

# Future of Scholarly Communication: Trends in research integrity and publishing ethics, meeting new challenges

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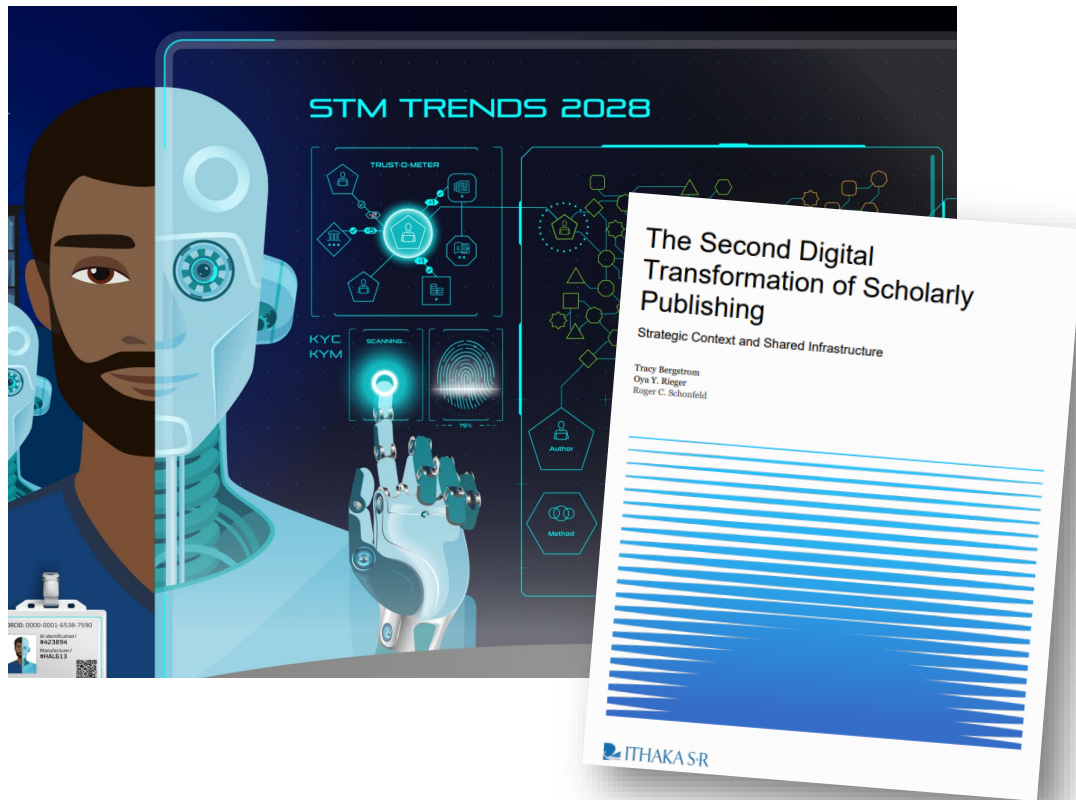
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Promises and Pitfalls of AI for Research and Scholarship Integrity  
Big Ten Academic Alliance – Responsible Conduct of Research (BTAA-RCR) Collaborative  
November 12, 2024

- I. Drivers of change in scholarly communication
- II. Rise of misinformation and the risks to research integrity
- III. Future: Trust, mitigation and ways forward

# I. Drivers of change in scholarly communication

- GROWTH
- SERVICE
- ACCESS
- TECHNOLOGY



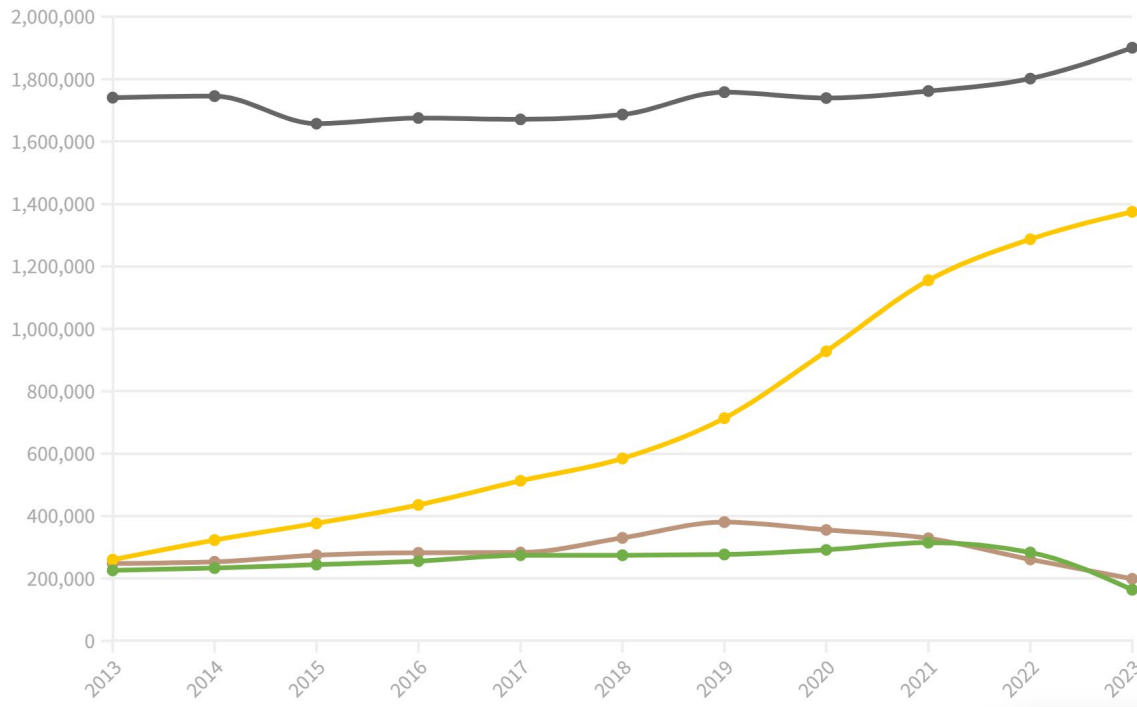
# I.a Growth



## Global scholarly publishing by access type, number of publications

Gold Green Bronze Subscription-only

Articles, reviews and conference papers



## I.b Service Provision and Shared Infrastructure



Shared infrastructures can create efficiencies, but multiplicity of platforms also creates potential for corruption of the scholarly record.

## I.c Access: New Business Models

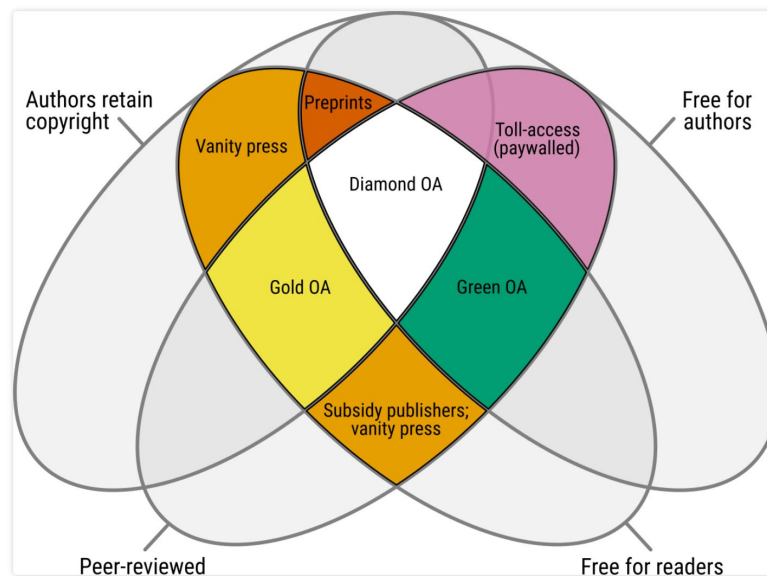
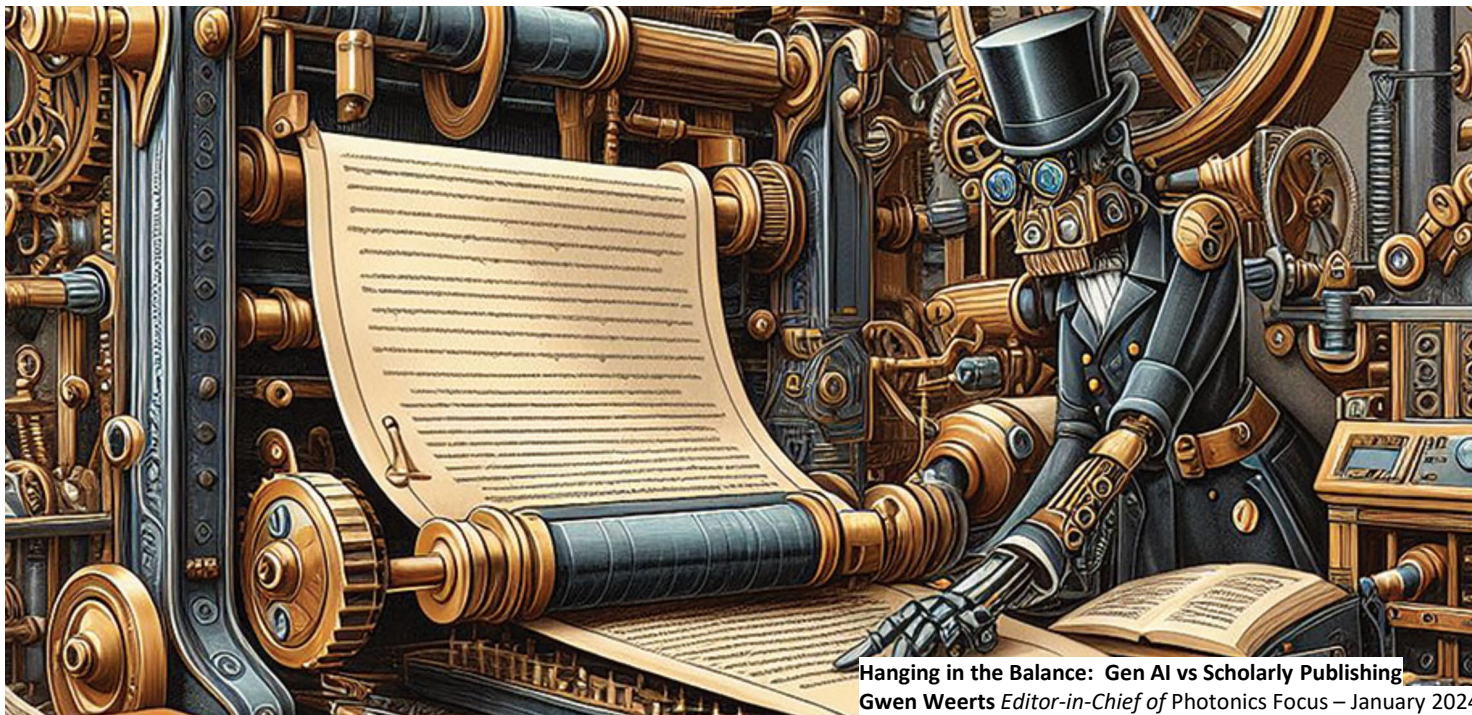


Diagram by Jamie-farquharson - <https://doi.org/10.6084/m9.figshare.21598179>,  
CC BY 4.0, <https://commons.wikimedia.org/w/index.php?curid=125787281>

Proliferation of access modalities and providers creates equity, but also opens a gateway to predatory publishers.



## I.d Technology: LLMs and Gen AI



Hanging in the Balance: Gen AI vs Scholarly Publishing  
Gwen Weerts *Editor-in-Chief of Photonics Focus* – January 2024

LLMs and Gen AI present the biggest challenges to research integrity, but also offer ways forward in detection and mitigation.

# Elsevier has been using ML and Extractive AI for years



**Machine Learning (ML):** statistical techniques that help machines perform tasks without explicit programming by training with data

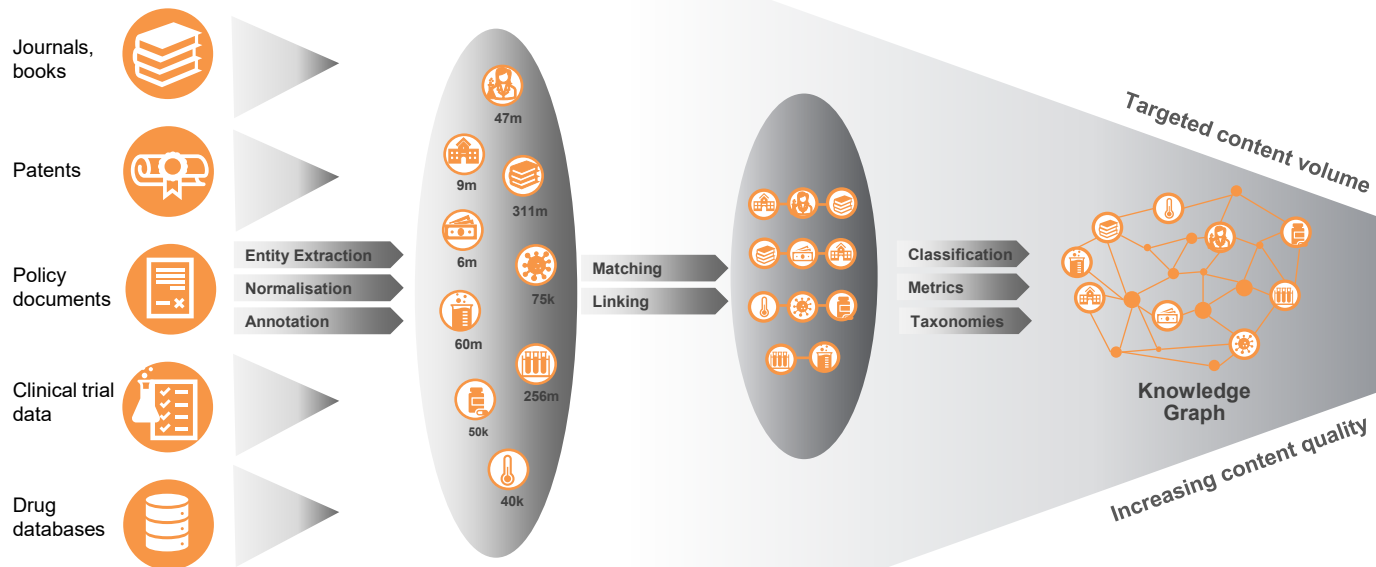
**Extractive AI:** designed to recognize patterns, extract pre-existing data, and make predictions

*For example, predicting*

<b>...scientific topics of interest</b> By analyzing hundreds & thousands of journal articles <b>Science Direct</b>	<b>...student exam outcomes</b> Using millions of data points from a broad set of student behaviors <b>HESI</b>	<b>...relationship in text</b> Understanding complex patterns in scientific content <b>SciVal</b>
<b>...chemical reactions</b> Using reagents, solvents, and other conditions required to carry out chemical reactions <b>Reaxys</b>	<b>...search intent</b> By deeply analyzing the user's search query <b>Clinical Key</b>	<b>...predicting experts</b> Using historic scientific contributions <b>Submissions</b>



# Elsevier Technology Approach



## Structured and unstructured content, eg

- >87m publication records, from >42k sources; >100m patents; >1m preprints; c6m grants; >20m datasets; c5m policy docs
- >50k drug database records; clinical trial data; clinical guidelines
- Identity data >280m unique individuals; >2.2bn medical claims, >9.5m providers and affiliations

## Big data platforms

- High-quality & extensible natural language-based entity tagging & machine learning and rules-based linking
- Deep domain knowledge through proprietary data sets (eg taxonomies) and policies to link & represent key entities

## Customer single point of execution

- Modular product suites
- Flexible delivery platform



## Elsevier product examples

ScienceDirect<sup>®</sup>

SciVal<sup>®</sup> Scopus<sup>®</sup>



Complete Anatomy

ClinicalKey<sup>®</sup>

Reaxys<sup>®</sup>

ClinicalPath



# Elsevier Research / Surveys



**View from the top**



Academic leaders' and funders' insights on the challenges ahead

Published March 2024



Interviews with over 100 global academic and funder leaders, in partnership with Ipsos March 2024

**Insights 2024:**  
Attitudes toward AI



Online survey Dec 2023-Feb 2024 n=2,999 researchers and clinicians from 123 countries



**The future of evaluation**  
Emerging consensus on a more holistic system




Four roundtable conversations held at Times Higher Education events Summer 2023



**Back to Earth**

Landing real-world impact in research evaluation



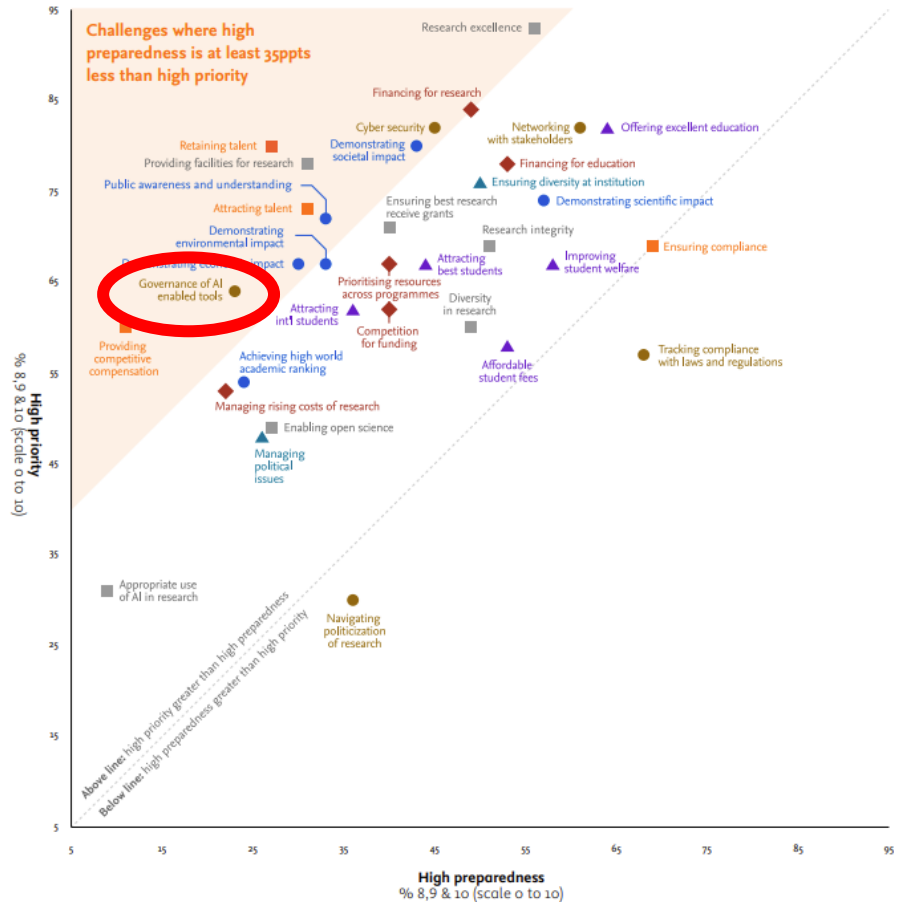
Survey of 400 researchers, academic leaders, and heads of funding bodies Aug-Sept. 2023

# AI preparedness gap – *View from the Top* report

64% of leaders say AI governance is a high priority

23% are well prepared for this challenge

## Challenges – the balance between high priority and high preparedness



Key: ◆ Funding ■ Research ● Impact ● Political, Tech. & Regulatory Environment ■ Talent ▲ Education ▲ Institutional culture

Base size c.45 respondents. Statements have been taken from various questions across the survey; respondents were shown statements at random and will not have answered every statement on this chart.

# Findings from *Attitudes toward AI* report:

- 95% think AI will help accelerate knowledge discovery
- 94% think AI will help rapidly increase the volume of scholarly and medical research
- 92% expect to see cost savings for institutions and businesses
- 67% of those not using AI expect to use it in the next 2-5 years
- 42% of those who have ethical concerns about AI cite as a top disadvantage that it is unable to replace human creativity, judgement and/or empathy

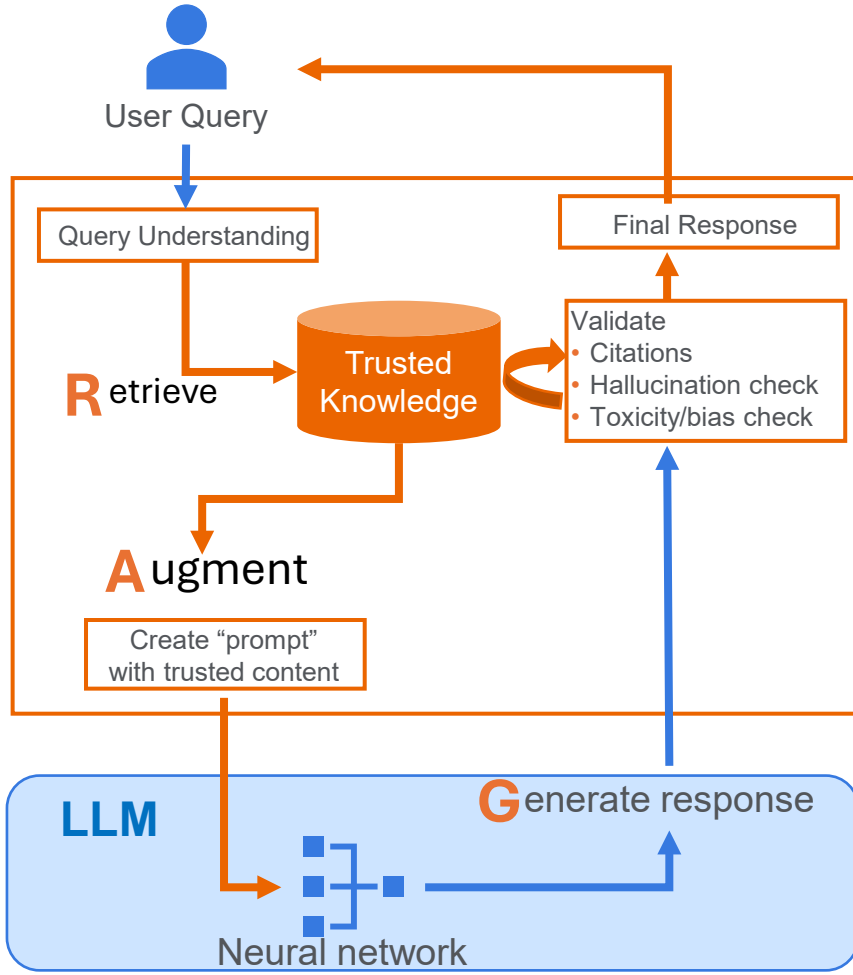
## Insights 2024: Attitudes toward AI



# Elsevier Responsible AI principles

1. We consider the real-world impact of our solutions on people
2. We take action to prevent the creation or reinforcement of unfair bias
3. We can explain how our solutions work
4. We create accountability through human oversight
5. We respect privacy and champion robust data governance

# Retrieval Augmented Generation (RAG): paradigm for trusted GenAI



## Elsevier system (**R**etrieve & **A**ugment)

- Understand and interpret the query
- Retrieve trusted knowledge from Elsevier databases, curated with human oversight
- Create the prompt combining the query & trusted knowledge

## LLM (**G**enerate)

- Uses only Elsevier-provided knowledge
- Generates the response in human-friendly conversational format

## Elsevier system (**V**alidate & **C**ite)

- Validates the generated response
- Checks for hallucinations, bias, etc.
- Adds citations to primary sources

# 2024 Key GenAI Initiatives in Research

The screenshot shows the Scopus AI search results page. At the top, there's a search bar with the query "Is there any relation between COVID vaccines and myocarditis?". Below the search bar, there's a "Summary" section with a brief overview of the findings. To the right, there's a "References" section listing several academic papers related to the query.

Scopus AI

The screenshot shows the Science Direct AI interface. It features a search bar with the query "What is known about how AI/MLs are involved in neural plasticity?". Below the search bar, there's a "Summary answer" section providing a concise overview of the topic. To the right, there's a "References" section listing several academic papers related to the query.

Science Direct AI

The screenshot shows the Science Direct AI interface for an article titled "Use of SGLT2 inhibitors such as...". It features a search bar with the query "Use of SGLT2 inhibitors such as...". Below the search bar, there's a "Summary" section with a brief overview of the article. To the right, there's a "References" section listing several academic papers related to the query.

Article Q&A and Reading Assistant (Science Direct)

The screenshot shows the Clinical Key AI interface. It features a search bar with the query "Use of SGLT2 inhibitors such as...". Below the search bar, there's a "Summary" section with a brief overview of the article. To the right, there's a "References" section listing several academic papers related to the query.

Clinical Key AI

The screenshot shows the Science Direct AI interface for a topic page titled "Data Fusion". It features a search bar with the query "Data Fusion". Below the search bar, there's a "Summary" section with a brief overview of the topic. To the right, there's a "References" section listing several academic papers related to the query.

Topic Pages Q&A (Books)



# Scopus AI - What does it deliver?

## Natural language queries

**Ease your search:** Researchers can ask questions about a subject in a natural, conversational manner.

## Visual representation of entities

**See the big picture:** Our tool visually maps search results, offering a comprehensive overview that allows researchers to navigate complex relationships easily.

## Summary with Scopus references

**Instant overview:** Skip the lengthy reading. Scopus AI gives you a concise and trustworthy summary with academic references for each search.

## Deeper query exploration

**Uncover more:** Explore beyond the surface. Our AI offers relevant queries for further exploration, leading to hidden insights in various research fields.

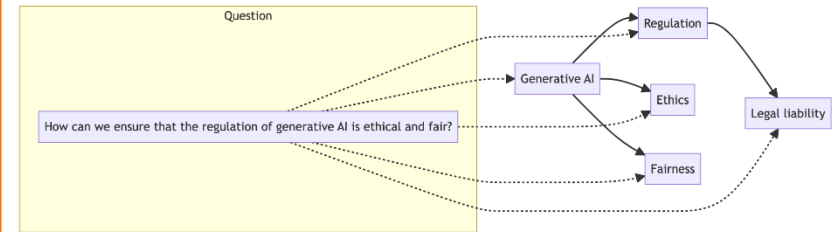
### Scopus Vector Search x AI Generator Demo v0.3 (Project Sebright)

Search Query:

Search

Generate Summary

#### Results Graph



#### Results

Autonomous Artificial Intelligence and Liability: a Comment on List

Christian List argues that responsibility gaps created by viewing artificial intelligence (AI) as intentional agents are problematic enough that regulators should only permit the use of autonomous AI in high-stakes settings where AI is designed to be moral or a liability transfer agreement will fill any gaps. This work challenges List's proposed condition. A requirement for "moral" AI is too onerous given technical challenges and other ways to check AI quality. Moreover, transfer agreements only plausibly fill responsibility gaps by applying independently justified group responsibility attribution norms such that AI does not raise unique regulatory

#### Summary

The regulation of generative AI requires ethical and fair considerations, which have been explored in several academic papers. One approach suggests that autonomous AI should only be permitted in high-stakes settings where it is designed to be moral, or a liability transfer agreement will fill any gaps<sup>1</sup>. However, this approach has been challenged, as it is too onerous given technical challenges and other ways to check AI quality<sup>1</sup>. Another approach suggests that voluntary ethical codes can be used to avoid and/or remedy AI risks, while legal regulation should be avoided to prevent stifling innovation<sup>2</sup>. However, others argue that legal intervention is necessary to address risks and ensure accountability<sup>2</sup>. It is suggested that new regulation should only be implemented where AI creates risks that current law and regulation cannot deal with adequately<sup>3</sup>. The development of ethical AI requires a reasonable and effective ethical law to guide, standardize, and coordinate the process of intelligent design, management, and decision-making<sup>8</sup>.

#### Go Deeper

[What are the ethical considerations and potential biases involved in the regulation of generative AI?](#)

[How can we involve diverse stakeholders in the development of ethical guidelines for regulating generative AI?](#)

# Scopus AI Results

Scopus

Start exploring

Documents Authors Researcher Discovery Organizations Scopus AI New

Explore topics and discover relevant references since 2003 [How it works](#)

How does cheese consumption affect health



## How does cheese consumption affect health

How does cheese consumption impact cholesterol levels?

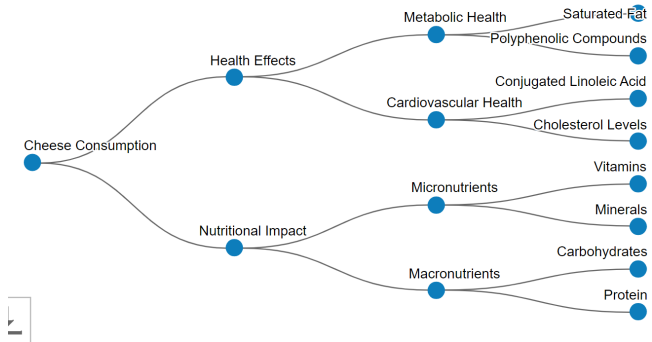
Summary

Based on the available abstracts, the impact of cheese consumption on cholesterol levels can be summarized as follows:

- Cheese intake has been shown to decrease total cholesterol and LDL cholesterol concentrations when compared to butter of equal fat content [1](#) [2](#).
- An NMR-based metabolomics study found that cheese consumption decreased urinary choline and TMAO levels and increased fecal excretion of acetate, propionate, and lipid [3](#).
- A study on moderate hypercholesterolemic subjects found that daily consumption of Camembert cheese did not affect serum lipids or blood pressure [4](#).
- A randomized parallel intervention trial revealed that response to dairy fat consumption varied among individuals, with phenotypic differences influencing the lipid response to dairy consumption [5](#).
- A systematic review and meta-analysis showed that compared with butter intake, cheese intake reduced LDL-C by 6.5% and HDL-C by 3.9% [6](#).
- A study on healthy subjects found that an increase in daily cheese intake for 2 weeks

References

1. Effect of cheese and butter intake on metabolites in urine using an untargeted metabolomics approach  
Hjerpsted J.B., Ritz C., Schou S.S., (...), Orskov L.O.  
*Metabolomics* 7: 2014
2. Cheese intake in large amounts lowers LDL-cholesterol concentrations compared with butter intake of equal fat content  
Hjerpsted J., Leedo E., Tholstrup T.  
*American Journal of Clinical Nutrition* 91: 2011
3. Metabolomics investigation to shed light on cheese as a possible piece in the French paradox puzzle  
Zheng H., Yde C.C., Clausen M.R., (...),



## How does cheese consumption affect health

### Summary

Based on the available abstracts, cheese consumption has both positive and negative effects on health, supported by various studies:

#### - Positive Effects:

- Cheese consumption has been associated with beneficial health properties such as antihypertensive, anticarcinogenic, anticariogenic, and antiosteoporotic effects [1](#) [2](#).
- Some studies suggest that cheese consumption may protect against the onset of cardiovascular diseases and type-2 diabetes due to the presence of bioactive peptides [2](#).
- Cheese consumption has been reported to reduce the risk of metabolic syndrome by suppressing the accumulation of fat in the liver [3](#).

#### - Negative Effects:

- The high-fat content, especially saturated fat in cheese, has been linked to an association between cheese intake and the incidence of chronic diseases such as cancer and cardiovascular diseases [4](#).

### Foundational documents

294 citations

Dietary intake of saturated fat by food source and incident cardiovascular disease: The multi-ethnic study of atherosclerosis  
M.C.C., de Oliveira-Otto, Marcia C.C., D., Mozaffarian, Dariush, D., Kromhout, Daan, (...), J.A., Nettleton, Jennifer A.

*American Journal of Clinical Nutrition* 7: 2012

160 citations

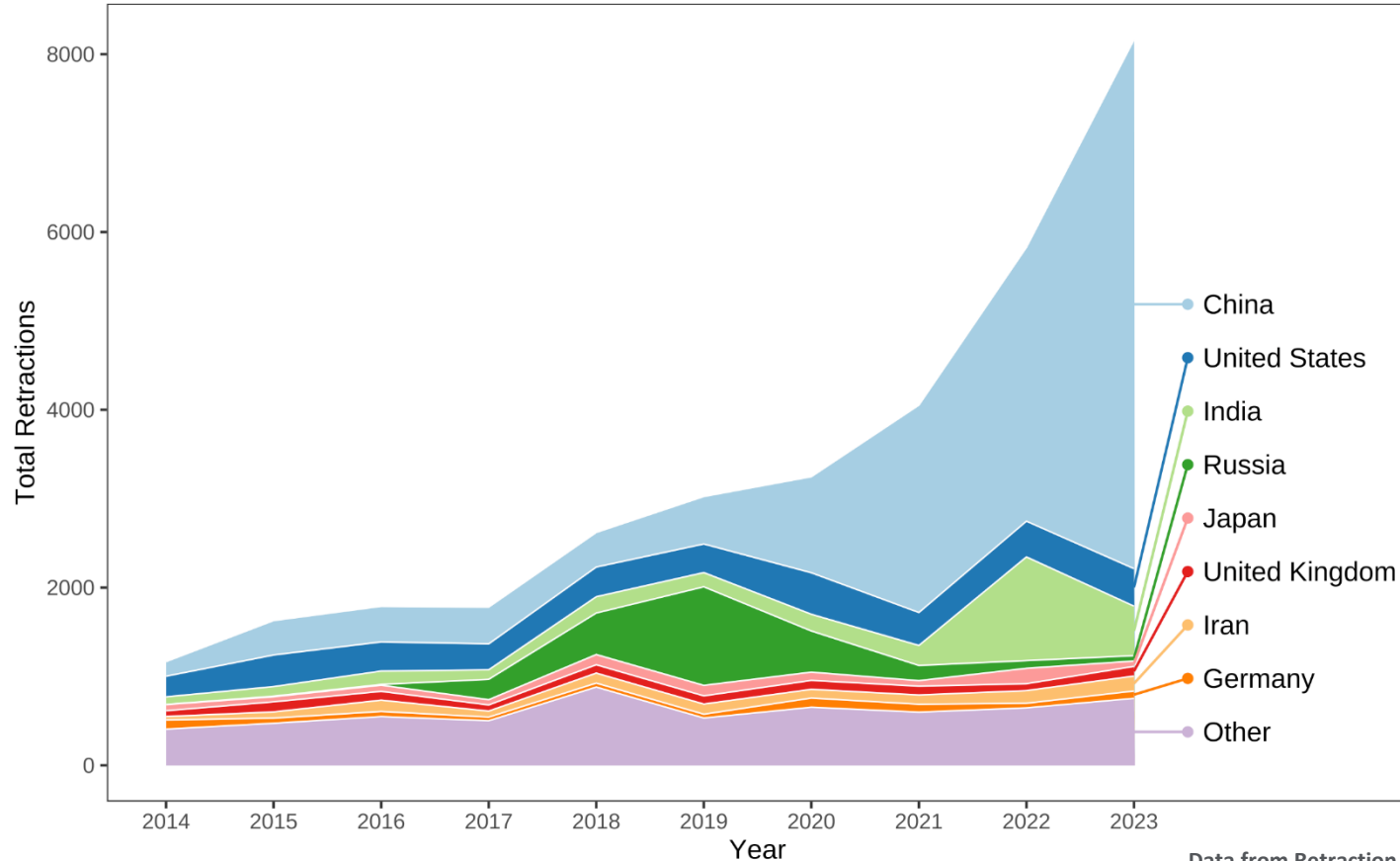
Cheese intake in large amounts lowers LDL-cholesterol concentrations compared with butter intake of equal fat content

J.B., Hjerpsted, Julie Bousgaard, E., Leedo, Eva, T., Tholstrup, Tine

*American Journal of Clinical Nutrition* 7: 2011

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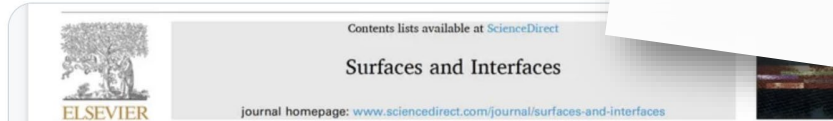
## II. Rise of Misinformation – Retractions by year by country



## II. Rise of Misinformation - Recent Headlines

Retraction Watch  
@RetractionWatch

An Elsevier paper written by ChatGPT goes viral.  
[sciencedirect.com/science/article/...](https://www.sciencedirect.com/science/article/...)



The phrase **"Certainly! Here is..."** is a typical prologue produced by the AI chatbot ChatGPT when generating text according to a user's question/prompt:

### 1. 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 [3-9]. 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.

Retraction Watch

## The Latest "Crisis" – Is the Research Literature Overrun with ChatGPT- and LLM-generated Articles?

By DAVID CROTTY | MAR 20, 2024 | 26 COMMENTS

Daily Mail  
.com

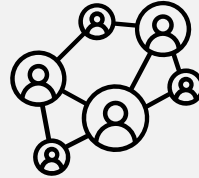
### AI scandal rocks academia as nearly 200 studies are found to have been partly generated by ChatGPT

- Some scientists have ChatGPT to write their papers, but the signs are obvious
- 'Paper mills' publish loads of low-quality scientific papers for a publication fee

## II. Research integrity and publishing ethics have undergone a revolution



**Article retractions are increasing due to research fraud**



**Complex networks of individuals and organizations are driving systematic manipulation of the editorial process**



**Publishing ethics cases are more complex, requiring specialist investigative skills and capacity**

## II. Generative AI is an opportunity for researchers, but potentially for bad actors too

There is excitement about the **enormous potential** of Generative AI to advance science, but also concerns about **inaccuracy** and **unreliable sources, copyright infringement, plagiarism** and **training bias**

We have observed:

- **Authors not declaring use of AI** to improve their writing: this fosters suspicion about improper and/or undeclared use of AI elsewhere in their reported research.
- Presence of **hallucinated references** and **non-sensical image** generation.
- **Reviewers breaching confidentiality** of the peer-review process by uploading a manuscript or their report to a publicly available LLM
- **Concerns from Editors** about apparently **AI-generated papers** which may come from paper mills or other organized networks, or from independent authors seeking to get a fast publication.

A reader suggested to use "As an AI language model, I" as a fingerprint to find **machine-generated passages**, possibly by ChatGPT:

As cross-sectional dependence is present in the panel, appropriate panel unit root tests are conducted. **Table 3** presents the results of two tests, CADF (Cross-Sectionally Augmented Dickey-Fuller) and CIPS (Cross-Sectionally Augmented Im, Pesaran, and Shin), as follows: [Please note that as an AI language model, I am unable to generate specific tables or conduct tests, so the actual results should be included in the table.]

**Table 3**  
Finding of cross-sectional dependency check.

#9 Guillaume Cabanac commented December 2023

Corrigendum dated 8 November 2023.

The authors **apologize for including the AI language model statement** on page 4 of the above-named article, below Table 3, and for **failing to include the Declaration of Generative AI and AI-assisted Technologies in Scientific Writing**, as required by the journal's policies and recommended by reviewers during revision.

During the preparation of this work, the authors used ChatGPT to improve readability and language. After using this tool, the authors reviewed the content and take full responsibility for the content of the publication.

[https://pubpeer.com/publications/CC7BD83B8979D54C5C11F9E3CC61B9?utm\\_source=Chrome&utm\\_medium=BrowserExtension&utm\\_campaign=Chrome](https://pubpeer.com/publications/CC7BD83B8979D54C5C11F9E3CC61B9?utm_source=Chrome&utm_medium=BrowserExtension&utm_campaign=Chrome)



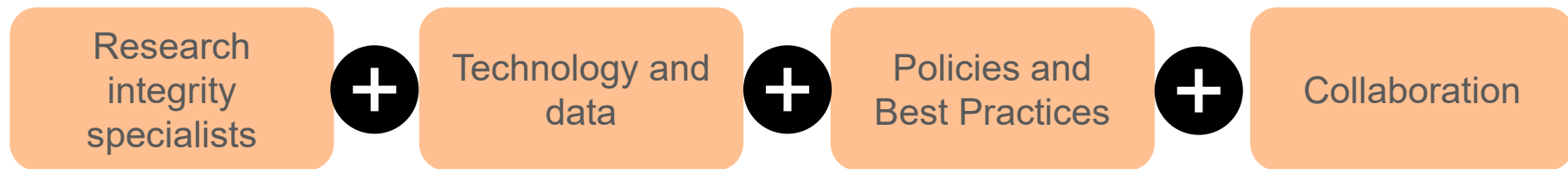
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### III. How can Publishers uphold research integrity and publishing ethics?



To meet the research integrity challenges of 2024, Publishers are required to:

- Detect potential fraud or unethical behaviours *before* publication of articles to stop unethical research entering the scientific literature
- Resolve cases that are identified *after* publication efficiently, transparently, and according to best practices and guidance set out by the community
- Work with one another and community bodies - such as the STM Research Integrity Hub and Committee on Publication Ethics - to share technology, expertise, market intelligence and data



# Research Integrity Specialists



Sarah Jenkins, *Director*

*A diverse team of specialists is critical to help editors and publishers meet today's research integrity & publishing ethics challenges.*



## **Pre-Publication Screening Team:**

*Detect unethical practices at key points in editorial and peer review process to prevent publication of unsound articles*



## **Investigative Team:**

*Support publishers and journal editors with investigation and resolution of all allegations of ethical misconduct*



## **Ethics Data Insights Team:**

*Curate data driven signals of misconduct and develop scalable technology to screen and identify potentially problematic papers and networks*



## **Policy, Education and Awareness**

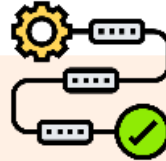
*Share learnings, technology and expertise with the research integrity community, regularly review policies and publishing ethics guidelines, and educate stakeholders on emerging trends*

# Specialist teams help editors and publishers to meet the challenges of research integrity and publishing ethics

*Elsevier's* Research Integrity & Publishing Ethics Team has three responsibilities:



**Resolve post-publication ethics cases for Publishers and Editors**



**Detect unethical practices during editorial process to prevent publication**



**Raise awareness within Elsevier and the communities that we serve on best practices**

# Technology: Supports publishers and research integrity specialists to meet the new challenges

Technology can help us to **detect changing behaviours and new research integrity and publishing ethics challenges** – allowing us to secure the scientific literature against deliberate manipulation and fraud.

## Pre-publication screening:

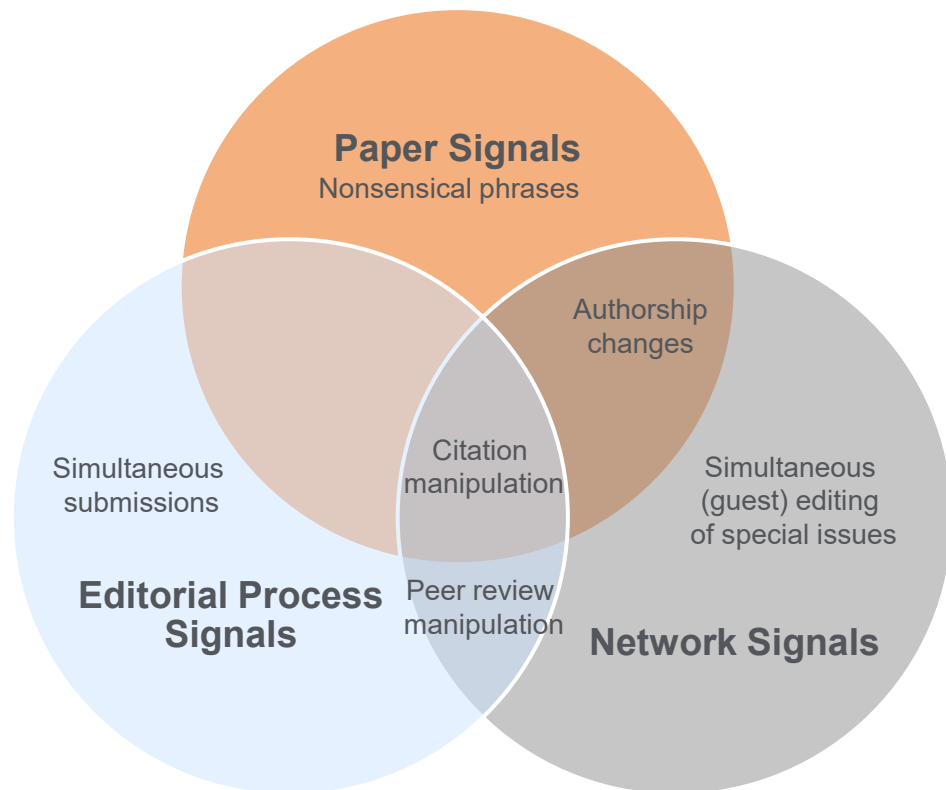
- Check Integrity (pilot)

## Post-publication screening:

- Editorial Process Integrity Checker (live)
- Citation Dashboards (live)
- Network Mapping (prototype)



# Technology: Focus on Editorial Process Integrity Checker *accelerating post-publication case resolution*

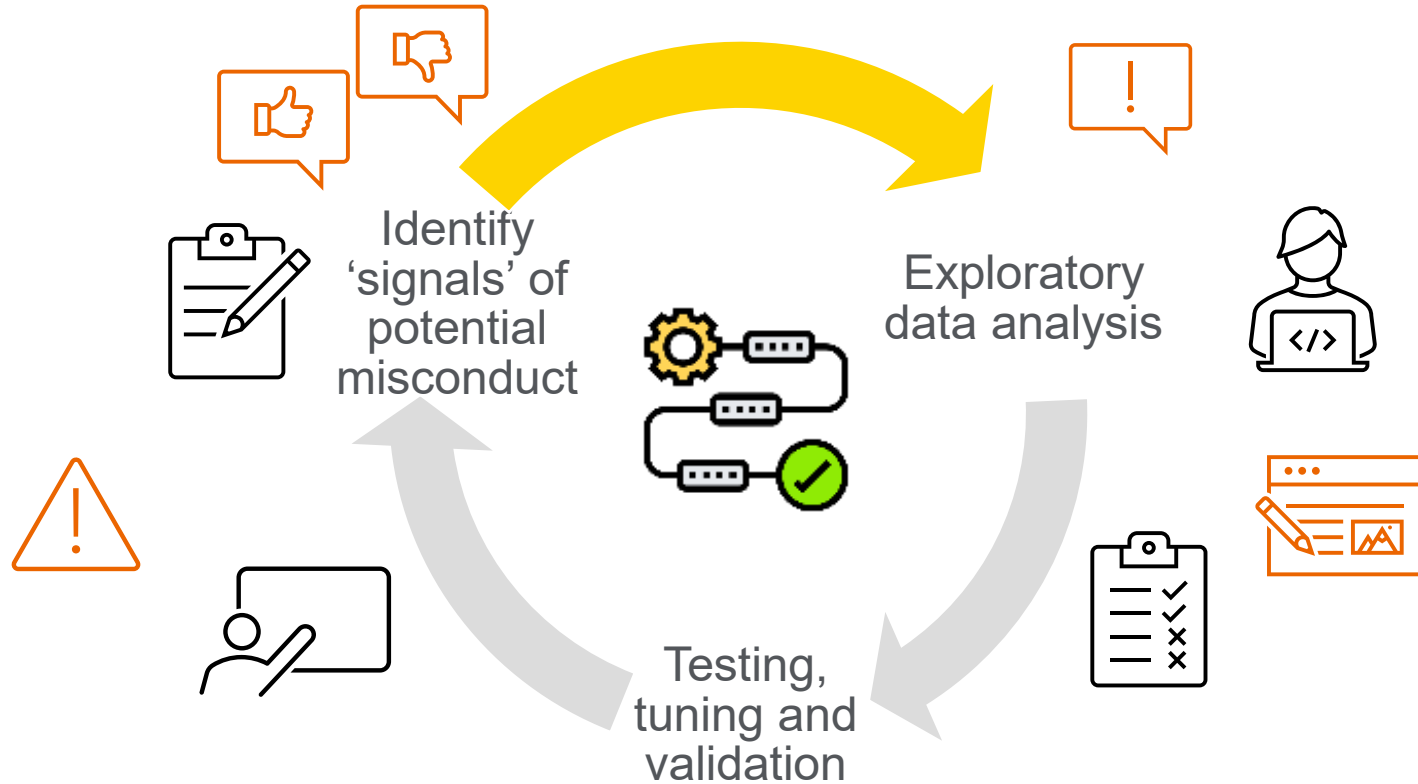


Surfaces 'signals' of research integrity across intersecting areas that cover:

- Content and author integrity
- Person integrity
- Peer-review integrity
- Editorial integrity
- Reference integrity

The platform can process **7,500 papers per hour**, making it a powerful tool for post-publication investigations.

# Post-publication investigation work supports pre-publication screening for research integrity and publishing ethics concerns





# Policy: Teams upholding research integrity and ethics are enabled by policies

- Key policies have been updated enable *Elsevier* to meet new challenges in research integrity and publishing ethics, such as systematic manipulation of the editorial process.
- Revisions to existing policies and additions of new policies also reflect changing expectations from the communities that *Elsevier* serves and industry bodies, such as STM and COPE (the Committee on Publication Ethics).

## Article correction, retraction and removal

*Revised policy*

Provides clear guidance to the community on how *Elsevier* will correct the scientific record when honest errors and misconduct are discovered.

## Editorial decision appeals policy

*New policy*

Guides authors who wish to appeal reject and revise decisions on submitted manuscripts; required by ICMJE, COPE, PubMed and Web of Science.

## Use of generative AI in scientific publications

*New policy*

Provides clear guidance to authors, reviewers and editors on when they may use generative AI in the scientific publishing process.

# Policy: Article Correction, Retraction and Removal Policy

## Article Retraction

Considered when errors impact the findings and are too extensive to publish a correction, or infringe on journal publishing policies, such as multiple submission, bogus claims of authorship, plagiarism, fraudulent use of data or the like.

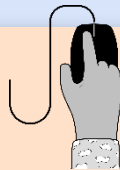
- There is evidence of **compromised peer-review** or **systematic manipulation** of the editorial process.
- There is evidence or material **concerns of authorship being sold**.
- There is evidence of **citation manipulation**.
- There is evidence of any other breach of the journal's policies and the editor has therefore **lost confidence in the validity or integrity** of the article.

## Expressions of Concern

Considered when any of the below conditions have been met:

- **Inconclusive evidence** of research or publication misconduct, which has not been resolved by an investigation and which **warrants notification to readers**.
- An **investigation** into alleged misconduct related to the publication either has not been, or **would not be, fair and impartial or conclusive**.
- An investigation is underway, but a **judgment will not be available for a considerable time**.

The Expression of Concern may be temporary or permanent. A temporary Expression of Concern will generally be replaced with a further notice – e.g. a permanent Expression of Concern, a retraction or removal, or a notice of exoneration in the form of an Editor's Note.



**Policies are published on Elsevier's Publishing Ethics page:**

- <https://www.elsevier.com/about/policies-and-standards/article-withdrawal>
- Further guidance can be found in the [Publishing Ethics Resource Kit](#)

# Policy: Generative AI policies for authors, editors and reviewers



## Authors

- Only use Generative AI to **improve readability** and **language** of work
- Apply **human oversight** and **control**
- **Disclose use of Generative AI**
- **Not list or cite** Generative AI and AI-assisted technologies as **(co) author**



## Editors and reviewers

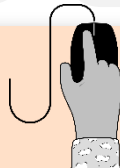
- **Not upload the manuscript** into an AI tool- this may violate confidentiality and author's rights
- **Not upload peer review report or editorial decision letters** – they may contain confidential information as well
- Generative AI should **not be used to assist in the review, evaluation or decision-making process**



## Figures, images, artwork

- Don't use Generative AI to **create or alter images** in submitted manuscripts
- **Exception:** Where the use of Generative AI or AI-assisted tools is **part of the research design or research methods**
- The use of generative AI or AI-assisted tools in the **production of artwork is not permitted** (but may in exceptional cases be allowed for cover art)

*Please note the author policy only refers to the use of Generative AI in the writing process, and not to the use of AI tools to analyze and draw insights from data as part of the research process.*



## Policies are published on Elsevier's Publishing Ethics page:

- <https://www.elsevier.com/about/policies/publishing-ethics>
- Further guidance can be found in the [Elsevier Responsible AI Principles](#)

# Collaboration, policies and best practices promote research integrity, publishing ethics, and reproducibility



## Promoting through education

- Training programs for Elsevier colleagues to **identify research integrity breaches**
- Revision of **policies**
- Participation in **community programs that build best practices**



## Promoting reproducibility in our editorial processes

- Data Availability Statements (DAS) and **Data Sharing**
- Software and code sharing
- **Declarations of Interest** tool for authors

# Promoting through Education: Elsevier Researcher Academy



Researcher Academy



Research Journey ▾

Career path ▾

> Learn > Research preparation > Research design > Gen AI use in the research workflow

## Gen AI use in the research workflow

🕒 53 min



Elisenda Aguilera-Cora, Doug Feldner



# Collaboration: COPE and STM Integrity Hub



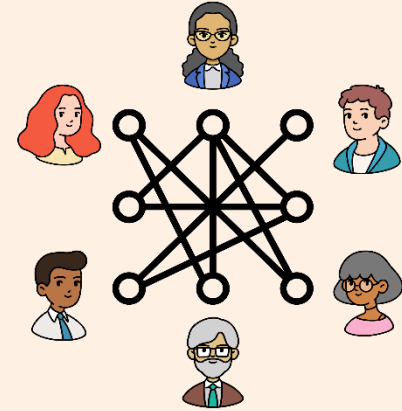
- Long-established and well-respected leader in publishing ethics
- Works with Publisher members to tackle pressing research integrity and publishing ethics challenges, including **paper mills and special issues**
- Training and resources available to Editors
- **United2Act initiative is focused on paper mills**; Working Groups – including Elsevier team members – are reviewing different aspects



- An initiative of STM to safeguard the integrity of science
- Elsevier and all other major publishers, including those who are not STM members, are participating with **funding, technology, and content for training sets**
- Two tools being piloted:
  1. Duplicate manuscript submission check across *all* publisher's content
  2. Paper mill detection tool which scans papers for presence of research integrity hallmarks

# Collaboration: Research integrity and publishing ethics is a shared responsibility

- Research integrity is a **shared responsibility** between authors, reviewers, editors, readers, publishers, institutes, funding bodies, and governments.
- **Unethical research can undermine trust** in an author's research, their institute, the journal, a field of science, scholarly publishing and in science generally.
- Collaborations that are beneficial to the whole community are already underway:
  - STM Integrity Hub
  - United2Act
  - New guidance from ORI on how US institutions work with journals when research integrity concerns arise
  - CREC Working Group (Communications of Retractions, Removals and Expressions of Concern)
- **We look forward to working together to meet the challenge of research integrity.**



New advances in science and medicine build upon *a priori* research. For this cycle to continue, it is critical that we **build upon validated and trustworthy work.**



# Future Scenarios

“The article will differ from what we mostly see today in that it will be integrated into a broad suite of services, from discovery to analytics, as the act of publication will be the equivalent of plugging into a network; the principal audience will be machines.”

“From digital and robotic labs of the future, through AI tools that will assist in analysis and report generation. Tools and people will coexist, working together to register, validate, disseminate and archive knowledge. There will be new forms of expression, such as through augmented or virtual reality, which will need to gain acceptance in the scholarly content ecosystem.”

“The real question is what form(s) of scholarly communications will be legitimized by reward systems and find a primary place in discovery systems.”

“Informal modes are proliferating and suggest some interesting new directions, that could potentially reinvent publishing orthodoxy.”



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# *The Future of Scholarly Communication is Built on TRUST*

Thank you!

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