



Harnessing AI in Academic Publishing

Hong Kong University of Science and Technology

3 February 2026

Jeffrey Robens, PhD
Head of Community Engagement

Springer Nature



Home of the world's leading international science journal, *Nature* (founded in 1869), *Nature Genetics*, *Nature Chemistry*, *Nature Medicine*, *Nature Materials*, *Nature Immunology*, *Nature Nanotechnology*, and more.



Springer publishes academic journals and books in all areas of academic research including science, medicine, engineering, mathematics, humanities, social science, economics and more.



One of the world's leading open access publishers, founded in 2000, BMC now publishes around 300 scientific journals in biology, medicine, and beyond, including *Genome Biology*, *BMC Biology* & *BMC Medicine*.

We publish >3000 journals

Operational >150 years

nature masterclasses



What we offer

On-demand courses



On-demand online courses

Self-paced learning in convenient bite-sized units, with videos and engaging learning activities.

Popular courses:

- [Writing a Research Paper](#)
- [Publishing a Research Paper](#)
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Live workshops

Group learning events including hands-on advice and personalised feedback in real-time.

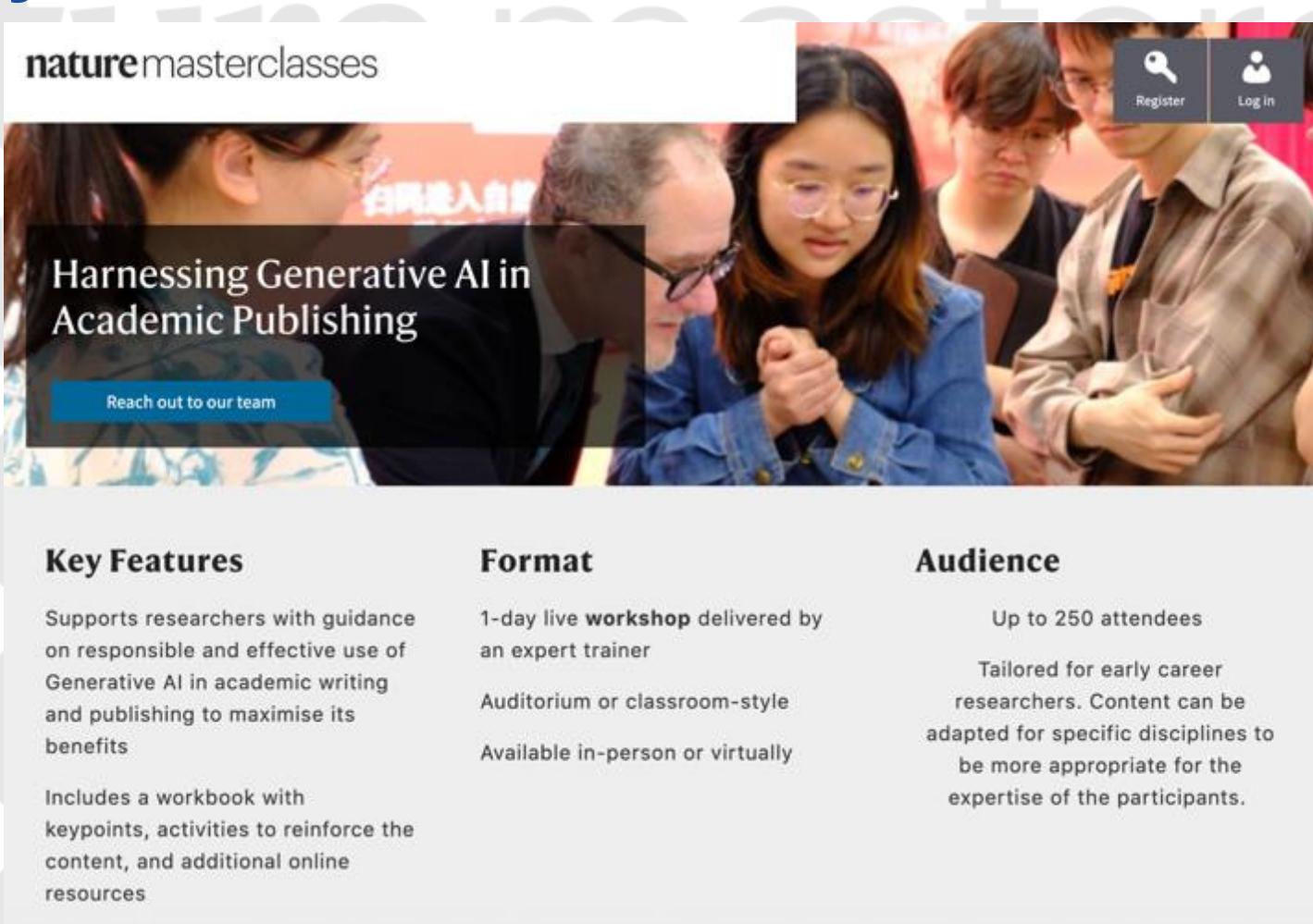
Led by Nature Portfolio Editors

[Field-specific writing & publishing training for small groups, including one-to-one abstract review](#)

Led by our Expert Trainers

[Hands-on learning for larger groups across a range of key topics](#)

Today's seminar is based on our live training



The screenshot shows a seminar page for 'Harnessing Generative AI in Academic Publishing'. At the top, the nature masterclasses logo is visible. Below it, a large image shows several people, including a man in a suit and a woman in a blue jacket, looking at a screen together. To the right of the image are 'Register' and 'Log in' buttons. The seminar title 'Harnessing Generative AI in Academic Publishing' is displayed in a large, bold font. Below the title is a blue button with the text 'Reach out to our team'. The page is divided into three main sections: 'Key Features', 'Format', and 'Audience'.

Key Features	Format	Audience
Supports researchers with guidance on responsible and effective use of Generative AI in academic writing and publishing to maximise its benefits	1-day live workshop delivered by an expert trainer Auditorium or classroom-style Available in-person or virtually	Up to 250 attendees Tailored for early career researchers. Content can be adapted for specific disciplines to be more appropriate for the expertise of the participants.
Includes a workbook with keypoints, activities to reinforce the content, and additional online resources		

Generative AI fundamentals

Using AI is becoming common

In a survey 3700+ researchers

83% using AI tools

75% said improves efficiency

81% don't full trust AI tools

Advice, technology and tools

Work



Send your careers story to: naturecareereditor@nature.com



MONEY, POLITICS AND TECH REDEFINE PHD LIFE IN 2025

Nature's global survey shows satisfaction recovering from pandemic lows, but harassment and minimal supervision remain rampant. **By Linda Nordling**

In May and June, *Nature* surveyed 3,785 PhD candidates from around the globe, exploring everything from supervision practices to workplace concerns. The results, published today, offer a window into how today's doctoral researchers are adapting to the rapidly changing circumstances in science, technology, engineering and mathematics. It's a mixed bag: candidates report feeling happier overall, but serious problems persist.

The good news? PhD satisfaction levels have bounced back from their pandemic lows

(*Nature's* most recent global PhD careers survey took place in 2022). The sobering reality? Nearly half of respondents worldwide say that they still face discrimination or harassment, and many report seeing their supervisors for less than an hour each week. Beyond these challenges, doctoral candidates consistently cite poor compensation and inadequate career guidance as major sources of dissatisfaction.

As new technologies transform how doctoral students work, one thing hasn't changed: academia continues to hold the crown as their

preferred career destination. Here's what the data reveal about the state of the doctorate in 2025.

Post-COVID recovery

Some 75% of the PhD candidates surveyed feel satisfied with their doctoral studies. This is a bounce back from 62% in 2022, and a rebound to pre-COVID levels: satisfaction levels were 71% in *Nature's* 2019 survey and 78% in 2017.

The dip in satisfaction during the pandemic makes sense to Pil Maria Saugmann, outgoing

This session is not about
making you AI experts,
but focused on how to use
Gen AI **safely** and
effectively in your work

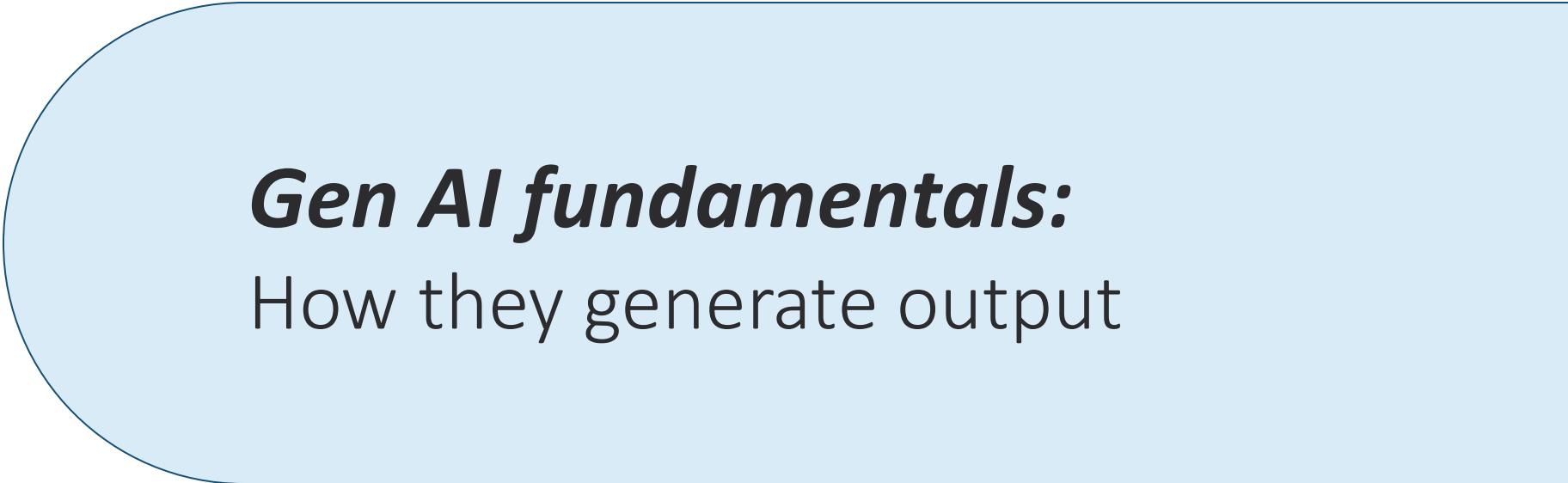


Golden rule

You are the author!

LLMs are tools to
augment, **not replace**,
your thinking



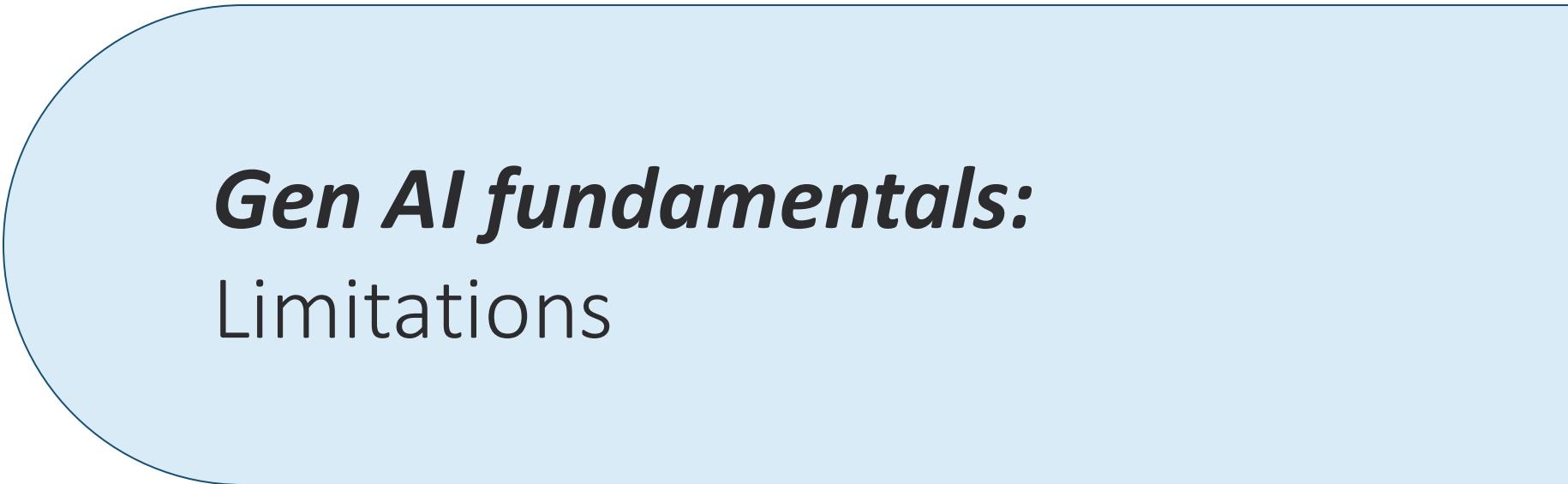


Gen AI fundamentals:

How they generate output

How Do Large Language Models Actually Generate Text?





Gen AI fundamentals:

Limitations

Gen AI has limitations

- Hallucinations / inaccuracies

Output is based on **statistical probability**, not reasoning and logic

Hallucination is **not** a mistake; it is factually inaccurate but still statistically probable

AI uses **patterns**, not facts, to generate output



Hallucinations are caused by...

Statistical probability

Randomness
(temperature and Top P)

Prompt ambiguity

Gaps in training data

Validate all output for accuracy

Based on:

- Personal knowledge
- Published literature
- Consistency across LLMs; I recommend to query 2 or 3 models and compare their outputs

As output is based on **statistical probability**, the chance that 2 or 3 models would generate the same inaccurate output is extremely low

Gen AI has limitations

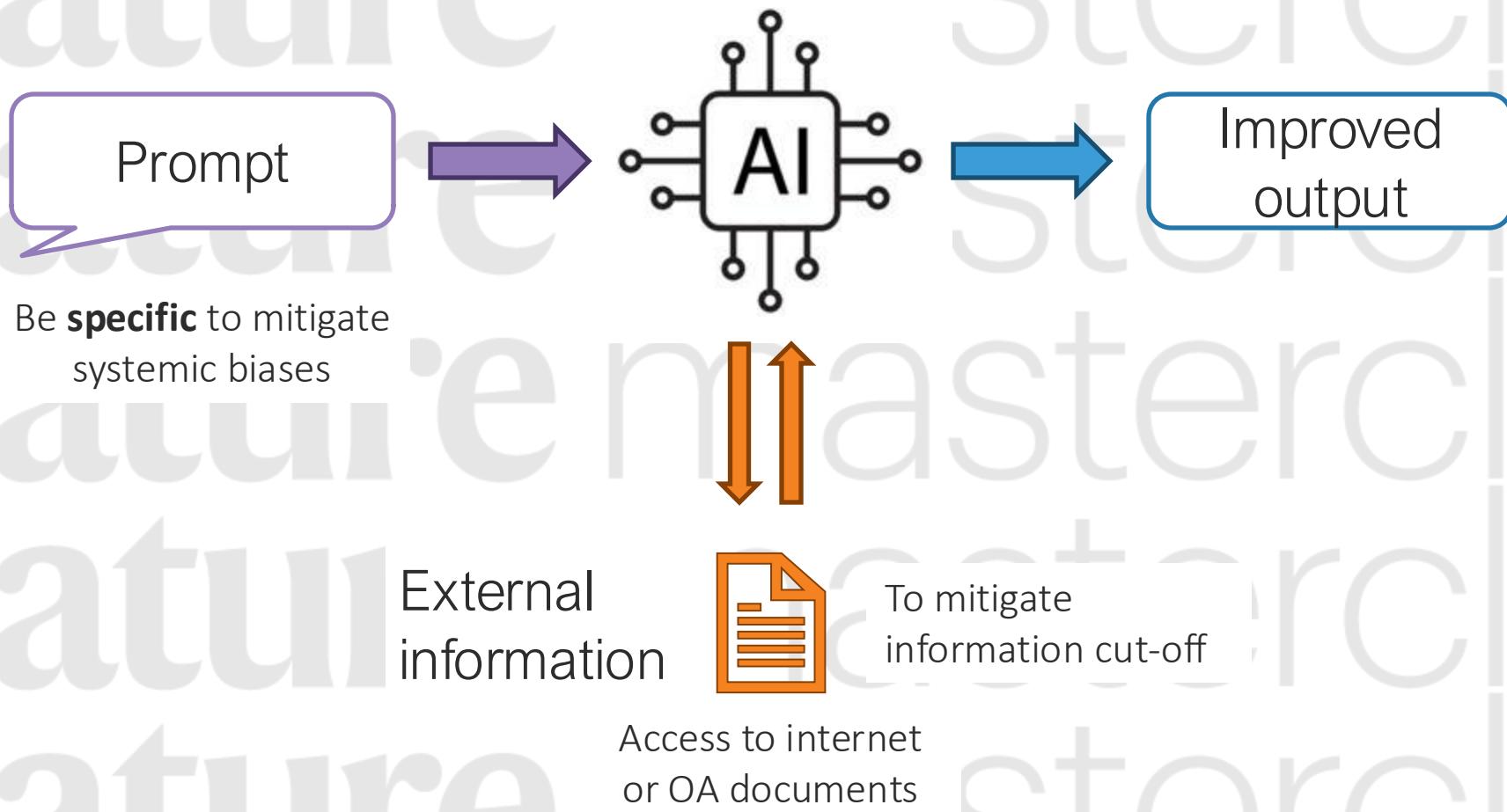
- Hallucinations / inaccuracies
- Bias reflection

Biases in the training data
will affect the output

Information and knowledge cut-off



Benefit of retrieval augmented generation (RAG)



Gen AI has limitations

- Hallucinations / inaccuracies
- Bias reflection
- Context / nuance limitations



LLMs cannot read your mind!

Ensure your prompts provide
all the necessary **context**

Ensure your prompts provide
accurate information

“Find papers discussing 3D material
applications for DBS electrodes”



Wait Jeff, do you mean 2D
material applications?

Colleagues will clarify
information, LLMs will not



Gen AI has limitations

- Hallucinations / inaccuracies
- Bias reflection
- Context / nuance limitations
- Ethical issues



Ethical issues related to Gen AI



Risk of plagiarism

Copyright issues

Data privacy

Protecting data privacy in practice

Many industries have **confidential** information that they need to protect



Uploading confidential information online has risks



Benefits of **open-weight** LLMs

Protecting data privacy in practice

nature medicine



Brief Communication

<https://doi.org/10.1038/s41591-025-03727-2>

Benchmark evaluation of DeepSeek large language models in clinical decision-making

Received: 22 February 2025

Accepted: 21 April 2025

Sarah Sandmann ¹, Stefan Hegselmann ², Michael Fujarski¹,
Lucas Bickmann ¹, Benjamin Wild ², Roland Eils ^{2,3}✉ & Julian Varghese ⁴

“Our study demonstrates that open-source LLMs can provide a scalable pathway for secure model training enabling real-world medical applications in accordance with data privacy and healthcare regulations”

Running open-weight models on your computer

Necessary software

Ollama or LM Studio

Within the software, you can then choose which LLM you would like to download (Gemma, DeepSeek, Mistral, gpt-oss, Llama, Kimi, etc.)

For most personal computers, you will need to download a smaller version of the model

(DeepSeek-R1-8b is ~ 5 GB / gpt-oss-20b is ~12 GB)

Running open-weight models on your computer

Although much smaller than the online model, it still performs basic functions quite well

Let's compare the proofreading abilities of ChatGPT-5 (online) versus gpt-oss-20b (local)

"Hybrid organic and inorganic materials have made new phenomena and solutions for specific needs in many fields of science. Tuning the composition and structure of organic and inorganic parts, with the interface between them, changes the functional properties of hybrid materials and makes them better for target use. The design of active, selective and stable catalysts is very hard problem to solve to make more sustainable society. Now, an important need is improve the stability of electrocatalysts that make CO₂ utilization by producing chemicals.."

Both performed similarly

Online

“Hybrid organic–inorganic materials have enabled the discovery of new phenomena and the development of tailored solutions across many scientific fields. By tuning the composition and structure of both components, as well as the interface between them, the functional properties of hybrid materials can be systematically controlled to meet specific application needs. One of the most pressing challenges is the design of catalysts that are not only active and selective but also stable, which is critical for building a more sustainable society. In particular, improving the stability of electrocatalysts for CO₂ conversion into value-added chemicals remains a key priority.”

Local

“Hybrid organic–inorganic materials have emerged as versatile platforms that enable new phenomena and tailored solutions across many scientific disciplines. By precisely tuning the composition, nanostructure, and interfacial chemistry of their constituent phases, one can modulate the functional properties of these hybrids to meet specific performance targets. Designing catalysts that are simultaneously active, selective, and stable remains a formidable challenge toward realizing a sustainable society. In particular, the long-term stability of electrocatalysts for CO₂ reduction is a critical bottleneck; improving it would accelerate the deployment of CO₂ utilization technologies.”

Let's examine one sentence

Original

“...The design of active, selective and stable catalysts is very hard problem to solve to make more sustainable society...”

GPT-5

“...One of the most pressing challenges is the design of catalysts that are not only active and selective but also stable, which is critical for building a more sustainable society...”

gpt-oss

“...Designing catalysts that are simultaneously active, selective, and stable remains a formidable challenge toward realizing a sustainable society...”

Gen AI has limitations

- Hallucinations / inaccuracies
- Bias reflection
- Context / nuance limitations
- Ethical issues



Does using Gen AI affect our creativity?



Several studies have looked at this...

Article

Artificial intelligence tools expand scientists' impact but contract science's focus

nature human behaviour

Article <https://doi.org/10.1038/s41562-024-01953-1>

An empirical investigation of the impact of ChatGPT on creativity

Journal of Creativity 34 (2024) 100072
Contents lists available at ScienceDirect
Journal of Creativity
journal homepage: www.elsevier.com/locate/joc
 

The results are quite consistent:

- Human-AI collaboration slightly **increases** creativity/ideation and productivity compared with human alone
- However, ideas are **safer** with lower risk (fewer radical ideas)
- **Diversity** of ideas is reduced (convergence of ideas)

Recommendations (4-step process)

1. **Human only:** Start with human-only brainstorming
2. **AI collaborator:** Then use AI collaboration to add new ideas (emphasize distinct from current set of ideas to prevent convergence)
3. **AI critic:** Have a different AI model review your list of ideas and give additional suggestions, give counter-arguments, and highlight limitations
4. **Human review:** Review and validate output for accuracy and authenticity

Always provide
human oversight

1

When to use Gen AI

2

Which model to use

3

Write **clear** prompts

4

Validate all outputs



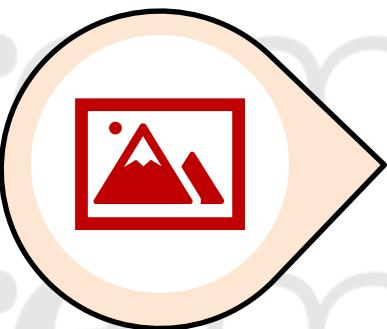


Gen AI fundamentals: Editorial policies

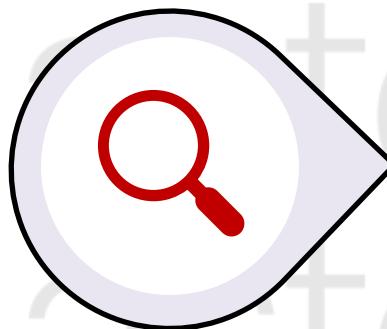
Editorial policies



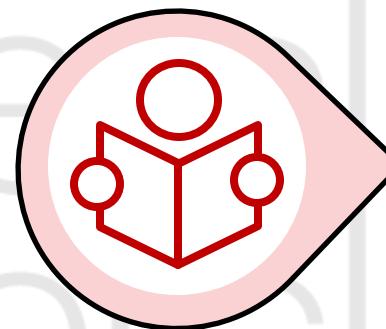
AI
Authorship



Generative
AI images



AI
Transparency



AI in peer
review

Editorial policies



AI
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Generative
AI images



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Transparency



AI in peer
review

Is it okay to list Gen AI as an author?



Nurse Education in Practice
Volume 66, January 2023, 103537

Editorial

Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse?

Siobhan O'Connor^{a,1}  , ChatGPT^b 

No

No, for most publishers

nature portfolio

“Large Language Models (LLMs), such as ChatGPT, do not currently satisfy our authorship criteria. Notably an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs.”

<https://www.nature.com/nature-portfolio/editorial-policies/ai>

Editorial policies



AI

Authorship

Generative
AI images



AI

Transparency



AI in peer
review

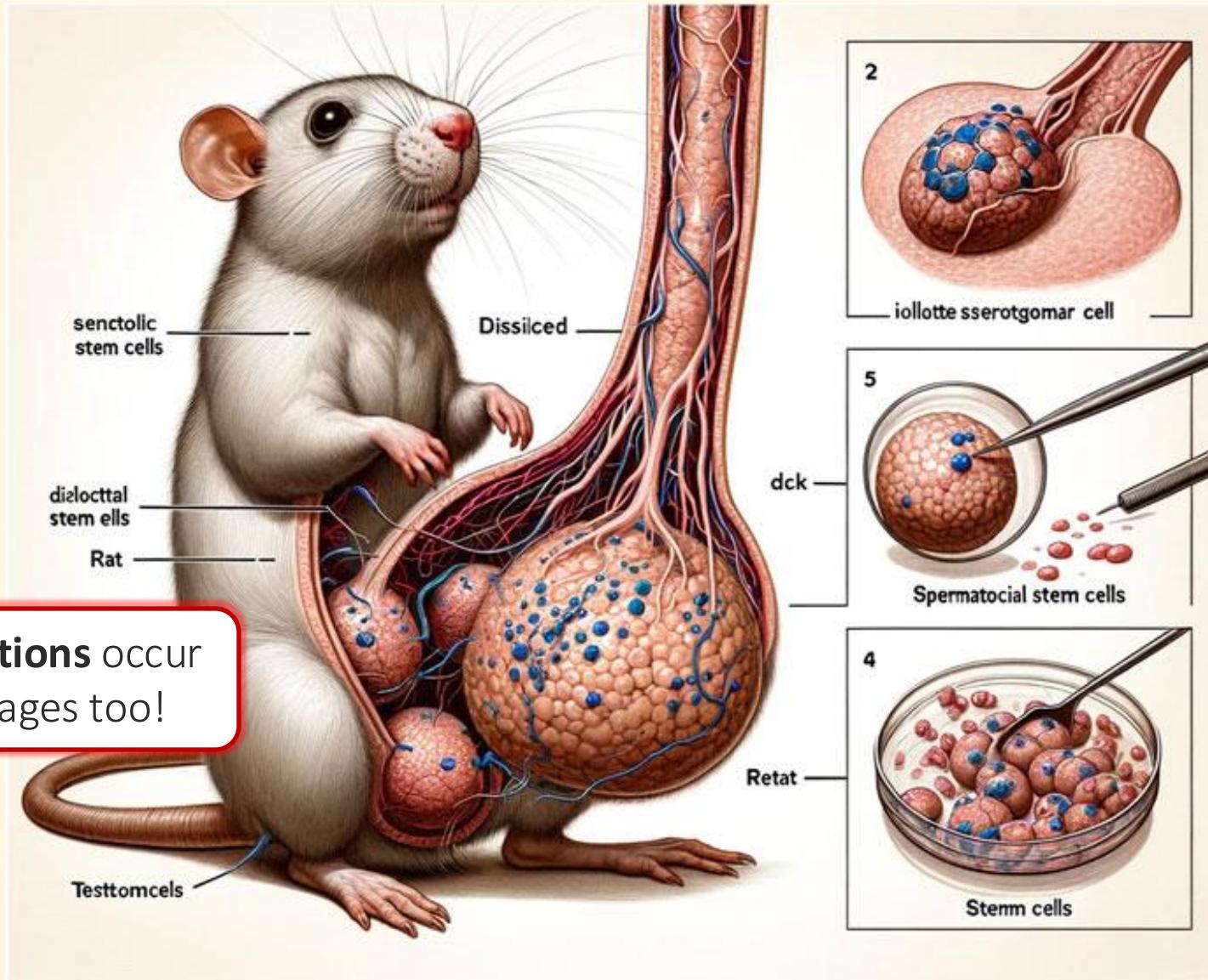
No, for most publishers

nature portfolio

“While **legal issues** relating to AI-generated images and videos remain broadly unresolved, Springer Nature journals are **unable to permit** its use for publication..”

<https://www.nature.com/nature-portfolio/editorial-policies/ai>

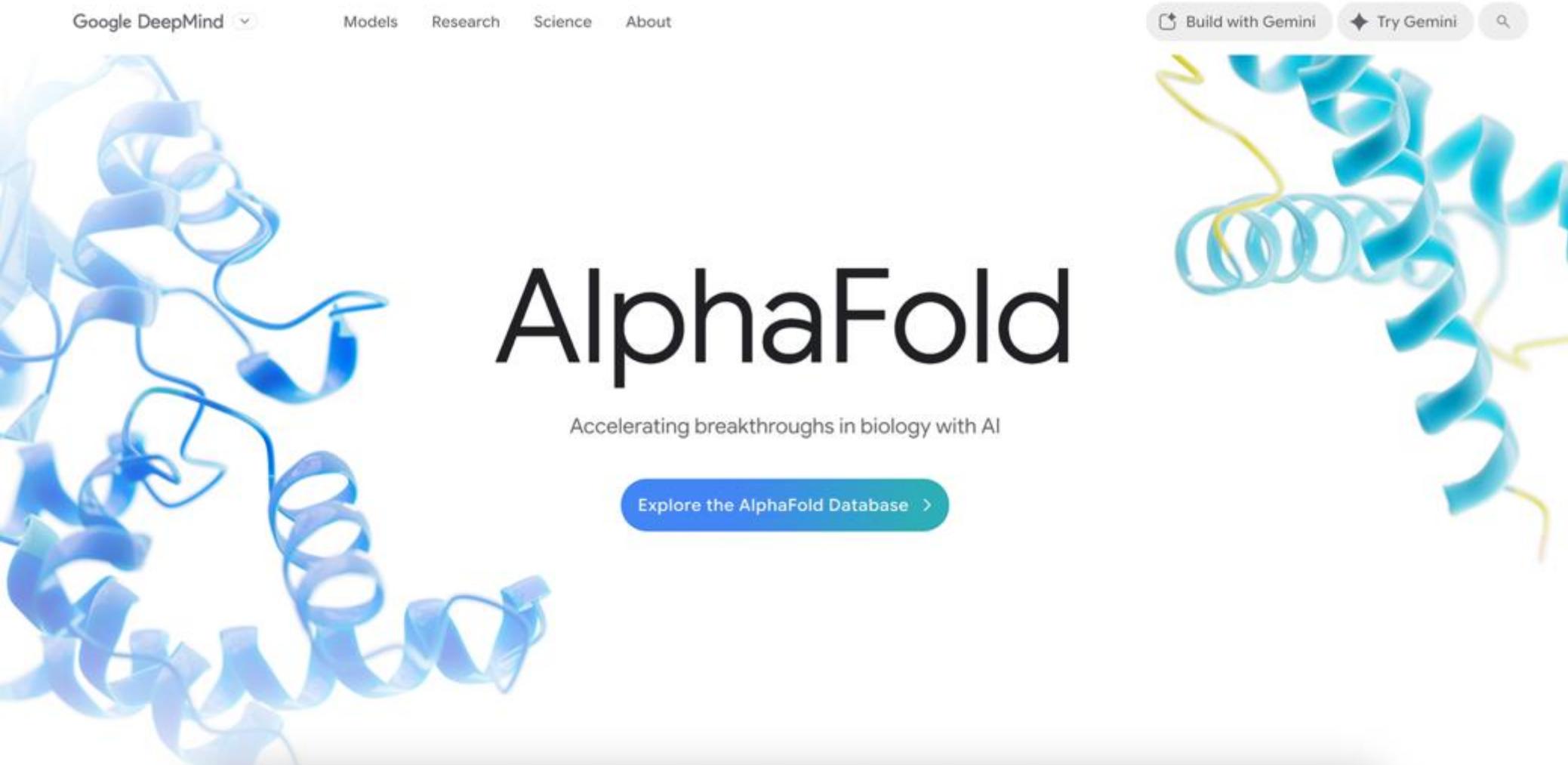
We don't want images like this!



Case-by-case exceptions...

- Images / videos directly reference in **AI-specific** or related manuscripts
- Images / art from **contracted agencies** that comply with the legal standards
- Images enhanced / manipulated using **non-generative AI tools** with disclosure in caption

AlphaFold from Google is a good example of AI-generated images that are acceptable



What about graphs and tables?

“Not included in this policy are text-based and numerical display items, such as: tables, flow charts and other simple graphs that do not contain images.”

<https://www.springernature.com/gp/policies/book-publishing-policies>

It is okay to use Gen AI to help prepare any figures that do **not** contain images (with disclosure, like other graphical software)

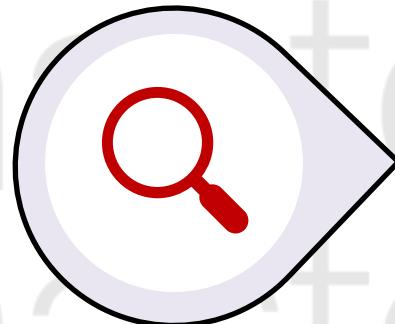
Editorial policies



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Disclosure of Gen AI use varies by publisher

Publisher	Disclosure for spelling & grammar	Disclosure for readability	Disclosure for other use
Springer Nature	✗	✗	✓
Science	✗	✗	✓

Resisting AI slop

H. HOLDEN THORP [Authors Info & Affiliations](#)

SCIENCE • 1 Jan 2026 • Vol 391, Issue 6780 • p. 5 • DOI: 10.1126/science.aae8267

11,781

“Science’s most recent policies allow the use of large language models for certain processes without any disclosure, such as editing the text in research papers to improve clarity and readability or assisting in the gathering of references.”

It’s hard to talk about any topic in science or education today without the subject of artificial intelligence (AI) coming up—whether large language models should be allowed to aid in searching for a scientific paper or even to write or review the paper itself. In some of the wildest speculations, the humans involved in conducting scientific studies and experiments and vetting the results for publication will be steadily eliminated from the process. But when such grandiose rhetoric starts flying, we at *Science* try to keep calm and carry on in contributing to a robust, human-curated research literature that will stand the test of time.

Science’s most [recent policies](#) allow the use of large language models for certain processes without any disclosure, such as editing the text in research papers to improve clarity and readability or assisting in the gathering of references. However, the use of AI beyond that—for example, in drafting manuscript text—must be declared. And the

Updated on 1 January 2026

Disclosure of Gen AI use varies by publisher

Publisher	Disclosure for spelling & grammar	Disclosure for readability	Disclosure for other use
Springer Nature	✗	✗	✓
Science	✗	✗	✓
Elsevier	✗	✓	✓
Wiley	✗	✓	✓
Taylor & Francis	✓	✓	✓

**But don't let LLMs
write your paper!**



Don't have LLMs write your paper



This is **your** paper

People want to
know what **you**
think!



Writing helps you:

- Slow down your thinking
- Organize your thoughts
- Reflect and clarify them
- Better understand them

Don't have LLMs write your paper



This is **your** paper

People want to
know what **you**
think!



Increases risk of
plagiarism

Don't have LLMs write your paper

CAUTION

Be careful of **hallucinations**

Validate all output from LLMs

RTCNCA / CC BY-SA 3.0

Bad example

nature masterclasses

Introduction

Certainly, here is a possible introduction for your topic: Lithium-metal batteries are promising candidates for high-energy-density rechargeable batteries due to their low electrode potentials and high theoretical capacities [1], [2]. However, during the cycle, dendrites forming on the lithium metal anode can cause a short circuit, which can affect the safety and life of the battery [3], [4], [5], [6], [7], [8], [9]. Therefore, researchers are indeed focusing on various aspects such as negative electrode structure [10], electrolyte additives [11], [12], SEI film construction [13], [14], and collector modification [15] to inhibit the formation of lithium dendrites. However, using a separator with high mechanical strength and chemical stability is another promising approach to prevent dendrites from infiltrating the cathode. By incorporating a separator with high mechanical strength, it can act as a physical barrier to impede the growth of dendrites. This barrier can withstand the mechanical stress exerted by the dendrites during battery operation, preventing them from reaching the cathode and causing short circuits or other safety issues. Moreover, chemical stability of the separator is equally important as it ensures that the

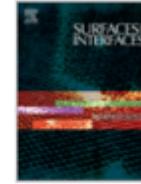
Bad example

nature masterclasses



Surfaces and Interfaces

Volume 46, March 2024, 104081



RETRACTED: The three-dimensional porous mesh structure of Cu-based metal-organic-framework - Aramid cellulose separator enhances the electrochemical performance of lithium metal anode batteries

Manshu Zhang ^a ¹, Liming Wu ^a ¹, Tao Yang ^b, Bing Zhu ^a, Yangai Liu ^a

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<https://doi.org/10.1016/j.surfin.2024.104081>

Bad example

nature masterclasses

This article has been retracted at the request of the Editors-in-Chief and Authors.

The journal was alerted to the presence of duplicate images appearing as Figures 1 and 2 of this article and Figures 1 and 2 of International Journal of Hydrogen Energy, Volume 59 (2024), Pages 263–271, <https://doi.org/10.1016/j.ijhydene.2024.01.283>.

An investigation by the journal confirmed substantial duplication of text and image data between these two articles that were submitted and published in close succession. All authors of the International Journal of Hydrogen Energy article also authored the Surfaces and Interfaces article.

In addition, there are concerns that the authors appear to have used a Generative AI source in the writing process of the paper without disclosure, which is a breach of journal policy.

The journal sincerely regrets that these issues were not detected during the manuscript screening and evaluation process and apologies are offered to readers of the journal.

Editorial policies



AI
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Generative
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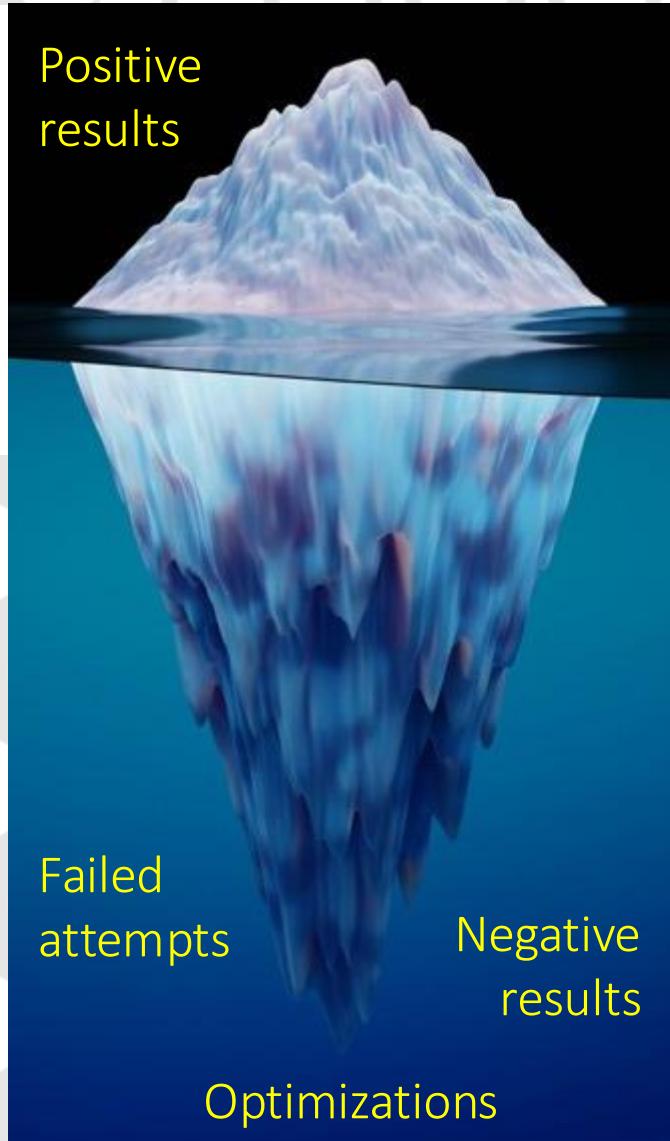
No, for most publishers

nature portfolio

“...generative AI tools have considerable limitations... Manuscripts may also include sensitive or proprietary information that should not be shared outside the peer review process. For these reasons we ask that, while Springer Nature explores providing our peer reviewers with access to safe AI tools, peer reviewers do not upload manuscripts into generative AI tools.”

Gen AI vs researchers

- Gen AI is **limited** by its training data
- **Biased** towards positive results in published articles



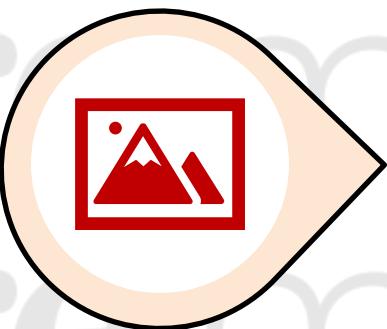
nature masterclasses

- Researchers have **broader** experience
- Editors choose reviewers based on their subject and **technical** expertise

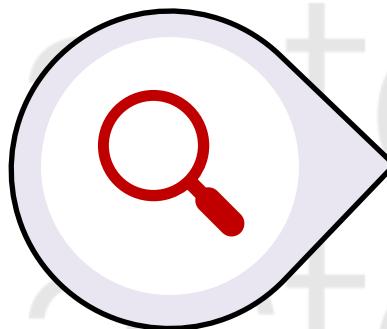
Editorial policies



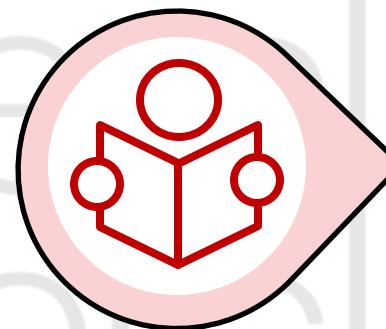
AI
Authorship



Generative
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AI
Transparency



AI in peer
review

Publishers are also developing AI tools

SPINGER NATURE

About Us Our Communities Taking Responsibility Artificial Intelligence Media Careers Investors

Media Centre

PRESS RELEASES



Springer Nature unveils two new AI tools to protect research integrity

Geppetto and SnappShot playing important role in stopping fake research from being published

London | Berlin | New York 12th June 2024

SPINGER NATURE

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Media Centre

PRESS RELEASES



New research integrity AI tool added to Springer Nature's growing portfolio

London | Berlin | New York, 7 April 2025

What kinds of tools?

Using AI-tools for research integrity

- 1 Tool to detect AI-generated **text**
- 2 Tool to detect irrelevant **references**

Write clear (structured) prompts

<role>

Act as an expert research assistant specializing in the microbiome and human health.

</role>

<task>

Identify recently published high-impact papers demonstrating trends in microbiome research, especially as it relates to metabolic health and healthy aging.

</task>

<context>

- I am developing a 12-minute presentation that focuses on microbiome science and healthy aging, whose research spans in vitro studies, animal models, and human clinical trials.
- My presentation should follow this narrative arc: (1) Latest research and publication trends in microbiome science and human health, (2) Extension into probiotics research related to metabolic health and healthy aging, and (3) Translational implications of these findings for human health and microbiome applications.

</context>

<instructions>

- Identify 3-5 high-impact publications from *Nature*, *Nature Medicine*, *Nature Aging*, *Nature Metabolism*, or *Nature Microbiology* for each of the above three sections of my presentations.
- The articles should include a mixture of preclinical and clinical studies.
- The articles should be published between 2022 and 2025.
- Provide links for each of the articles.
- Do NOT find articles from other journals.
- Do NOT fabricate articles or citations.
- Do NOT find articles that do not fit into the narrative arc of the presentation.

</instructions>

<output>

- Summarize the key trends in bullet points for EACH of the 3 sections of my presentation based ONLY on the identified papers.
- Generate a table with the title of each paper representing a row, and with the columns describing: published journal, publication year, link to the article, section of the presentation relevant for, research problem the study was addressing, key finding of the study, impactful implications of the study for human health.

</output>

Write clear (structured) prompts

<role>

Act as an expert research assistant specializing in the microbiome and human health.

</role>

<task>

Identify recently published high-impact papers related to microbiome science and healthy aging.

</task>

<context>

- I am developing a 12-minute presentation that focuses on microbiome science and healthy aging, whose research spans in vitro studies, animal models, and human clinical trials.

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</output>

Give a clear **role** to the AI model

Write clear (structured) prompts

<role>

Act as an expert research assistant specializing in the microbiome and human health.

</role>

<task>

Identify recently published high-impact papers demonstrating trends in microbiome research, especially as it relates to metabolic health and healthy aging.

</task>

<context>

- I am developing a 12-minute presentation that focuses on the latest trends in microbiome research. This research spans in vitro studies, animal models, and human clinical trials.

- My presentation should follow this narrative arc: (1) Latest research and publication trends in microbiome science and human health, (2) Extension into probiotics research related to metabolic health and healthy aging, and (3) Translational implications of these findings for human health and microbiome applications.

</context>

<instructions>

- Identify 3-5 high-impact publications from *Nature*, *Nature Medicine*, *Nature Aging*, *Nature Metabolism*, or *Nature Microbiology* for each of the above three sections of my presentations.

- The articles should include a mixture of preclinical and clinical studies.

- The articles should be published between 2022 and 2025.

- Provide links for each of the articles.

- Do NOT find articles from other journals.

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</output>

Give a specific **task**

Write clear (structured) prompts

<role>

Act as an expert research assistant specializing in the microbiome and human health.

</role>

<task>

Identify recently published high-imp

metabolic health and healthy aging.

</task>

<context>

- I am developing a 12-minute presentation that focuses on microbiome science and healthy aging, whose research spans in vitro studies, animal models, and human clinical trials.
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</context>

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- Provide links for each of the articles.
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</output>

Give relevant **background** information

Write clear (structured) prompts

<role>

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</role>

<task>

Identify recently published high-impact papers demonstrating trends in microbiome research, especially as it relates to metabolic health and healthy aging.

</task>

<context>

- I am developing a 12-minute presentation that focuses on microbiome science and healthy aging, whose research spans in vitro studies, animal models, and human clinical trials.
- My presentation should follow this narrative arc: (1) Latest research and publication trends in microbiome science and human health, (2) Extension into probiotics research related to metabolic health and healthy aging, (3) Summary of key findings for human health and microbiome applications.

</context>

Give specific **instructions**

<instructions>

- Identify 3-5 high-impact publications from *Nature*, *Nature Medicine*, *Nature Aging*, *Nature Metabolism*, or *Nature Microbiology* for each of the above three sections of my presentations.
- The articles should include a mixture of preclinical and clinical studies.
- The articles should be published between 2022 and 2025.
- Provide links for each of the articles.
- Do NOT find articles from other journals.
- Do NOT fabricate articles or citations.
- Do NOT find articles that do not fit into the narrative arc of the presentation.

</instructions>

<output>

- Summarize the key findings of the articles.

- Generate a table or figure that highlights the key findings and their implications for human health.

What you want it to **do** and what you **don't** want it to do

section of the presentation relevant to the research problem the study was addressing, key finding of the study, and potential implications of the study for human health.

</output>

Write clear (structured) prompts

<role>

Act as an expert research assistant specializing in the microbiome and human health.

</role>

<task>

Identify recently published high-impact papers demonstrating trends in microbiome research, especially as it relates to metabolic health and healthy aging.

</task>

<context>

- I am developing a 12-minute presentation that focuses on microbiome science and healthy aging, whose research spans in vitro studies, animal models, and human clinical trials.
- My presentation should follow this narrative arc: (1) Latest research and publication trends in microbiome science and human health, (2) Extension into probiotics research related to metabolic health and healthy aging, and (3) Translational implications of these findings for human health and microbiome applications.

</context>

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</instructions>

Any specific **guidelines** for the **output**

<output>

- Summarize the key trends in bullet points for EACH of the 3 sections of my presentation based ONLY on the identified papers.
- Generate a table with the title of each paper representing a row, and with the columns describing: published journal, publication year, link to the article, section of the presentation relevant for, research problem the study was addressing, key finding of the study, impactful implications of the study for human health.

</output>

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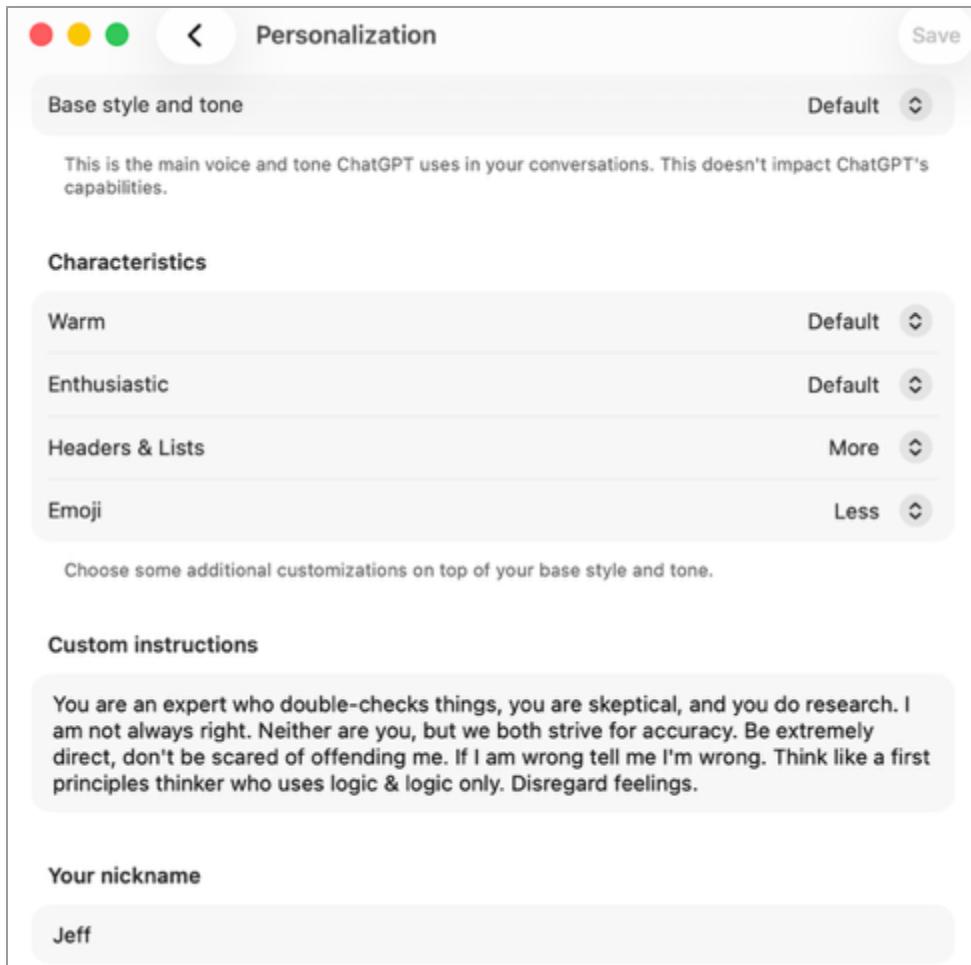
</output>

Output

Article (Year)	Journal	Research Question	Key Findings	Implications for Human Health
Gut micro-organisms associated with health, nutrition and dietary interventions (2025)	Nature	How do diet and the gut microbiome jointly influence cardiometabolic health in a large population?	In >34,000 adults (US/UK), the study identified gut microbe species consistently linked to diet quality and health markers (like BMI, blood lipids, inflammation). It created a “Microbiome Health Ranking” of beneficial vs. harmful microbes, and showed that in two dietary intervention trials, participants’ good bacteria increased and bad bacteria decreased with a healthier diet .	Confirms on a huge scale that diet–microbiome interactions are critical to cardiometabolic health. The ranking of microbes provides targets for future probiotics or dietary strategies. However, causation isn’t yet proved , highlighting the need for intervention studies to see if changing these microbes can improve human health.
Longevity of centenarians is reflected by the gut microbiome with youth-associated signatures (2023)	Nature Aging	What distinguishes the gut microbiomes of centenarians, and how does it relate to healthy aging?	In a cohort of 297 centenarians (and younger controls), extreme longevity was associated with “youthful” microbiome traits: centenarians had a <i>Bacteroides</i> -dominated enterotype, higher microbial diversity and more beneficial <i>Bacteroidetes</i> , with fewer potential pathogens . Longitudinal sampling suggested that centenarians who maintained higher microbiome evenness had more stable health .	Identifies microbial signatures of healthy aging – e.g. certain beneficial bacteria and diversity may contribute to longevity. This suggests that preserving or restoring a “youth-like” microbiome (via diet, probiotics, or FMT) could promote healthy aging and resilience in older adults, though intervention trials are needed.
Gut microbiome strain-sharing within isolated village social networks (2025)	Nature	How do social relationships affect the gut microbiome’s composition at strain level?	Studying ~1,800 people in remote villages, researchers found significant sharing of gut bacterial strains among community members – not just within households or families, but even among friends and neighbors who interact frequently . Socially central individuals harbored microbiomes more similar to the broader community, and connected people’s microbiomes converged over 2 years .	Reveals that the microbiome can be transmissible through social contact. Public health-wise, this means our social environment is an underappreciated factor in microbiome and disease risk. It suggests that interventions like community probiotic programs or improved sanitation could have network effects on microbiome health.
Gut microbiome-mediated transformation of dietary phytonutrients is associated with health outcomes (2025)	Nature Microbiology	How extensively do gut bacteria metabolize plant-based nutrients, and does this affect host health?	By analyzing 3,068 gut metagenomes worldwide, the study mapped 775 dietary phytonutrients to gut bacterial enzymes, finding ~70% of these microbial enzymes potentially transform diet molecules . It showed that mice benefit from a healthy plant diet only if certain microbial genes are active, and that disease cohorts lack some of these metabolic functions . Machine learning could even distinguish healthy vs. sick individuals based on their microbiome’s capacity to process phytonutrients.	Demonstrates that the microbiome’s biochemical capacity is integral to nutrition. People with the “right” microbes get more benefit from fruits and vegetables. This paves the way for personalized nutrition or probiotic interventions – e.g. enriching someone’s gut with microbes that produce beneficial metabolites (or providing the metabolites directly) could improve dietary therapy for chronic diseases.

...and 7 more articles from *Nature*, *Nature Medicine*, and *Nature Microbiology*

Personalize your output



The screenshot shows the 'Personalization' settings in the ChatGPT interface. At the top, there are three colored window control buttons (red, yellow, green) and a back arrow. The title 'Personalization' is centered above a 'Save' button. Below the title, 'Base style and tone' is set to 'Default'. A note states: 'This is the main voice and tone ChatGPT uses in your conversations. This doesn't impact ChatGPT's capabilities.' Under 'Characteristics', 'Warm' is set to 'Default', 'Enthusiastic' is set to 'Default', 'Headers & Lists' is set to 'More', and 'Emoji' is set to 'Less'. A note below these says: 'Choose some additional customizations on top of your base style and tone.' Under 'Custom instructions', there is a text box containing the following text: 'You are an expert who double-checks things, you are skeptical, and you do research. I am not always right. Neither are you, but we both strive for accuracy. Be extremely direct, don't be scared of offending me. If I am wrong tell me I'm wrong. Think like a first principles thinker who uses logic & logic only. Disregard feelings.' At the bottom, 'Your nickname' is set to 'Jeff'.

“You are an expert who double-checks things, you are sceptical, and you do research. I am not always right. Neither are you, but we both strive for accuracy. Be extremely direct, don't be scared of offending me. If I am wrong tell me I'm wrong. Think like a first principles thinker who uses logic & logic only. Disregard feelings.”

Using AI-tools for research integrity

- 1 Tool to detect AI-generated **text**
- 2 Tool to detect irrelevant **references**
- 3 Tool to detect duplicated **images**



Why do publishers
develop these
tools?

Are they trying
to make your
life **difficult**?

No, they are meant
to **protect** you

Who has heard of
paper mills?





Paper mills often sell authorships on nonsense papers to researchers.

“Paper mills often sell authorships on nonsense papers to researchers.”

HIGH-PROFILE EFFORT WILL TACKLE PAPER MILLS

Fake studies are polluting the literature – a group will study the businesses that produce them.

By Katharine Sanderson

A high-profile group of academic publishers, research organizations and funders has launched an effort to tackle one of the thorniest problems in scientific integrity: paper mills, businesses that churn out fake or poor-quality journal papers and sell authorships. In a statement released on 19 January, the group outlined how it will address the problem through measures such as closely studying paper mills, including their regional and topic specialties, and improving author-verification methods.

“There’ve been too many empty words. This is intended to actually deliver,” says Deborah Kahn, an elected council member of the Committee on Publication Ethics (COPE), a non-profit organization in Eastleigh, UK, and co-chair of the steering group of United2Act, which produced the consensus statement.

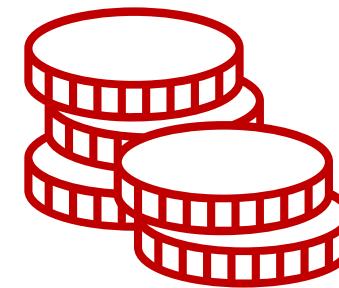
“Paper milling isn’t an operation, it isn’t an organization: it’s a culture,” says data scientist Adam Day, who founded Clear Skies in London, which has developed a detection tool called The Papermill Alarm. Paper mills have been creating a problem for a long time, he says. “And it’s been ignored for a long time.”

Estimates suggest that hundreds of thousands of paper-mill publications are polluting

trying to pad their CVs. One analysis indicates that some 2% of all scientific papers published in 2022 resembled paper-mill productions. Detecting these articles is difficult – although there are growing technological efforts to spot them – and shutting down the operations that produce them is even harder. Researchers are also concerned that the rise of generative artificial intelligence (AI) tools will exacerbate the problem by providing more ways to quickly generate fake papers that can dodge current detection methods.

Five-point plan

United2Act’s statement is the outcome of a summit last May, convened by COPE and the International Association of Scientific, Technical and Medical Publishers (STM), based in Oxford, UK. Researchers, research-integrity analysts, publishers and funders attended the meeting and described five areas that need action, enshrined in the statement. Each point has an associated working group, which will: improve education and awareness of the problem; conduct detailed research into paper mills; improve post-publication corrections; support the development of tools to verify the identities of authors, editors and reviewers; and ensure that the groups across publishing that are tackling the issue communicate.





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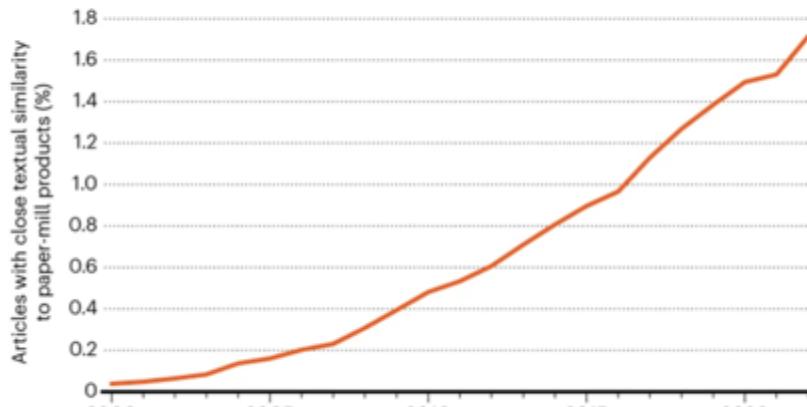
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~1.7% of all articles published in 2022 may be from paper mills!

THE PAPER-MILL PROBLEM

A software analysis finds that articles with close textual similarity to paper-mill products are rising as a proportion of the literature.



©nature

<https://www.nature.com/articles/d41586-023-03464-x>

A woman with long blonde hair, wearing a maroon top, is shown from the chest up. She is looking upwards and to the left with a thoughtful expression, her right hand resting against her chin. The background is a plain, light-colored wall.

Do you think Gen AI makes it
easier for paper mills?

AI intensifies fight against 'paper mills' that churn out fake research

Text- and image-generating tools present a new hurdle for efforts to tackle the growing number of fake papers making their way into the academic literature.

By [Layal Liverpool](#)



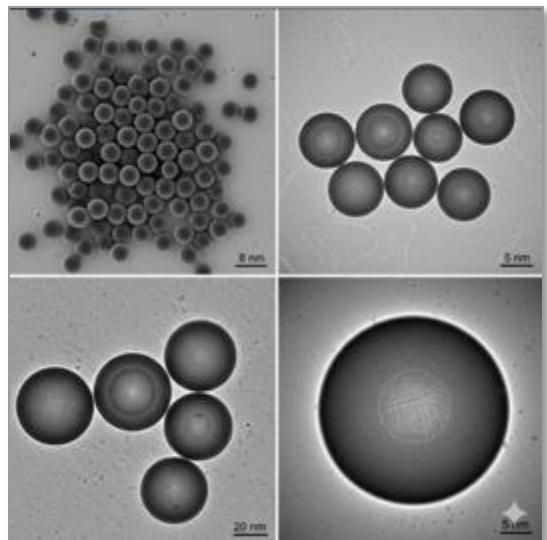
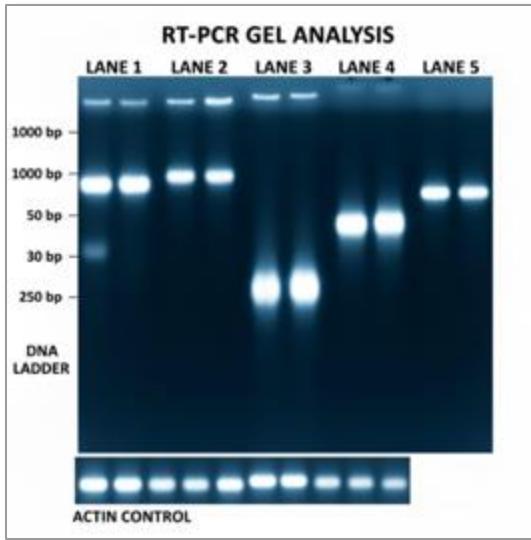
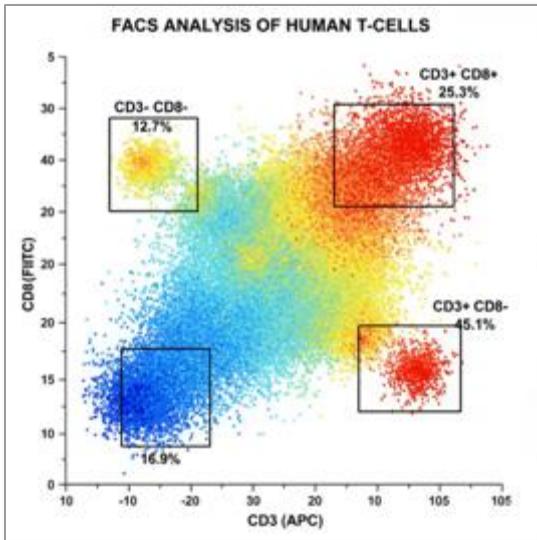
<https://www.nature.com/articles/d41586-023-01780-w>



Artificial-intelligence tools that can generate realistic images and text are making it difficult to detect fake research. Credit: Westend61/Alamy

Easier to generate fake data and write the manuscript!

And this is why publishers are developing tools to detect AI-generated content



Examples of Ai-generated images from Gemini
(courtesy of Xian Jun Loh via LinkedIn)

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We have a free course to help you

SPRINGER NATURE <https://www.springernature.com/gp/editors/research-integrity/avoiding-paper-mills-as-author-course>

Editors Editing a journal Resources and Tools Research Integrity Courses



Avoiding paper mills as an author



Paper mills are currently a pervasive problem in scholarly publishing. These fraudulent organisations attempt to exploit authors' need and desire to publish by selling authorship on fabricated or poor quality manuscripts for a fee. It might be tempting to use a paper mill for the short-term gain, but it is never worth it. This short course for researchers covers what paper mills are and why they are a problem for the scientific literature, why someone might consider using them, the negative consequences of using them, and better alternatives for situations in which research has gone wrong.



Access the course



English



20 minutes



Author Resources

Thank you...any questions?



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