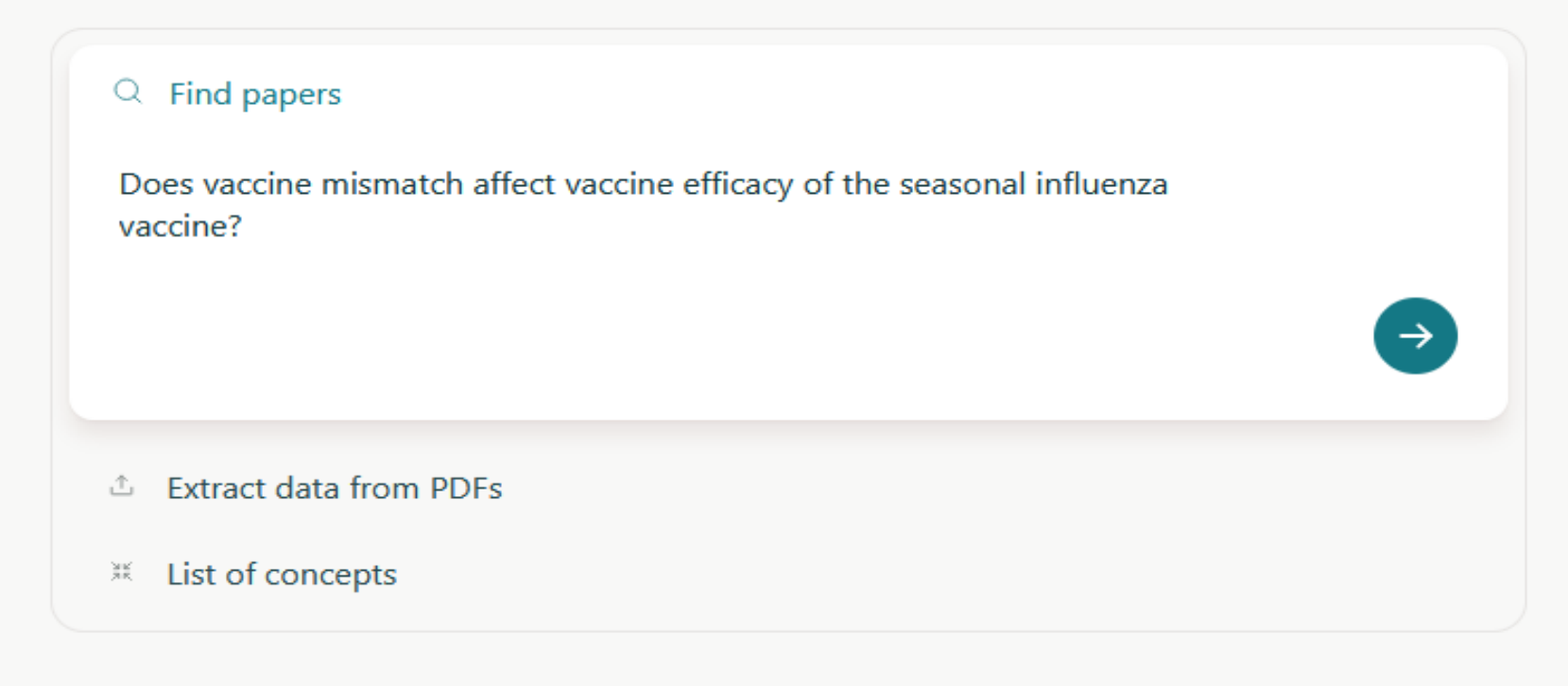
https://www.elicit.com/

Elicit

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

https://www.elicit.com/

Elicit



https://www.elicit.com/

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- Searches full text when available or abstract to generate summaries. Info is drawn only from paper to prevent certain types of hallucinations.

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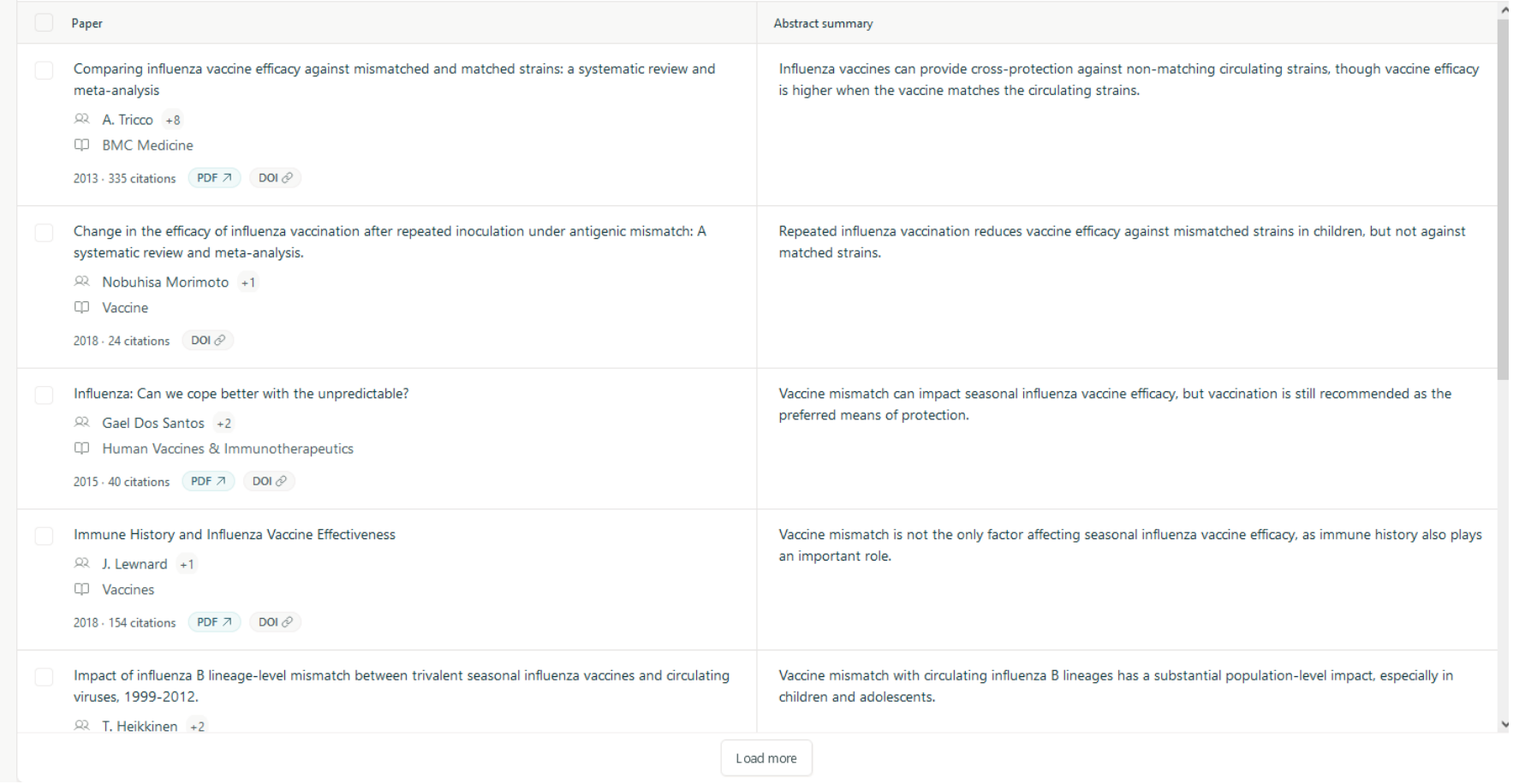
Elicit



Paper	Abstract summary
Comparing influenza vaccine efficacy against mismatched and matched strains: a systematic review and meta-analysis A. Tricco +8 BMC Medicine 2013 · 335 citations PDF DOI	Influenza vaccines can provide cross-protection against non-matching circulating strains, though vaccine efficacy is higher when the vaccine matches the circulating strains.
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 DOI	Repeated influenza vaccination reduces vaccine efficacy against mismatched strains in children, but not against matched strains.
Influenza: Can we cope better with the unpredictable? Gael Dos Santos +2 Human Vaccines & Immunotherapeutics 2015 · 40 citations PDF DOI	Vaccine mismatch can impact seasonal influenza vaccine efficacy, but vaccination is still recommended as the preferred means of protection.
Immune History and Influenza Vaccine Effectiveness J. Lewnard +1 Vaccines 2018 · 154 citations PDF DOI	Vaccine mismatch is not the only factor affecting seasonal influenza vaccine efficacy, as immune history also plays an important role.
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.

Load more

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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.
- Attempts to find a consensus between the most relevant articles.

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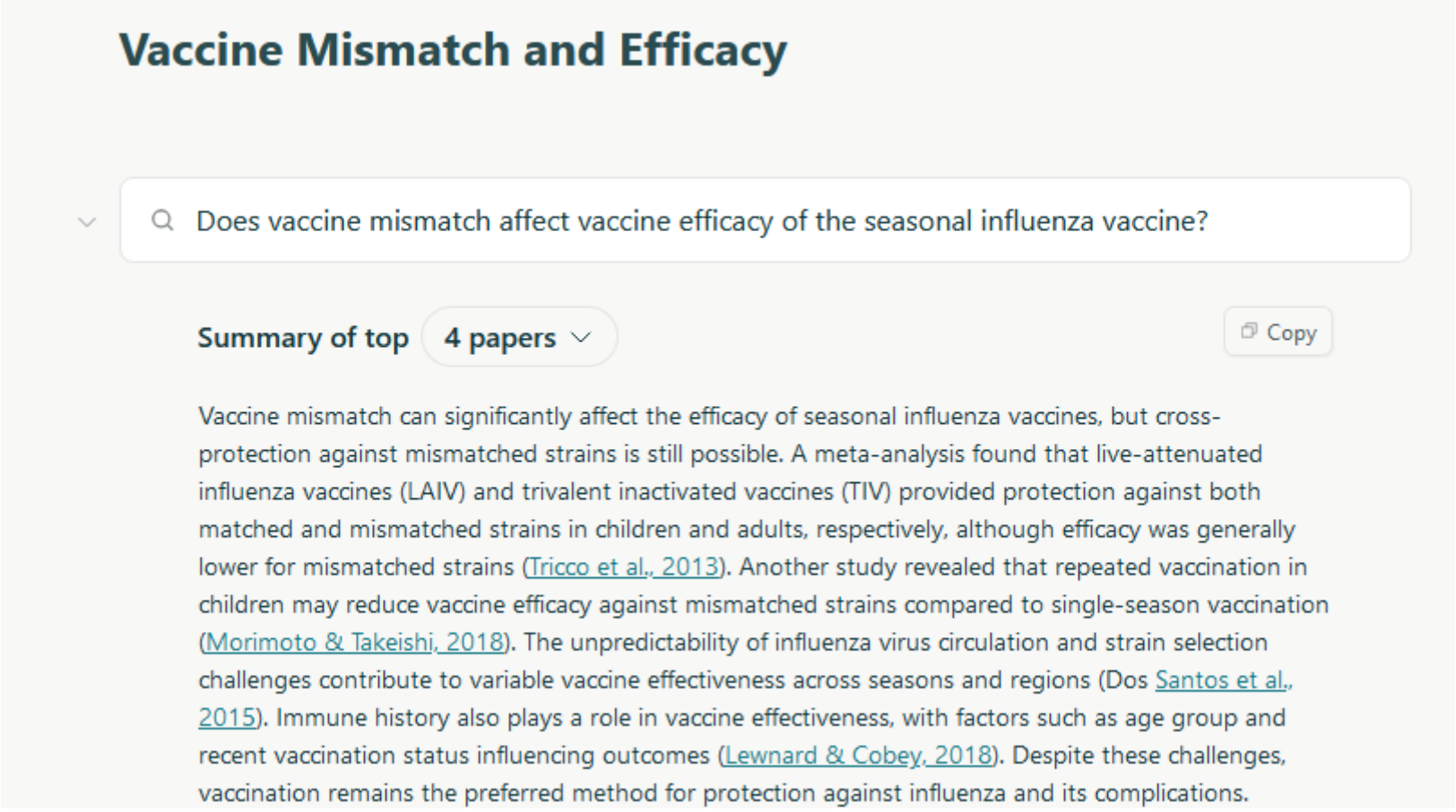
Elicit



https://www.elicit.com/

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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- More for systematic reviews than casual.
- Allows for iterative refinement of search strategies with quantitative metrics.

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

Litsearchr

Methods in Ecology and Evolution
BRITISH ECOLOGICAL SOCIETY

RESEARCH ARTICLE | Free Access

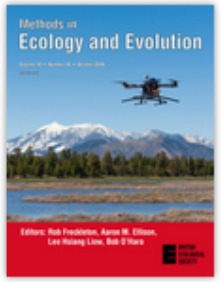
An automated approach to identifying search terms for systematic reviews using keyword co-occurrence networks

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://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.

revtools logo revtools

Article screening for evidence synthesis using manual or visual methods.

topictagger

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

metaDigitise

High-throughput, reproducible extraction of data from figures.

robvis

Create publication quality risk-of-bias assessment figures.

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.

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

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)

GOATed w/ the sauce	ResearchRabbit, ConnectedPapers, etc.
EGOT coded	Elicit, Semantic Scholar
A glass of warm milk	Litsearchr (good for specific tasks)
Full buffet	ChatGPT, Gemini, Bard, Claude, etc.
FLOP BEHAVIOR!!!!	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