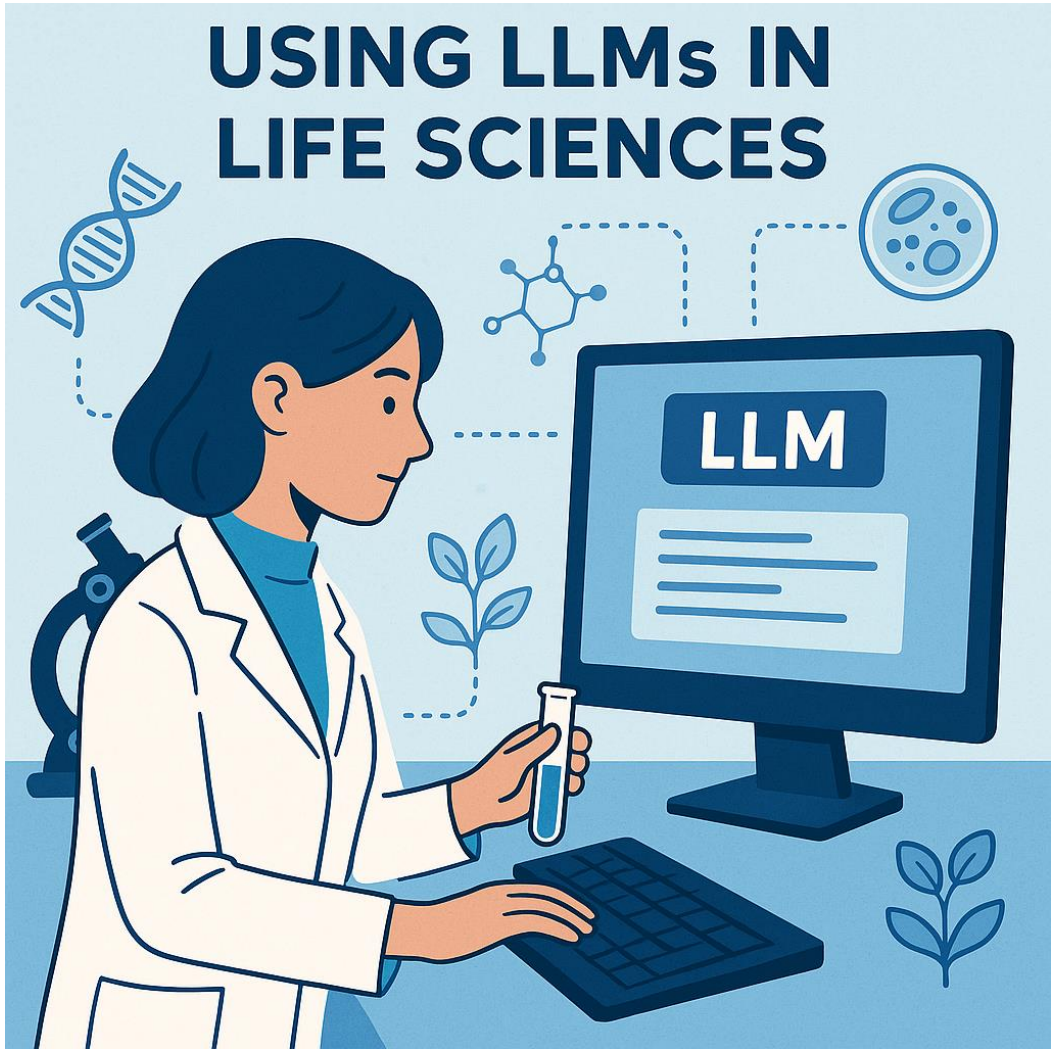
WARWICK

School of Life Sciences



(Image created with ChatGPT)

Andre Pires da Silva

andre.pires@warwick.ac.uk

1 Oct 2026

Goals of this talk

1- Introduction



2- Tools and applications



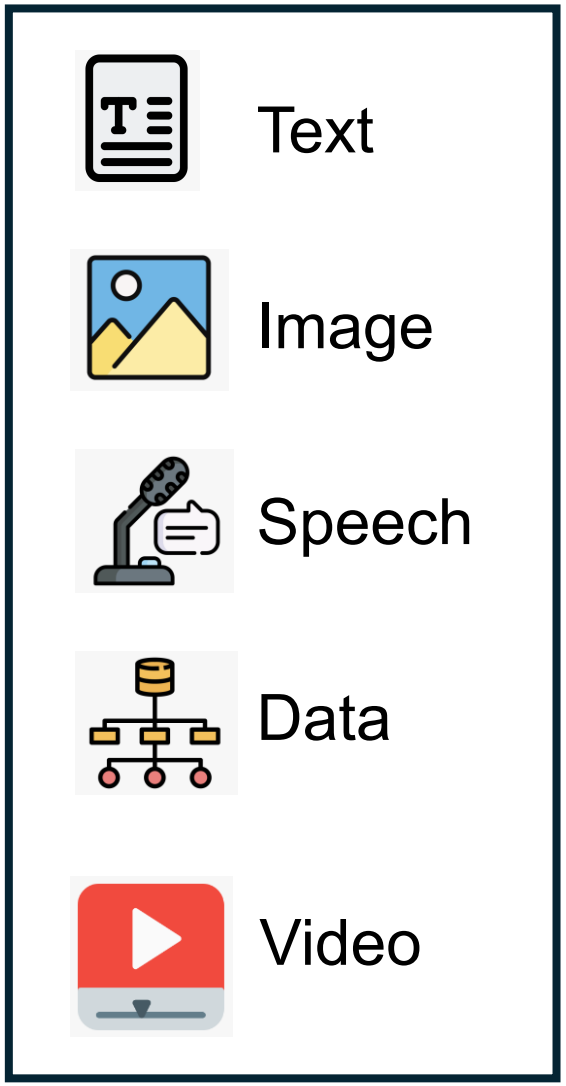
3- Compliance



4- Limitations



Foundation model



Training

>500 Gb
(175b)

GPU

Foundation model

Fine-tuning

Tasks

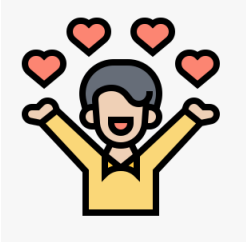
Language

Coding

Image

Self-supervised

Link



Hype about LLMs

Text generation

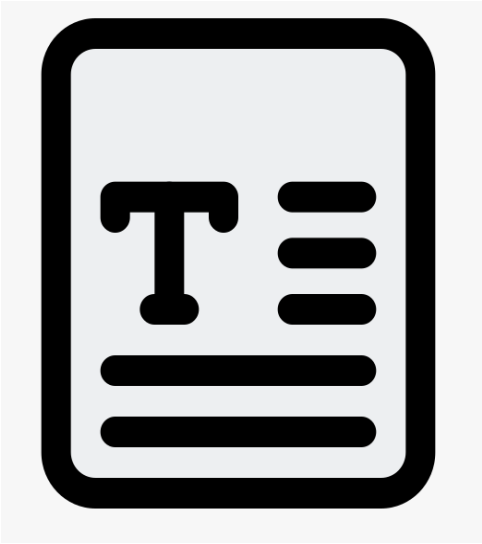


Image generation



Code generation



AI Agents

Cell
Leading Edge

CellPress
OPEN ACCESS

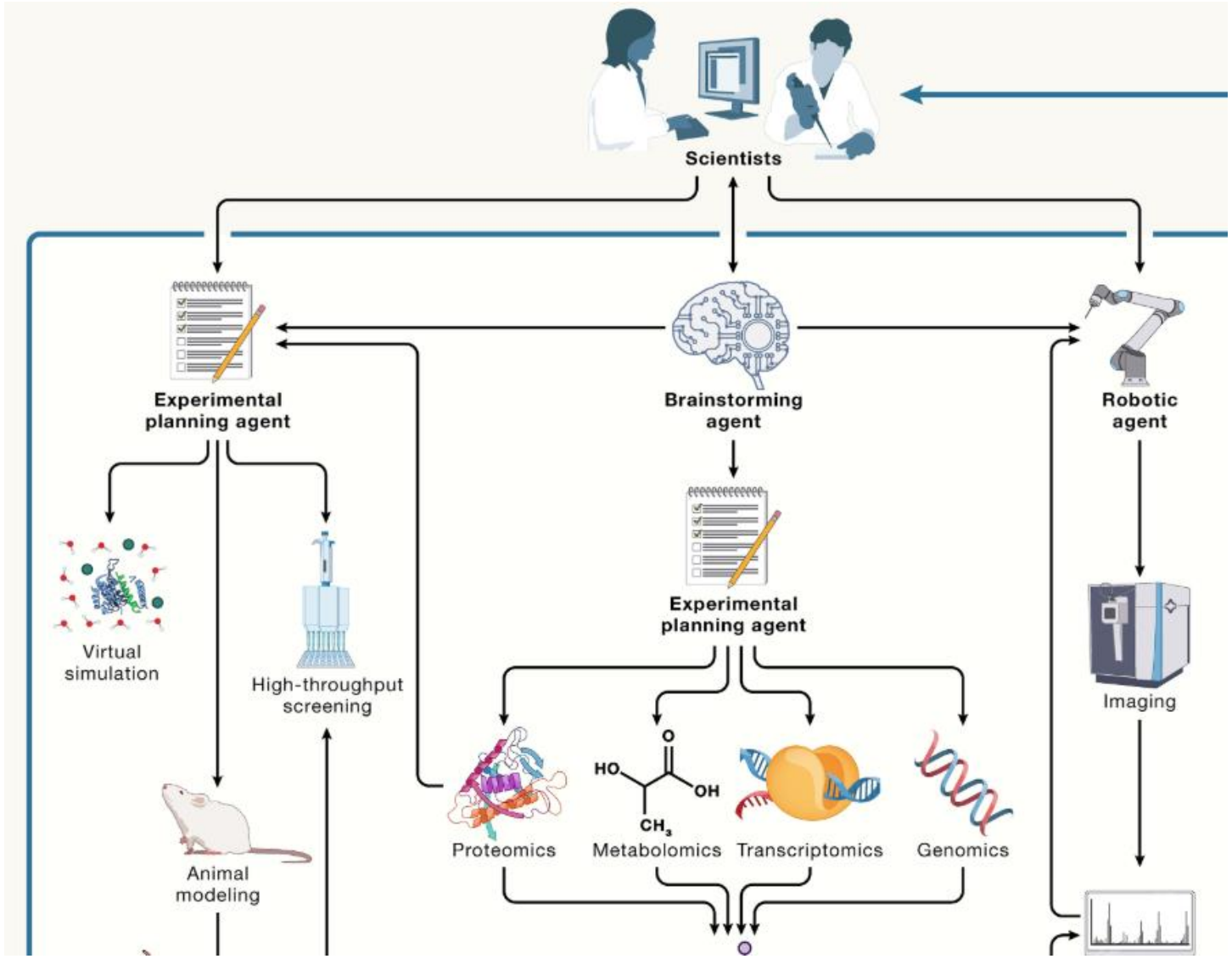
Perspective

Empowering biomedical discovery with AI agents

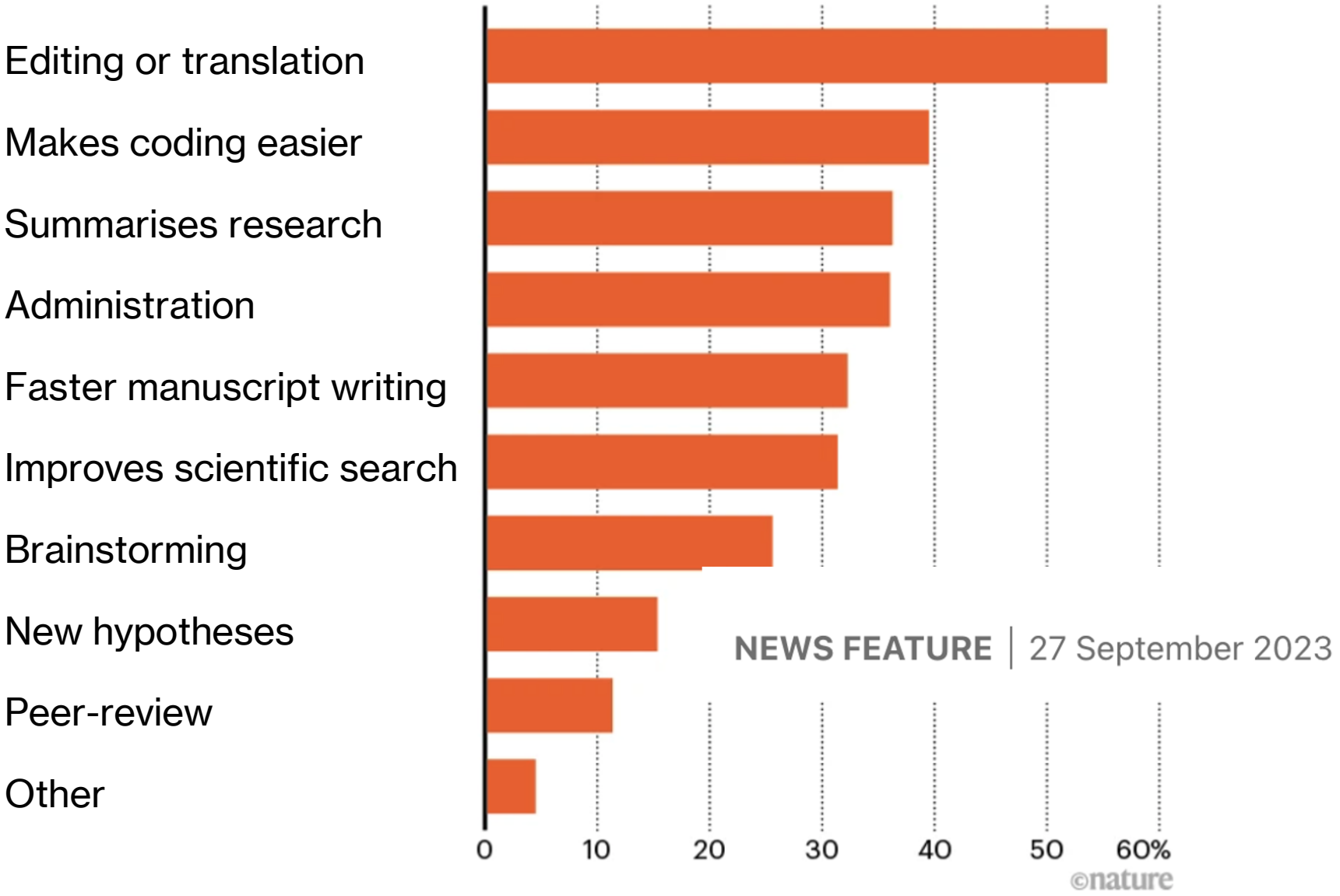
Shanghua Gao,[1] Ada Fang,[1,2,8,11] Yepeng Huang,[1,3,11] Valentina Giunchiglia,[1,4,11] Ayush Noori,[1,5,11] Jonathan Richard Schwarz,[1] Yasha Ektefaie,[1,6] Jovana Kondic,[7] and Marinka Zitnik[1,8,9,10,*]

Link to article

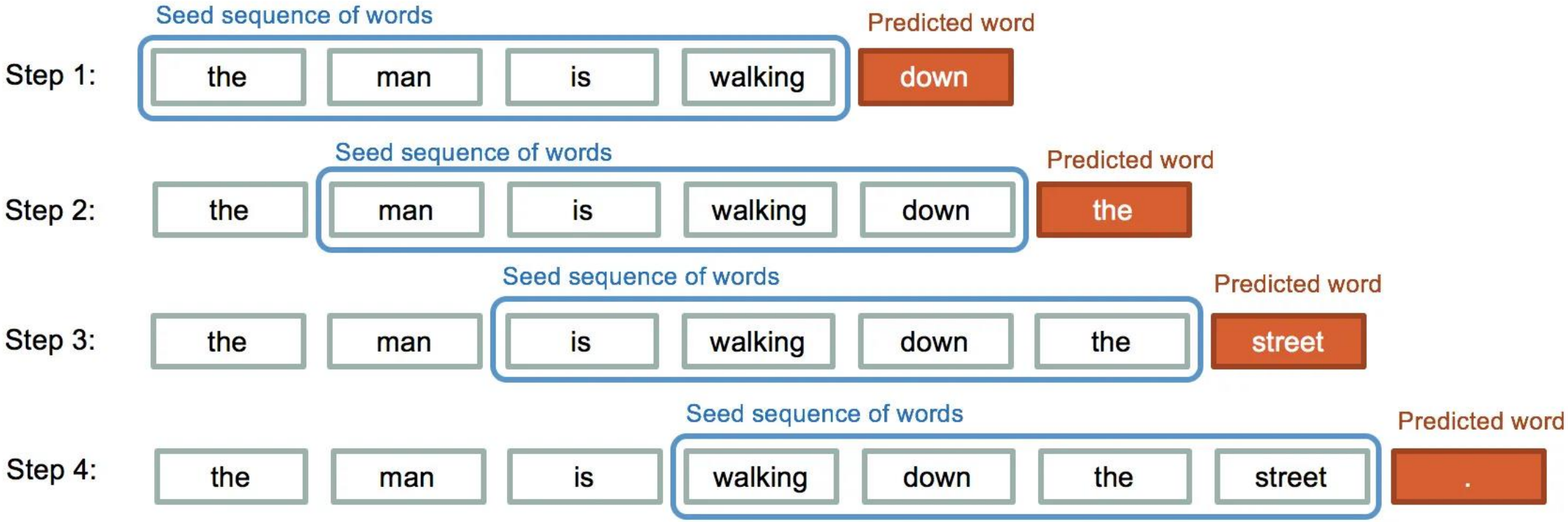
AI Agents


Scientists
Experimental planning agent
Brainstorming agent
Robotic agent
Virtual simulation
High-throughput screening
Experimental planning agent
Imaging
Animal modeling
Proteomics
Metabolomics
Transcriptomics
Genomics

Benefits of AI



LLMs predict the next word



2025

Copilot

Claude

BY ANTHROP\C



Google Gemini

Grok

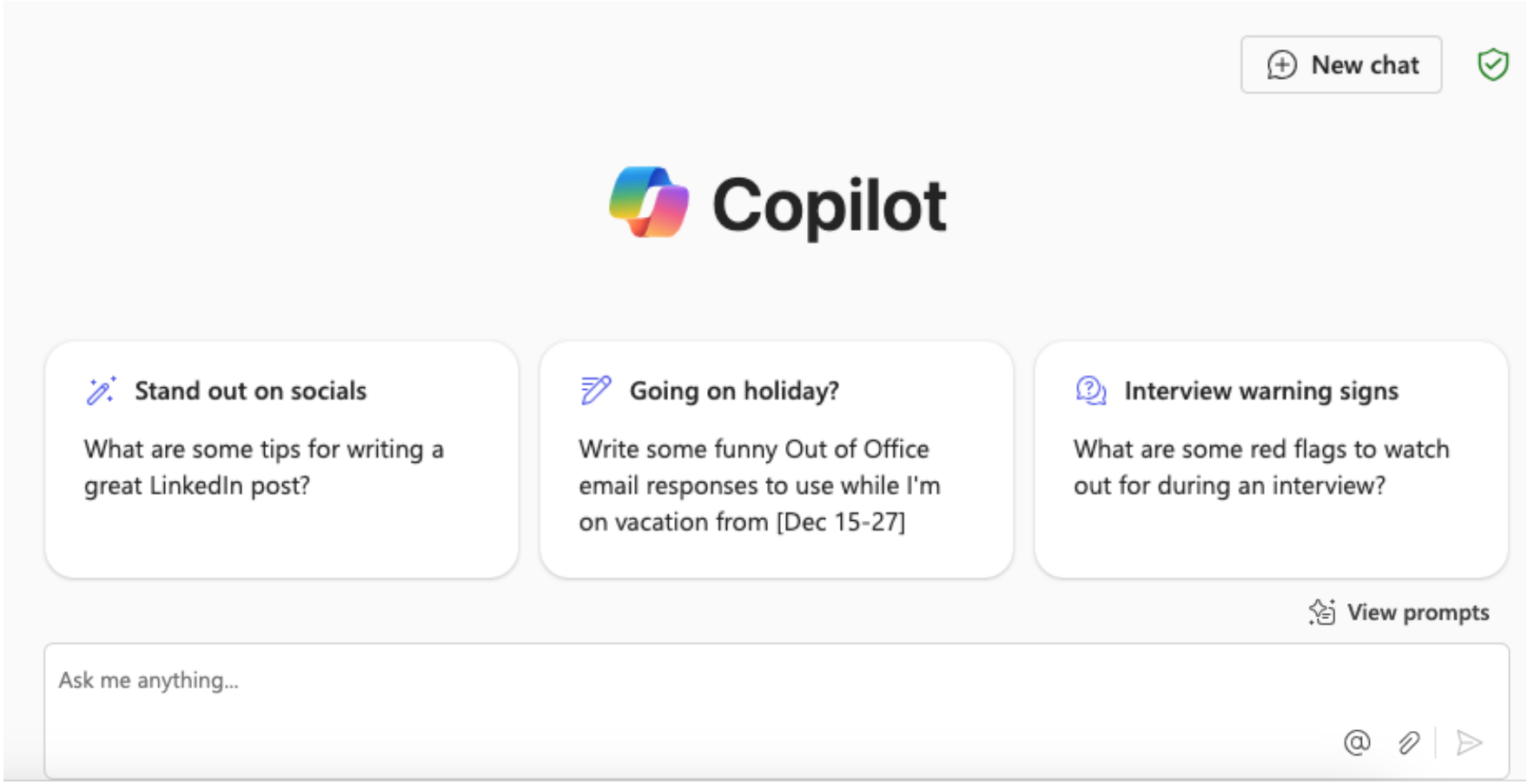
deepseek

MISTRAL AI_

Univ. Warwick recommends Copilot

Edge browser

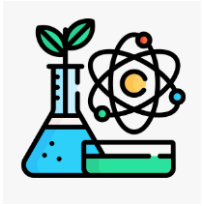
Link to Copilot



Log in with your University of Warwick IT credentials

Some AI models perform better in specific tasks

Science

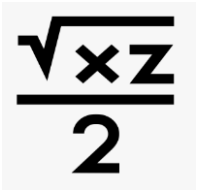


OpenAI Deep research

perplexity

science OS

Mathematics



ChatGPT

Coding



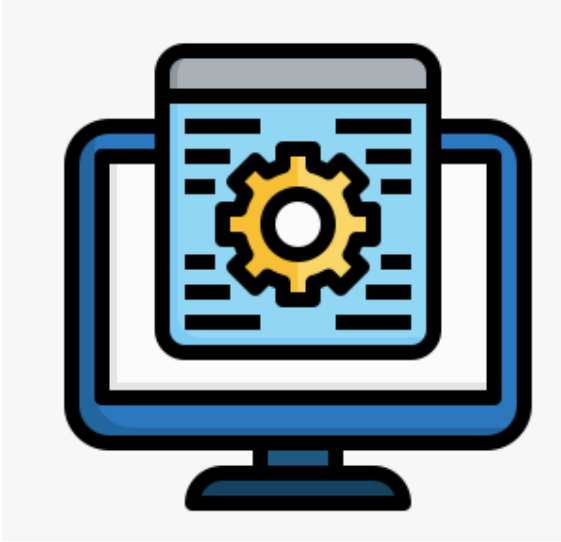
Gemini
Google Gemini Pro

Claude

Copilot

Link

Tools and applications



Looking for references











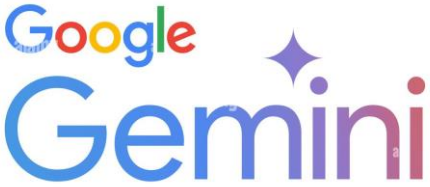


General-purpose LLM



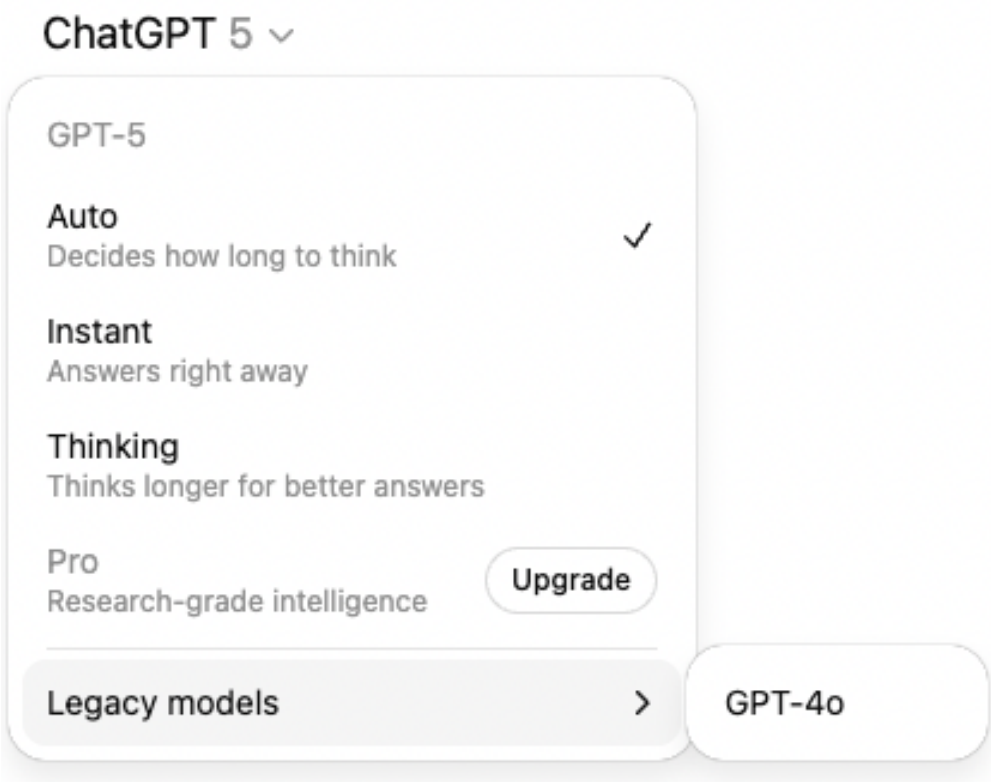


Excel at text generation, but poor sourcing (wrong citations).



alamy
Image ID: 2W6648J
www.alamy.com

U$20,-/month



what came first: the chicken or the egg?

The classic "chicken or the egg" question can be answered in different ways depending on whether we take a **biological/evolutionary** or a **philosophical** perspective:

1. Evolutionary Biology Answer (Egg First)

- Long before chickens existed, many animals—including fish, reptiles, and dinosaurs—were already laying eggs.
- Modern chickens (*Gallus gallus domesticus*) evolved from a wild ancestor, the red junglefowl (*Gallus gallus*), through gradual genetic changes.
- At some point, a bird that was not quite a chicken laid an egg containing a mutation (likely involving changes in reproductive genes or regulatory elements) that gave rise to the first true chicken.
- Therefore, from an evolutionary perspective, the **egg came first**—specifically, an egg laid by a proto-chicken containing the DNA that defined the first chicken.

Supporting literature:

- Dawkins, R. (2009). *The Greatest Show on Earth*. Bantam Press. (Explains gradual evolution of species, including chickens).
- Nesbitt, S.J. & Clarke, J.A. (2016). "The anatomy and taxonomy of the early dinosaur *Coelophysis bauri*." *Palaeontology*. (Shows egg-laying precedes birds). ← **Does not exist**



ChatGPT 5 Thinking

Thought

Short answer: **the egg came first.**

Evolutionarily, egg-laying long predates chickens (fish, reptiles, dinosaurs laid eggs hundreds of millions of years earlier). The first true chicken hatched from an egg laid by a **proto-chicken** whose germline mutation(s) produced a chicken offspring. If you define a "chicken egg" as an egg **laid by a chicken**, you can flip the answer—but biologically, it's egg first.

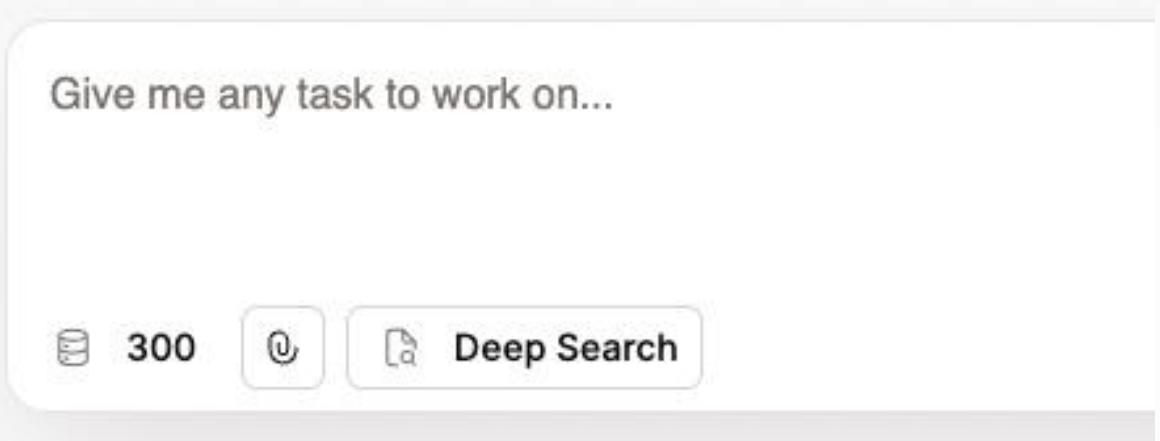
Refs (overview-level):

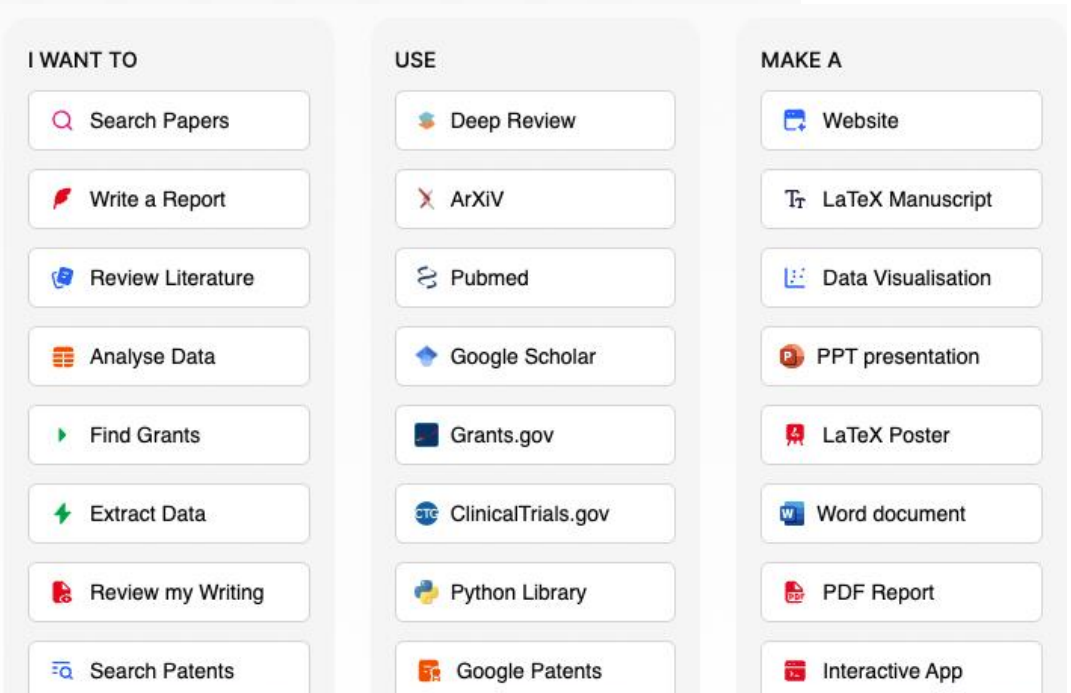
- Benton MJ. *Vertebrate Palaeontology*, 4th ed. Wiley-Blackwell, 2015 (egg-laying deep history).
- Jarvis ED et al. "Whole-genome analyses resolve early branches in the tree of life of modern birds." *Science* (2014) (avian evolution context).

SCISPACE

AI Assistant to Automate Everyday Research Tasks

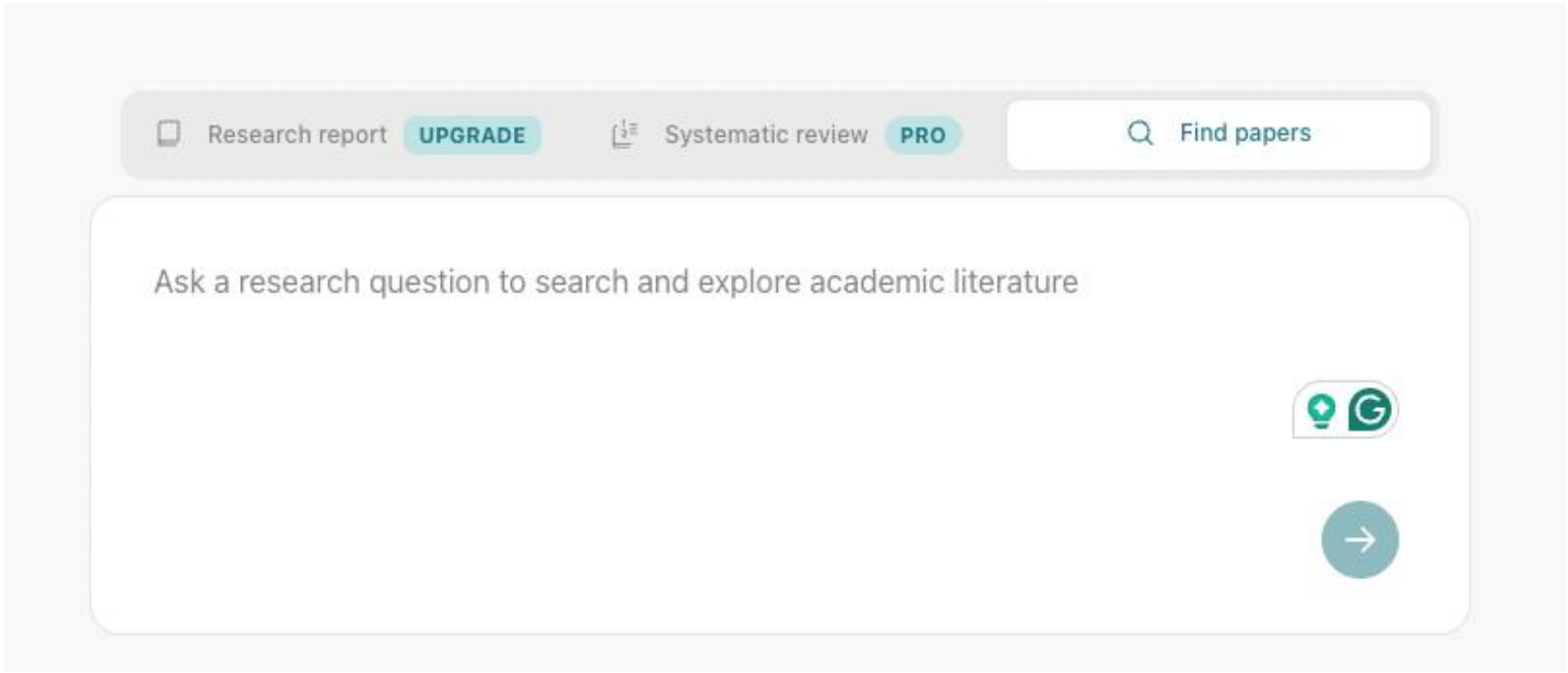
Write a research task or choose one below and SciSpace Agent will use the best AI Models, Tools and Data to complete it for you.



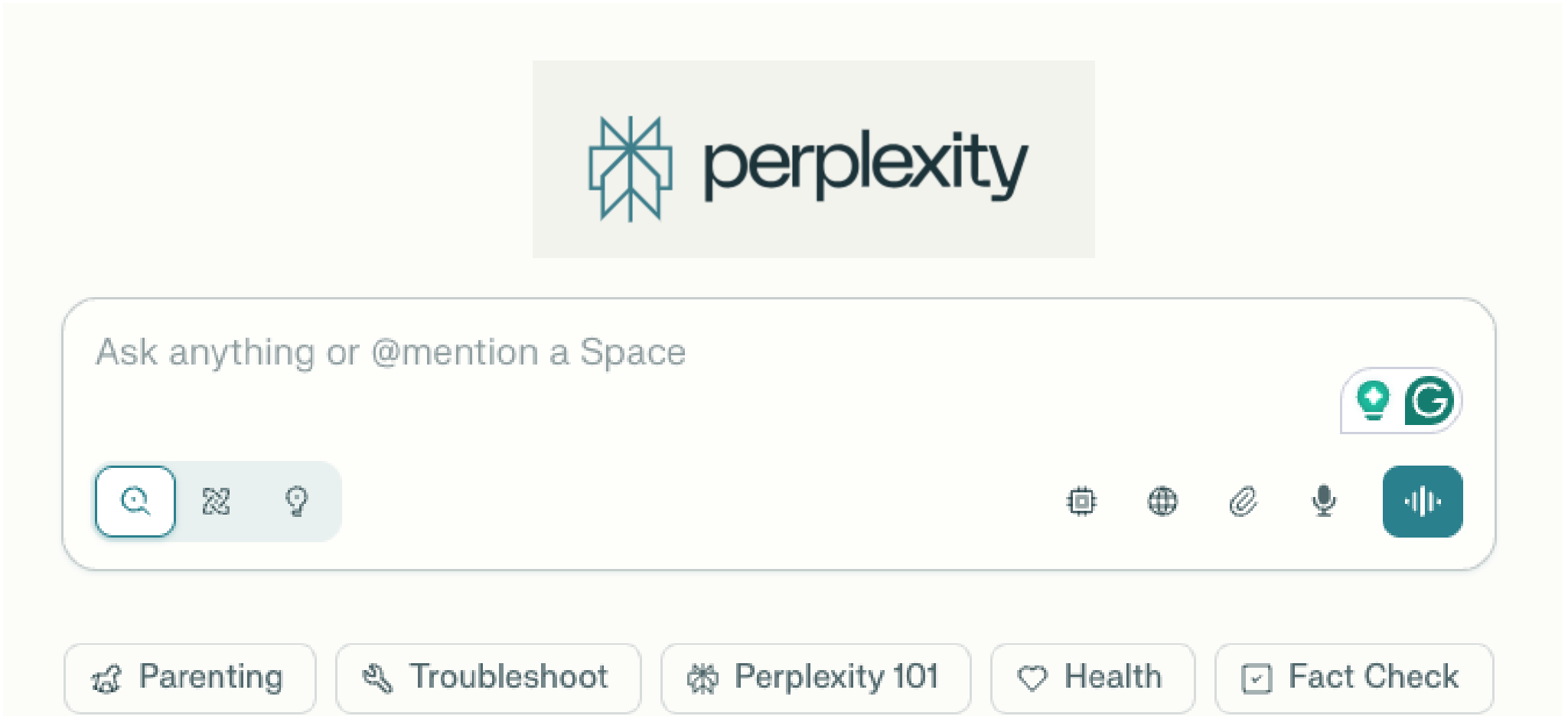


Specialized AI tool focused on deep reading comprehension and interaction with individual academic documents

Elicit



LLM + Academic Database, excels at literature review and extracting scientific information with citations.



LLM + Search Engine, excels at attributed, up-to-date answers.

consensus

Ask the research...

Pro

Filter

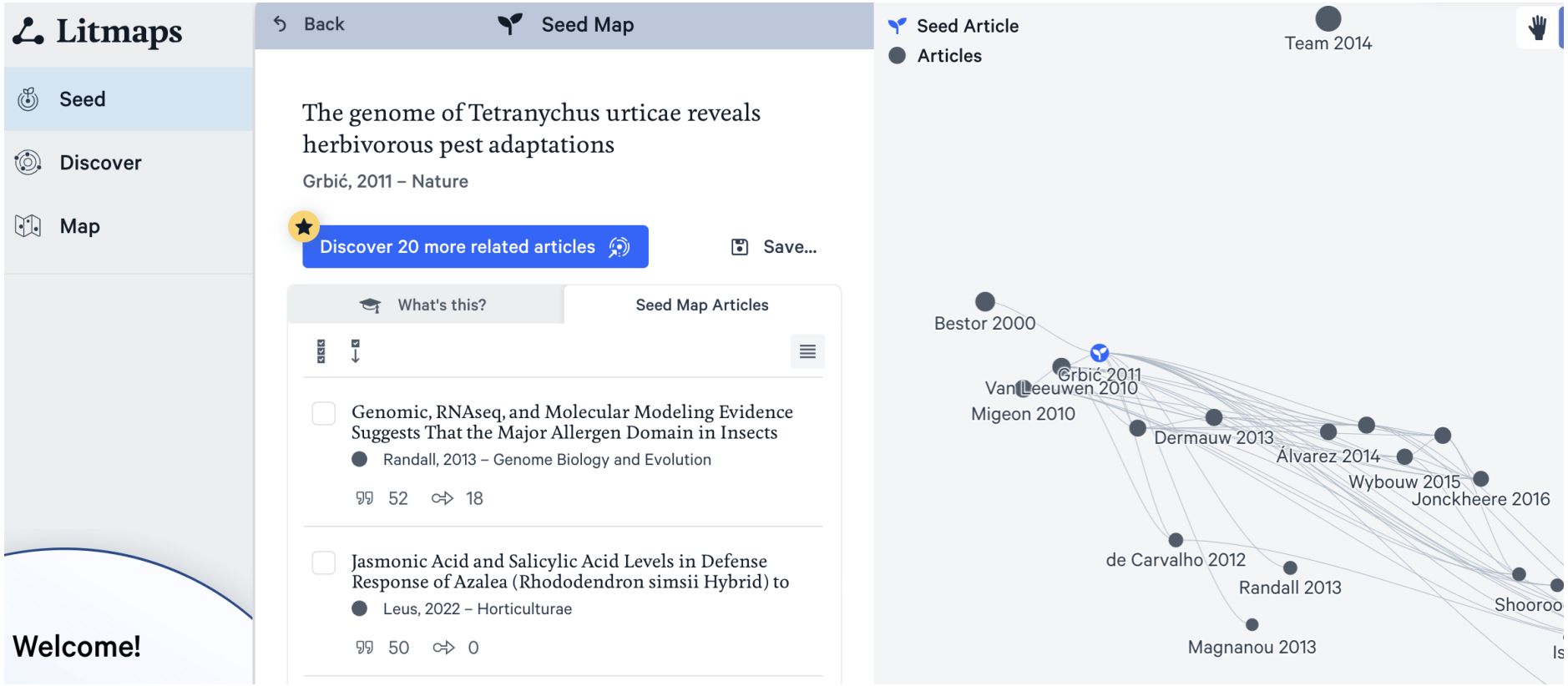


Introducing Deep Search

Generate Literature Reviews of up to 50 academic papers, using an advanced search strategy.

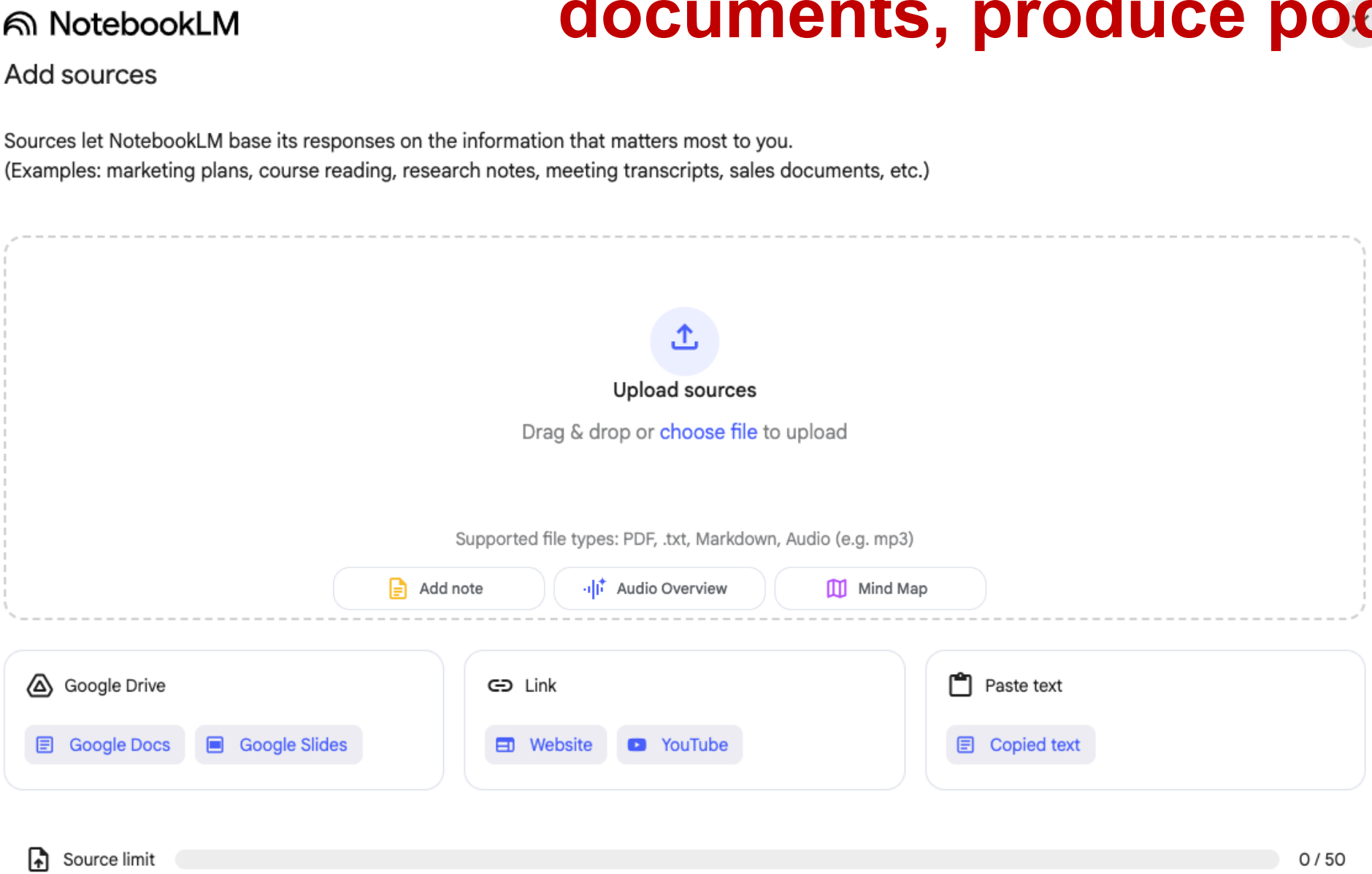
LLM + Search Engine, excels at attributed, up-to-date answers and correct citations.

ResearchRabbit



Academic literature collection through network visualization

NotebookLM: interact with documents, produce podcast



Helps to analyse, synthesize, and create content directly from *own uploaded collections of documents*, prioritising accurate citation and context-specific knowledge

Compliance



Guidance for the use of generative AI

WARWICK
THE UNIVERSITY OF WARWICK

Link to website

Guidance for the use of generative AI for PGR students

UNIVERSITY OF WARWICK

≡ School of Life Sciences

Link to website

WARWICK
THE UNIVERSITY OF WARWICK

Do not upload sensitive data



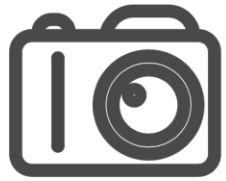
Personally identifiable information



Documents



Photos/ videos



Music



High-risk



Medical



Business



Databases

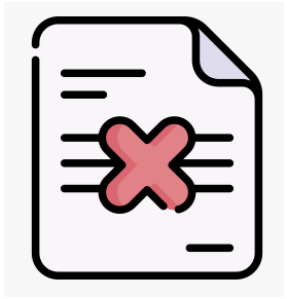


Link to website

UK Research and Innovation

Generative AI outputs must not contain:

Falsified



Fabricated



Plagiarized



Link

UK Research and Innovation

Complying with AI Usage Rules



Do not use generative AI tools as part of the assessment



Follow relevant intellectual property legislation



Do not speculate whether generative AI has been used

Link

Privacy

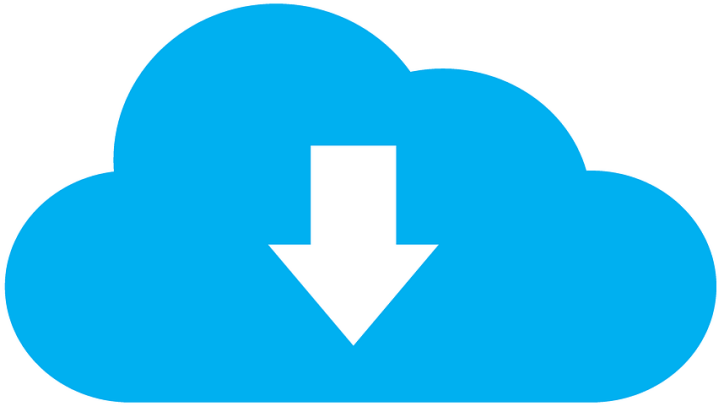
Late 2023



Personal data is being used to train AI

Few platforms allow to opt out

Early 2025



Download LLMs to your computer or phone
You can use offline

Use of AI by students



- To formulate ideas
- Feedback on writing; proofreading
- As a research tool; limitations (misinformation)

Read Warwick Proofreading Policy

Limitations



Issues with Generative AI

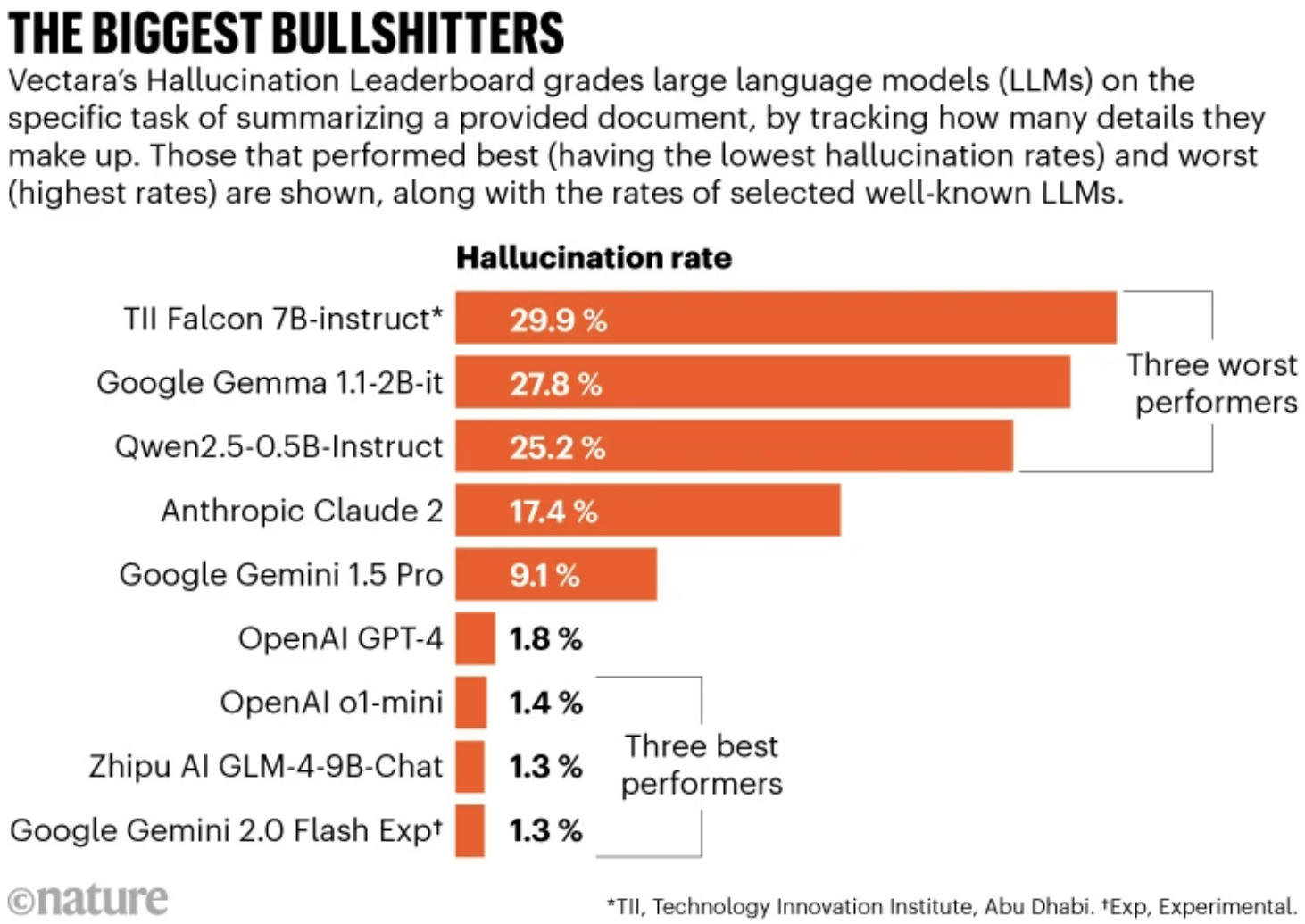
Lack of transparency



Which datasets are being used for training?

AI is not trained for accuracy

Hallucinations are built into the system



Source: Vectara (https://go.nature.com/4GPQRTT; accessed 11 January 2025)

Link

Representation of *Caenorhabditis elegans*

Real animal



2025



2026





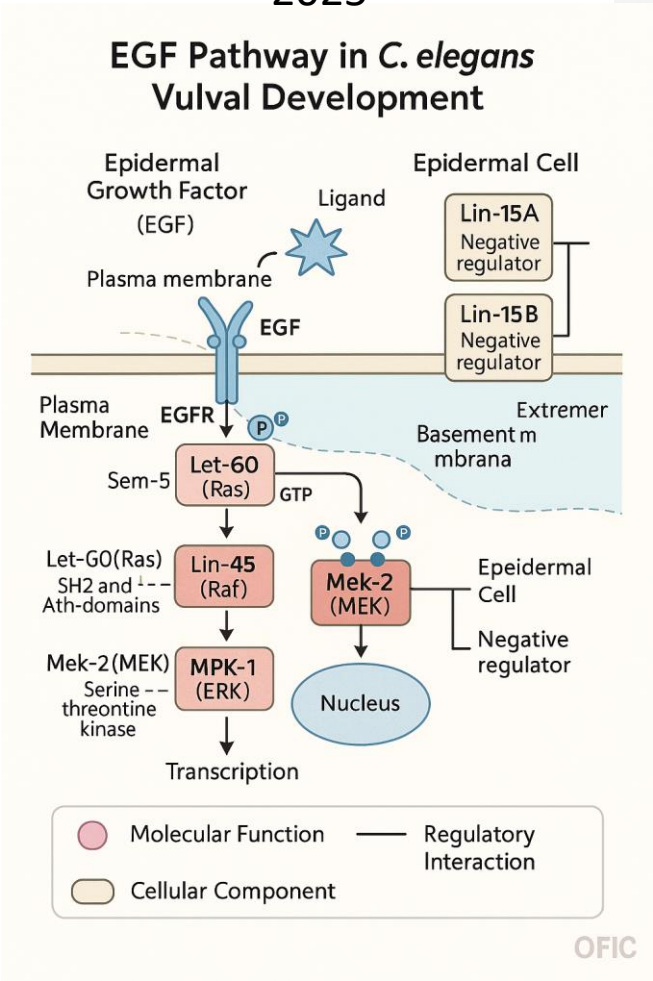


Drawing a genetic pathway

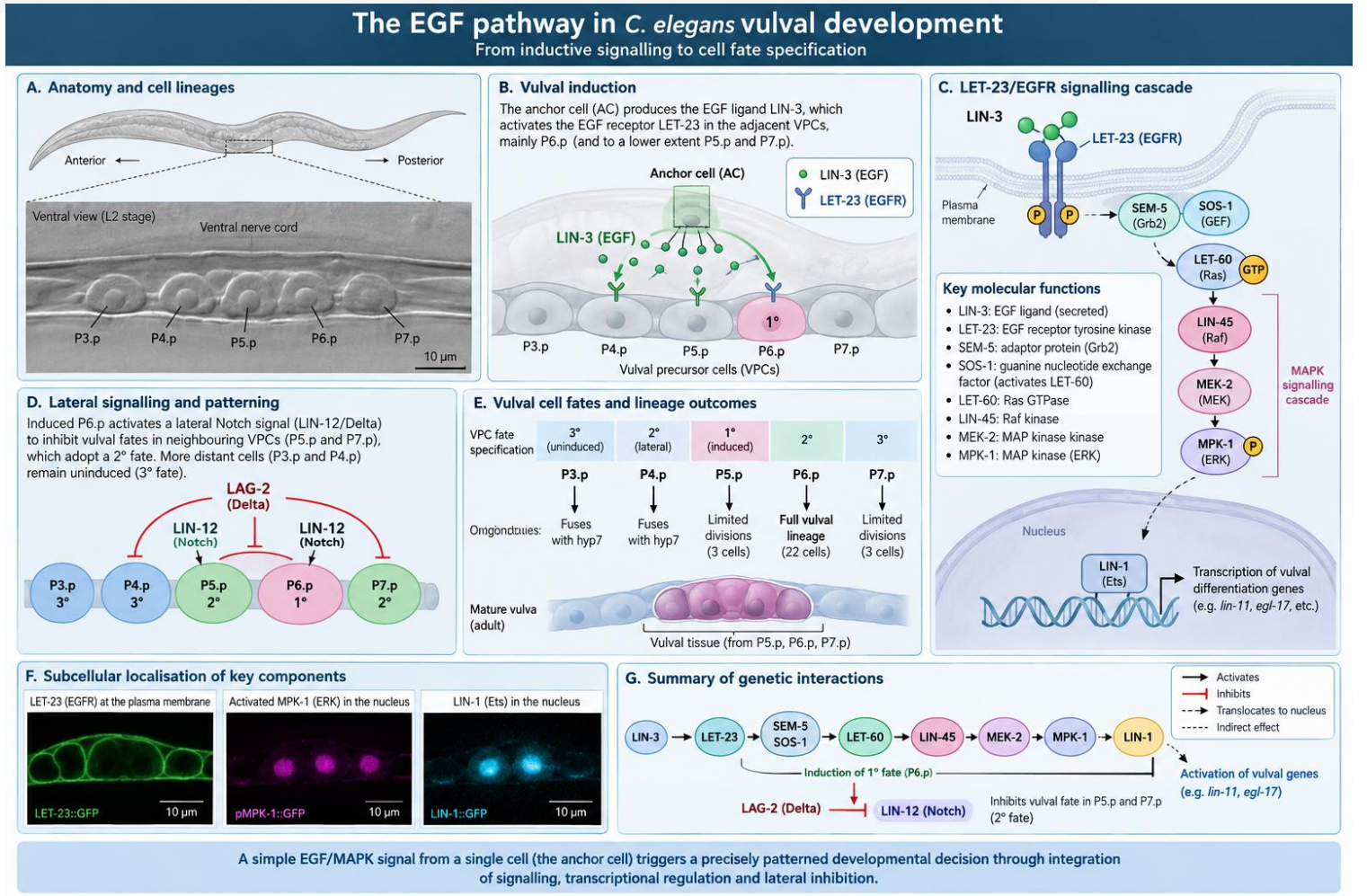
ChatGPT

2025

produce a detailed visual representation of the EGF pathway in C. elegans vulval development, including molecular functions and regulatory interactions. Show cellular components where these interactions occur.



2026



How to reduce hallucinations

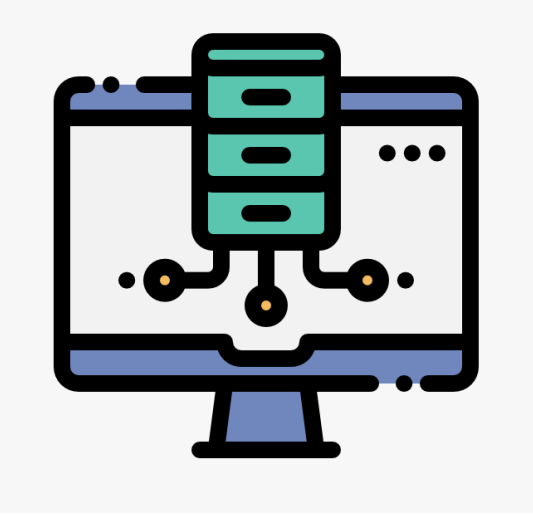
Access to online resources; fact-checking mechanisms



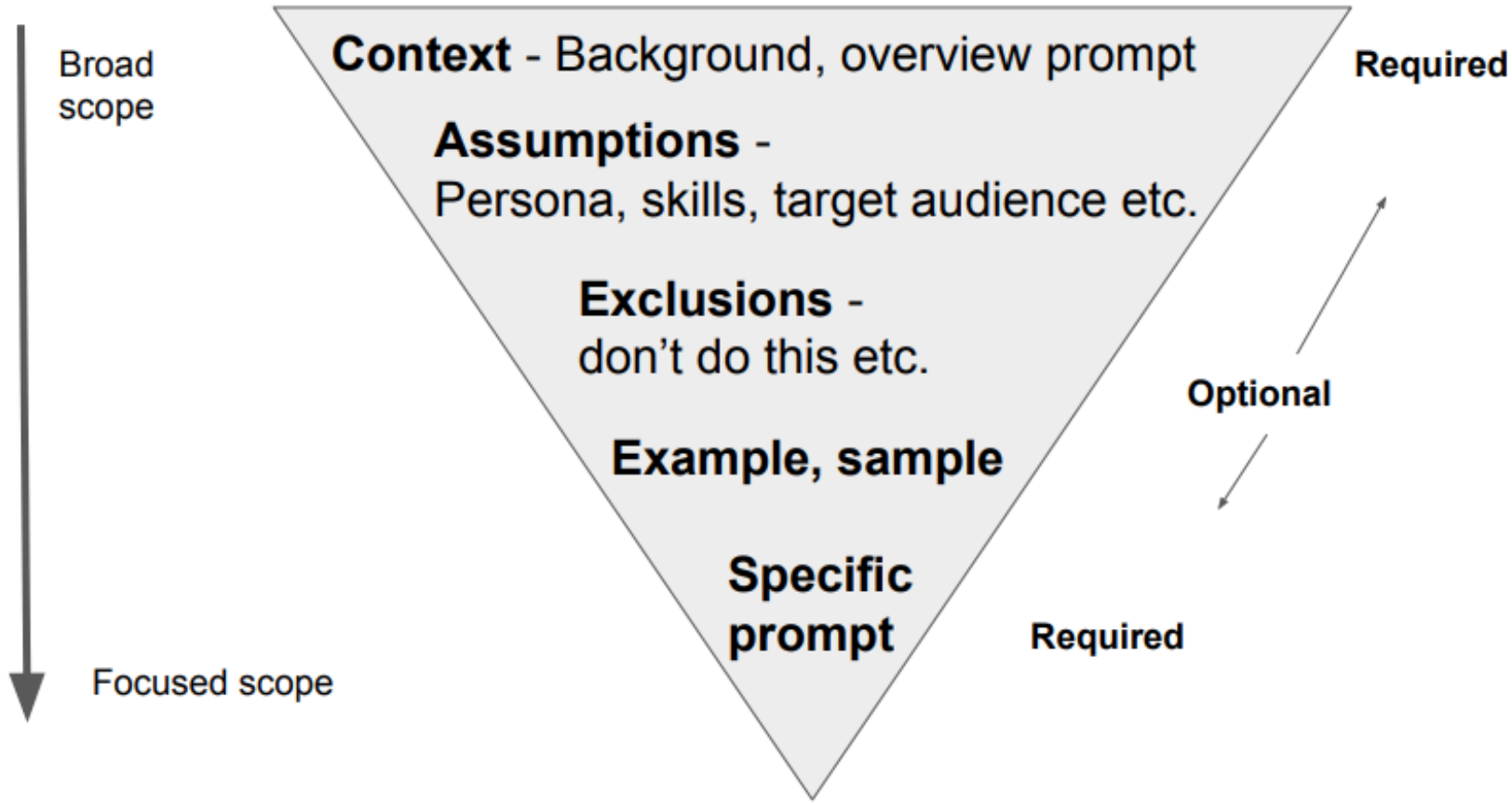
Fine-tune models to your field



Retrieval-Augmented Generation (RAG)



Recommended sequence of prompts



Example of a good prompt

Assume you're an expert and seasoned scholar with 20+ years of academic experience in [field]. On the basis of my summary of a paper in [field], where the main focus is on [general topic], provide a detailed review of this paper, in the following order: 1) briefly discuss its core content; 2) identify its limitations; and 3) explain the significance of each limitation in order of importance. Maintain a concise and professional tone throughout.

Other LLM shortcomings

Ethics



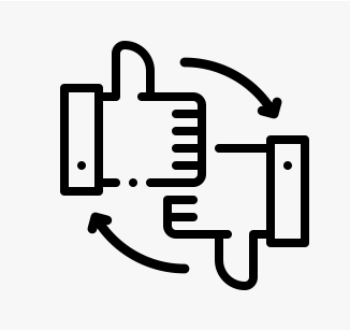
Overreliance



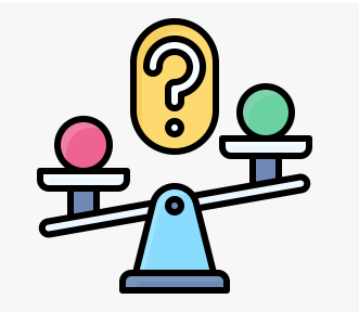
Environmental costs



Unreliable

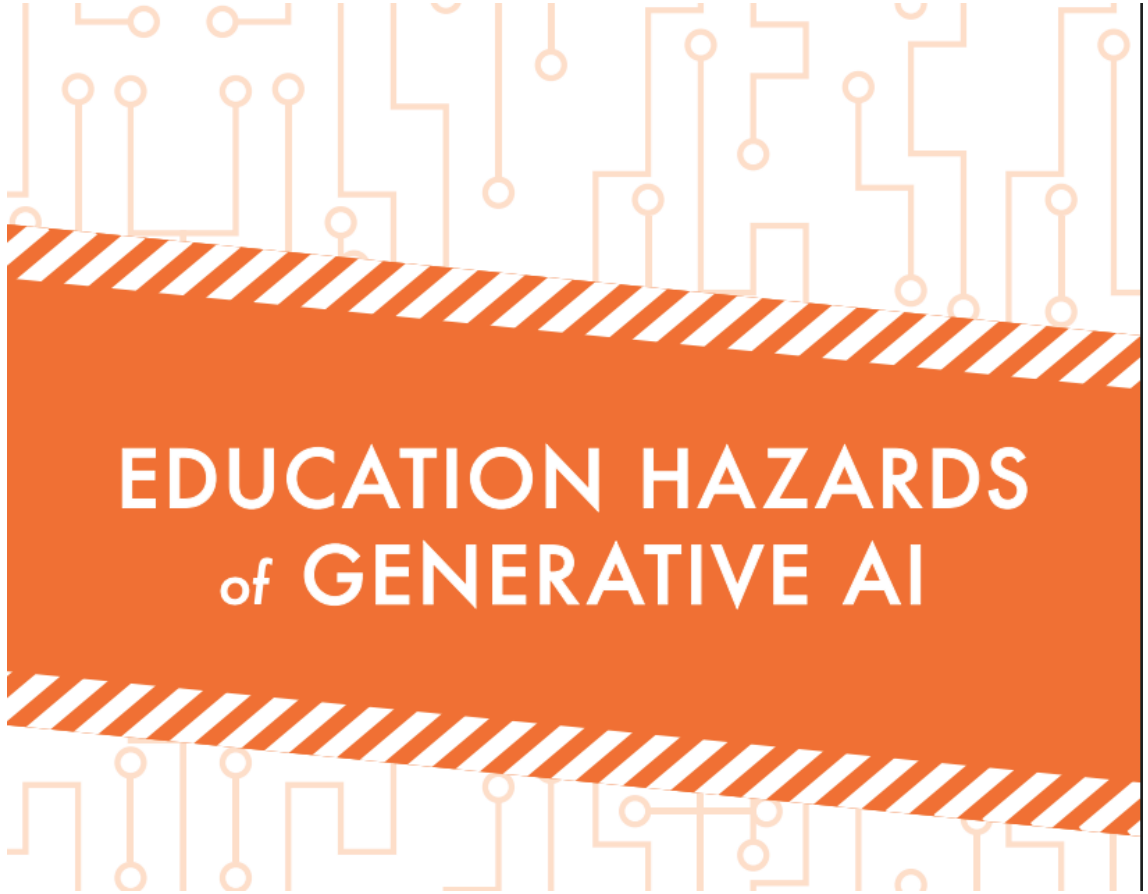


Biased



Link

Take aways



LLMs are Pattern-Matching Tools, Not Reasoning Beings

Effective LLM Use Requires Human Expertise and Oversight

Cautious and Ethical Integration is Important