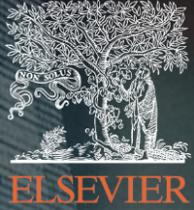




Data and Technology for Good: Elsevier's Developments in AI 資料和技術造福人類: Elsevier 在人工智慧領域的發展

吳萱雯 Vickie Wu
Elsevier 學術與政府資深客戶經理
Nov 15 2023





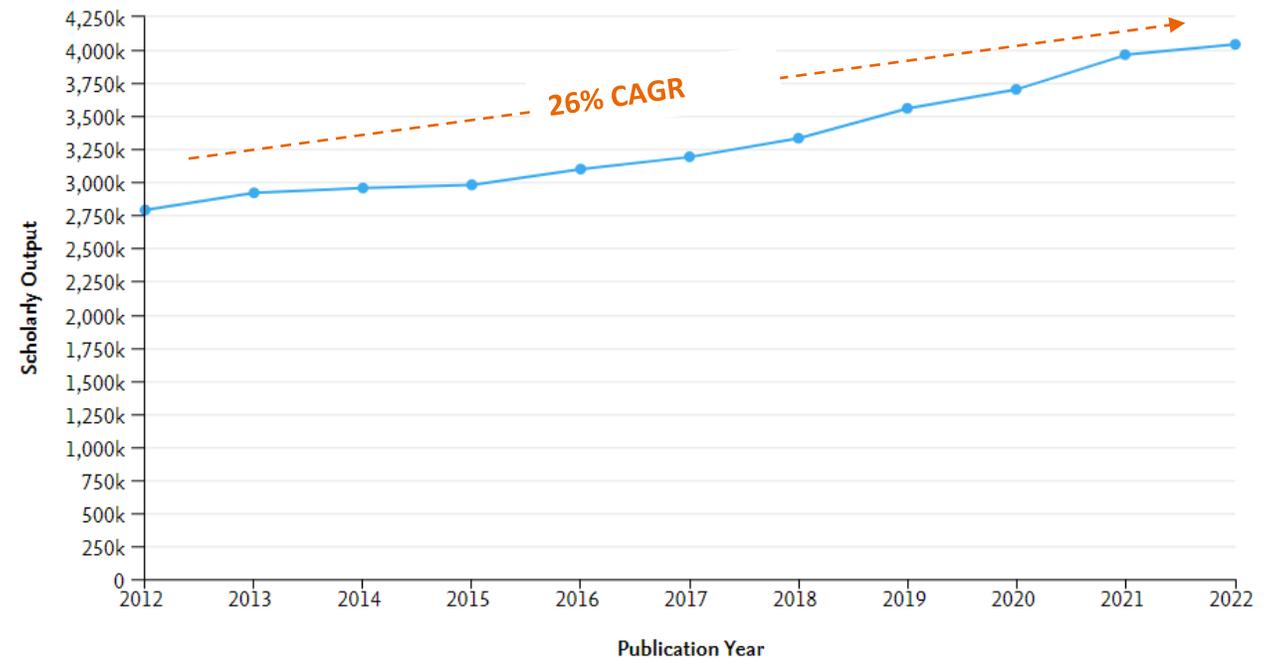
Information overload & authenticity

Scientific information is growing rapidly

Global publication output has grown at the rate of

26% CAGR

Global Publications indexed in Scopus 2012-2022



Source: Publications indexed in Scopus 2012-2022 www.Scival.com

The increase of scientific information from multiple sources poses a significant challenge



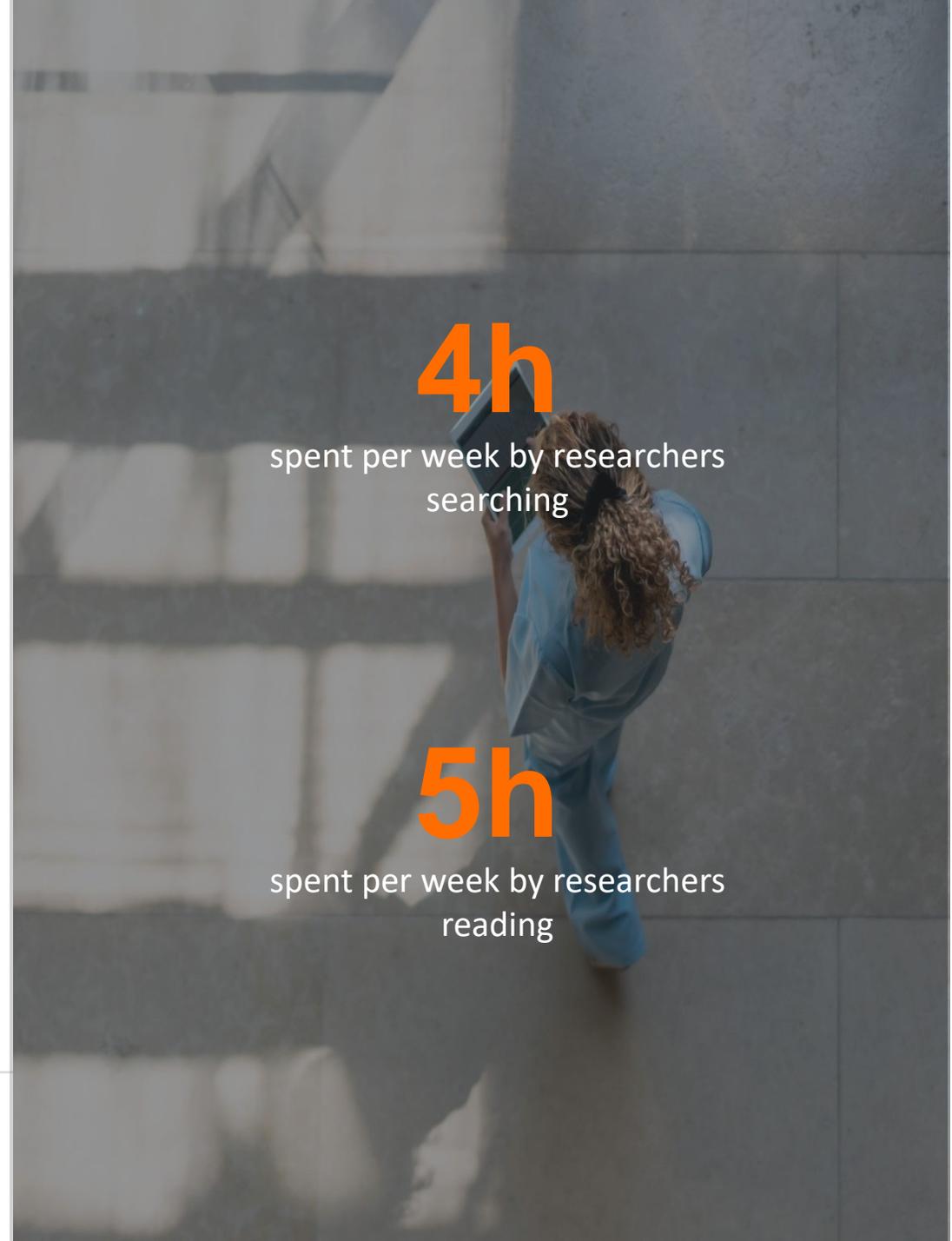
The research community often tells us that they need help with scientific literature reviews.



According to our recent study*, researchers spend significant time searching for relevant content, and only half of the articles read are considered useful.

With article output growing, staying up to date with the latest trusted research is becoming harder.

*Source: [Elsevier Trust in Research report](#)



4h

spent per week by researchers searching

5h

spent per week by researchers reading

In this new era of technology, information will continue to increase much faster



- Overall growth rates of scientific literature are expected to rise by **4.10% annually with a doubling time of 17.3 years**¹



- With the introduction of AI tools, such as ChatGPT, we expect the doubling time to **reduce from 17.3 years to 12.6 years.**



Researchers will be further overwhelmed with the sea of scientific information available

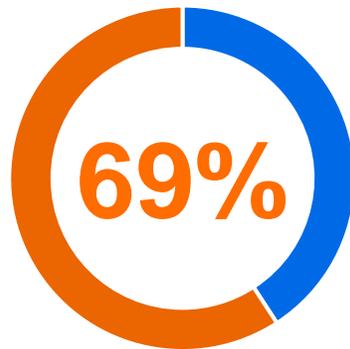
¹[Growth rates of modern science, Nature, 2021](#)

Not only is trusted scientific information increasing, but the amount of misinformation is also increasing and is a major concern for **researchers**

Covid-19 saw widespread misinformation disseminated across traditional media, social media and even in policy circles - Confidence in Research Report, 2022

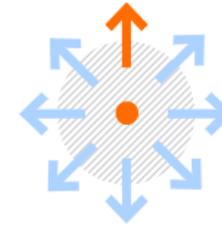


Across the board, the pandemic has spurred concerns around misinformation.

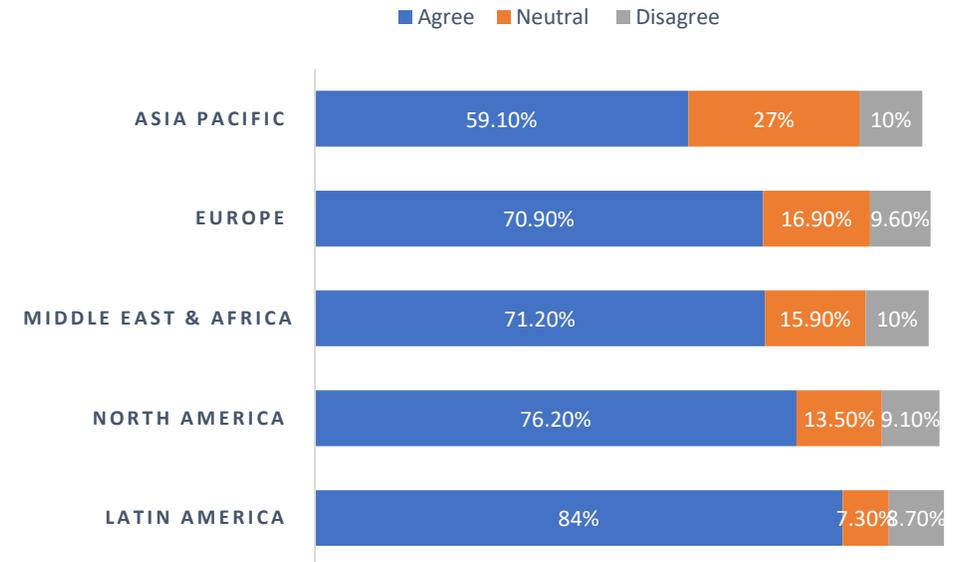


Of researchers surveyed say that the pandemic has increased the importance of separating good quality research from misinformation

[Confidence in Research Report, 2022](#)



The pandemic increased the importance of separating good quality research from misinformation.



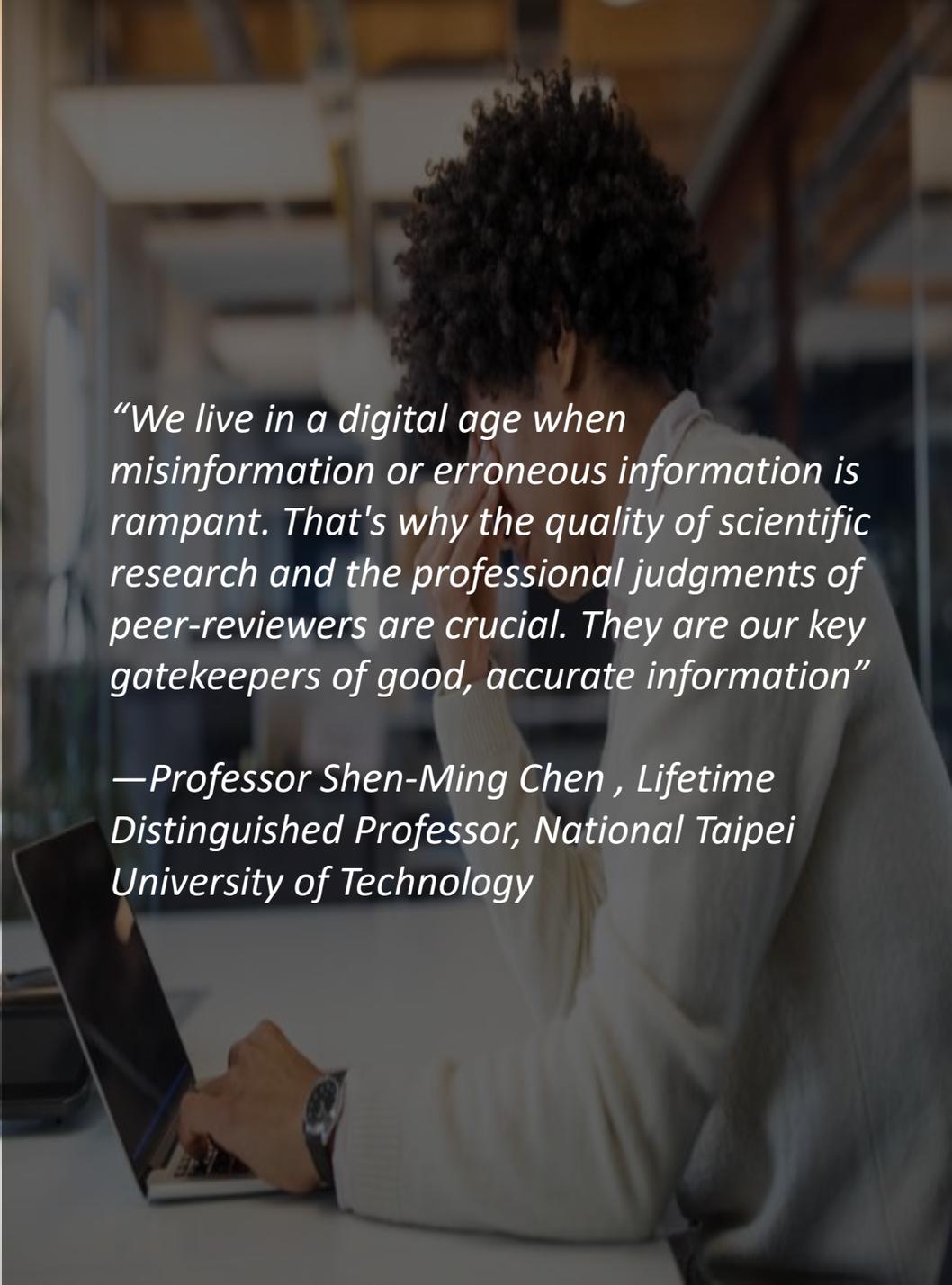
• Sample size (N): North America (N = 849) Latin America (N = 126) Europe (N = 817) Asia Pacific (N = 1163) Middle East and Africa (N = 189)

Information overload is affecting researchers' efficiency

- Researchers are required to constantly filter out information that is either not relevant or authentic.
- This is exceptionally time-consuming and lengthens their research workflow. It impacts the overall quality of education, research output and outcomes for an institution and student experience.

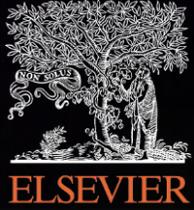
Researchers already overwhelmed by bench and field work, grant-writing, publishing and other responsibilities, trying to navigate the growing deluge of information can be overwhelming.

[*https://www.elsevier.com/connect/trust-in-research](https://www.elsevier.com/connect/trust-in-research)



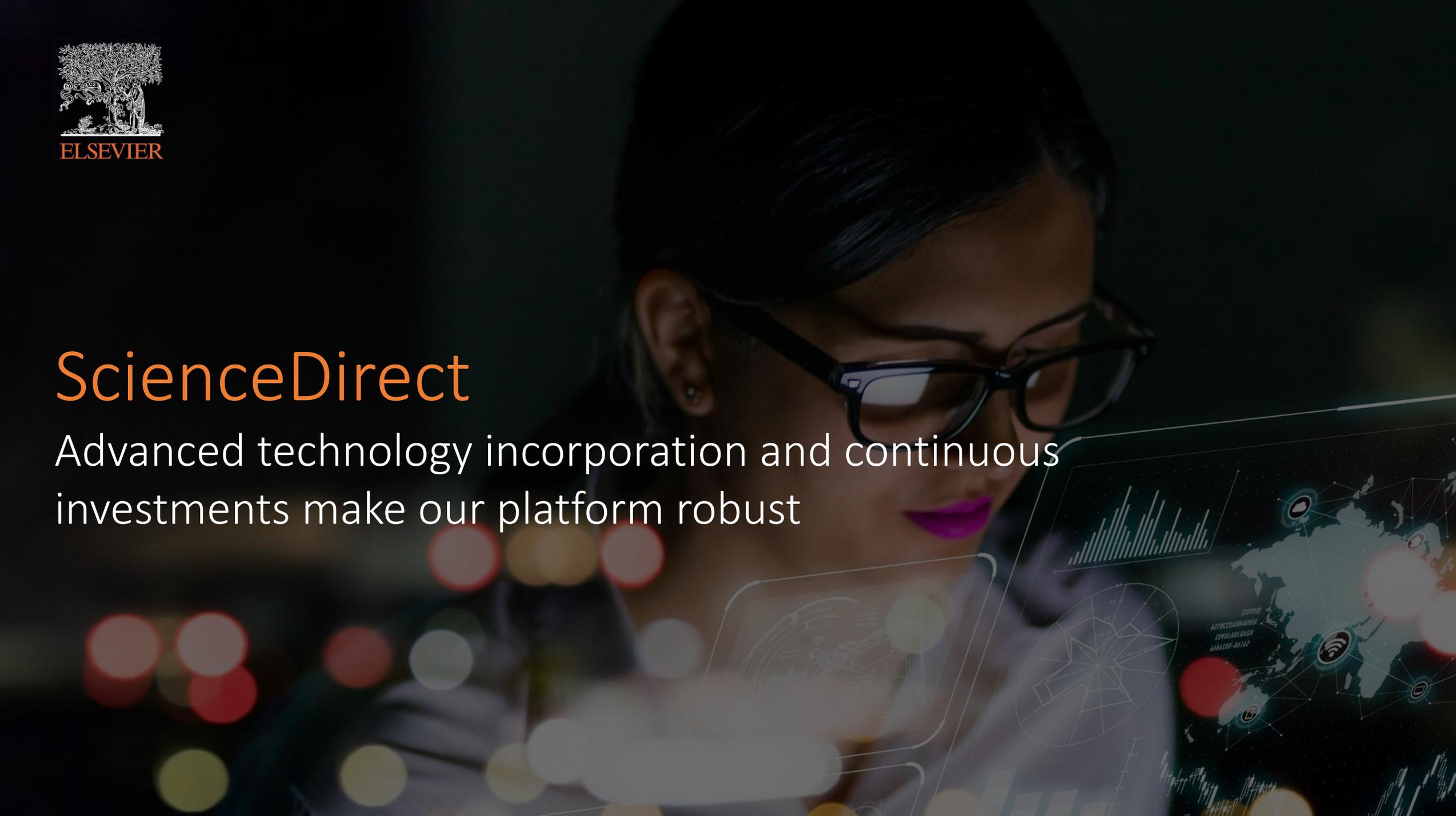
“We live in a digital age when misinformation or erroneous information is rampant. That's why the quality of scientific research and the professional judgments of peer-reviewers are crucial. They are our key gatekeepers of good, accurate information”

—Professor Shen-Ming Chen , Lifetime Distinguished Professor, National Taipei University of Technology



ScienceDirect

Advanced technology incorporation and continuous investments make our platform robust



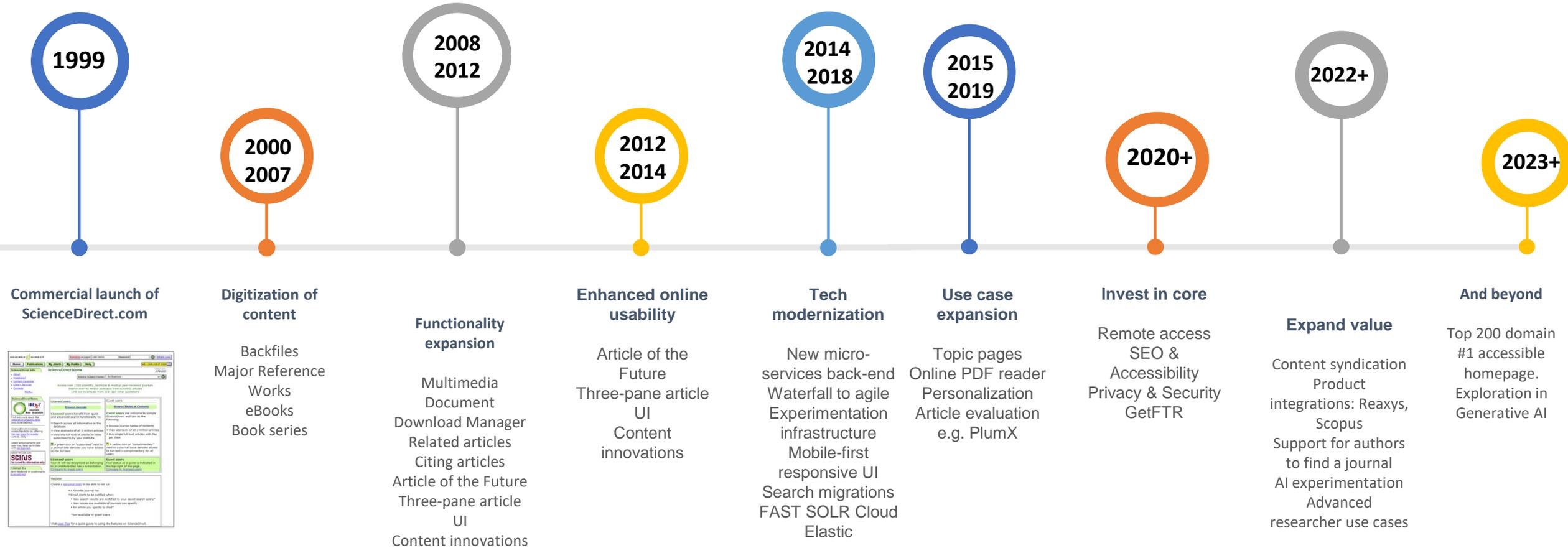
The value we provide to customers at R&L



We continue to enhance customer value by **connecting experiences across the researcher journey**

ScienceDirect was launched as a revolutionary platform and has continued to move from strength to strength

ScienceDirect is a powerful platform that has taken over 20 years to build; it is very hard to replicate



With **ScienceDirect** you can guarantee that

Researchers can get the **most efficient route** to relevant content. *ScienceDirect* provides **unrivalled ease of access** and efficient remote and federated access options.



'Top 200'
platform ranking
on the internet¹



#1 most accessible
platform out of the top
1 Million home pages²



>2 times the
monthly visits of the
next competitor³



88% of researchers
say SD saves me time⁴



ScienceDirect is always available, anywhere at anytime with **99.9% uptime**.

(1) Ahref ranking, (2) [2023 annual WebAIM Top Million study](#) (3) Monthly traffic on SimilarWeb (May 2022) – ScienceDirect with 104m monthly visits, while competitors SpringerNature, Wiley, Taylor & Francis, Frontier and MDPI each received less than 50m monthly visits, (4) ScienceDirect user survey (n=2,071)

AI-Driven Technology



Access ScienceDirect via topic pages, delivering free, critical and contextual information at the time of need

Using **artificial intelligence**, **machine learning algorithms** and **natural language processing tools**, topic pages build a bridge between **book and journal** content to surface comprehensive, interdisciplinary knowledge that answers research questions, deepens users' understanding of a specific topic and fosters getting up to speed

The screenshot shows the ScienceDirect Topics interface. On the left, a grid of subject areas is displayed with article counts:

Agricultural and biological sciences	Biochemistry, genetics and molecular biology	Chemical engineering	Chemistry
30,269	27,269	1,369	18,941
Earth and planetary sciences	Economics, econometrics and finance	Engineering	Food science
			Immunology and microbiology

On the right, a detailed view of 'Topics in Economics, Econometrics and Finance' is shown, including a description: 'ScienceDirect provides coverage of all areas of Economics, Econometrics and Finance including Microeconomics, Macroeconomics, International Economics, Labor Economics and Developmental Economics to help get you up to speed with new and unfamiliar concepts in your area of interest. Browse the Topics list or complete a keyword search to discover more.'

The infographic highlights four key features of ScienceDirect topic pages:

- 375,000 topic pages**
- Covering 20 scientific disciplines**
- Hyperlinked from 10 million journal articles and book chapters**
- Freely available, with 22 million visits per month**

A new age of discovery: Using machine learning to generate topic pages

Taxonomy Building
Over 15 taxonomies in different fields have been used to identify the most important concepts to build topic pages.

Data Mining
We run our taxonomies across all Elsevier's book content and other reference material to identify potential candidates for extraction.

Algorithmic Information Extraction
We then use natural language processing algorithms to ensure the right sections of content are being chosen.

Quality Confirmation
By collecting feedback from subject matter experts and measuring quality, topic pages are continuously improving.

Relevancy Ranking
Heuristic techniques are used to rank definitions and snippets to push the most relevant and diverse information to the top.



Enhancing Fundamental Knowledge

- A central place from which to start the path of discovery and understanding

- **375,000+** pages across **20** subject areas, hyperlinked from **10 million** journal articles
- Over **22 million** visits per month, **2nd** most visited after article pages

Performics

Understand unfamiliar terms and concepts in an article with a single click from AI-generated topic pages



Neuroscience

Volume 172, 13 January 2011, Pages 196–204

Cognitive, Behavioral, and Systems Neuroscience

A sex comparison of the anatomy and function of the main olfactory bulb–medial amygdala projection in mice

N. Kang^a, E.A. McCarthy^a, J.A. Cherry^b, M.J. Baum^a  

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<http://dx.doi.org/10.1016/j.neuroscience.2010.11.003> [Get rights and content](#)

Abstract

We previously reported that some main olfactory bulb (MOB) mitral/tufted (M/T) cells send a direct projection to the “vomeronasal” amygdala in female mice and selectively respond to volatile male mouse urinary odors. We asked whether MOB M/T cells that project to the vomeronasal amygdala exist in male mice and whether there is a sexually dimorphic response of these neurons to volatile male urinary pheromones. Gonadectomized male and female mice received bilateral injections of the retrograde

Amygdala

The amygdala is an almond-shaped structure located within the anterior portion of the temporal lobes, comprising a component of the limbic system and known to play a part in controlling emotion, motivation, and memory.

From: *Social Anxiety (Third Edition)*, 2014

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Learn more about Amygdala

<h4>Amygdala</h4> <p>Deniz M. Yilmazer-Hanke, in <i>The Human Nervous System (Third Edition)</i>, 2012</p> <p>The human amygdala is a high-order limbic brain region almost exclusively of telencephalic origin, which is located in the mesiotemporal region and extends into the basal forebrain. It is a nuclear complex composed of cell groups sharing similarities with neurons in the cerebral cortex, striatum, pallidum, anterior peduncular region, and preoptic area. The deep and superficial cortex-like nuclei containing glutamatergic spiny pyramidal and stellate projection neurons as well as non-pyramidal GABAergic interneurons are the sensory input stations for cortical and subcortical afferents. Both the deep and superficial cortex-like nuclei</p>	<h4>Affective System</h4> <p>Juri D. Kropotov, in <i>Quantitative EEG, Event-Related Potentials and Neurotherapy</i>, 2009</p> <p>D Amygdala</p> <p>Amygdala is a relatively small nucleus that lies deep inside the antero-inferior region of the medial temporal lobe²⁰. Amygdala could be considered as an interface between sensory world²¹ and emotions. Amygdala receives sensory information through the hippocampus from polymodal areas of the temporal and parietal cortex, extracts memories stored in the amygdala, and sends the results of the extraction to the prefrontal cortex through the dorso-medial nucleus of the thalamus.</p> <p>Recordings in the human amygdala show that many neurons in it</p>
---	--



Enhancing Fundamental Knowledge

- Automatically added links in an article take users directly to topic pages
- Giving the contextual information and foundational knowledge of a topic at the time of need

Understand unfamiliar terms and concepts in an article with a single click from AI-generated topic pages (Video/GIF for customer demo)

The screenshot shows a web browser displaying a ScienceDirect article. The article title is "Nicotinamide mononucleotide (NMN) as an anti-aging health product – Promises and safety concerns" from the Journal of Advanced Research, Volume 37, March 2022, Pages 267-278. The authors listed are Harshani Nadeeshani, Jinyao Li, Tianlei Ying, Baohong Zhang, and Jun Lu. The article is marked as open access. A "Highlights" section is visible, containing four bullet points: "Provides an overview of promises and safety concerns of NMN as an anti-aging product.", "Shows that NMN's beneficial effects supported by *in vivo* studies.", "Reveals that there is a lack of NMN's clinical safety and efficacy studies", and "Suggests that proper clinical investigations are urgently needed on the effectiveness and safety of NMN supplementation." The left sidebar contains a navigation menu with options like Outline, Highlights, Abstract, Graphical abstract, Keywords, Introduction, and Cited By (32). The right sidebar shows recommended articles and article metrics, including Citations (27) and Readers (932).



Enhancing Fundamental Knowledge

- Automatically-added links in an article take users directly to topic pages
- Giving the contextual information and foundational knowledge of a topic at the time of need

A new journal recommendation tool to help authors choose journals for their research

Author Challenge: Publishing research can be a very long process, and more often than not, authors choose the wrong journal to submit (based on the rejection rate)

ScienceDirect Journal recommendation tool supports authors in increasing their chances of selecting a more suitable journal by recommendation.



	SD Journals Submit Queen Journal Click	SD Journals Submit Queen Journal Title Click	SD Journals Submit Queen Journal Cover Click
	Recommendation Clicks [e265]	Recommendation Clicks [e265]	Recommendation Clicks [e265]
Segments	13,997	10,733	↓ 3,264
Page: 1 / 1 Rows: 50 1-4 of 4	Jul 19 Aug 23	Jul 19 Aug 23	Jul 19 Aug 23
1. SD Recommendation Position = 1	5,245 37.5%	3,705 34.5%	1,540 47.2%
2. SD Recommendation Position = 2	3,923 28.0%	3,114 29.0%	809 24.8%
3. SD Recommendation Position = 3	2,545 18.2%	2,064 19.2%	481 14.7%
4. SD Recommendation Position = 4	2,284 16.3%	1,850 17.2%	434 13.3%



Improving Author Experience

- Get Journal recommendations from ScienceDirect to publish your research.
- Increasing the chance of articles being accepted at first submission.

Find deeper insights about Journals through the Journals Insight Page



Improving Author Experience

- Find Key metrics and deeper insights about Journals with the new Journals Insights page.
- This feature enables end-users to make informed decisions about the Journal during their article submission process.

The screenshot shows the Chemosphere journal website with a modal window titled 'Insights' open. The modal displays the following information:

- Article Publishing Charge for open access:** \$3610*
- Time to First Decision:** 2.8 weeks
- Publication Time:** 0.7 weeks
- Article Publishing Charge for open access:** \$3610
- Time to First Decision:** 2.8 weeks
- Publication Time:** 0.7 weeks
- View all insights** button

The background of the website shows the journal's header with navigation links (Articles & Issues, About, Publish), a search bar, and a 'Submit your article' button. The main content area includes the latest issue (Volume 321, April 2023) and a section about the journal.

The screenshot shows the Chemosphere journal website with the 'Journal Insights' page open. The page displays the following information:

- Journal Insights:** Aims and scope, Editorial board, **Journal insights** (highlighted), Abstracting & indexing, News, Announcements, Conferences.
- ISSN:** Online ISSN: 1879-1298 | Print ISSN: 0045-6535
- Subject areas:** Environmental Science (General), Environmental Chemistry
- Impact:** CiteScore 11.7, Impact Factor 8.943
- Article publishing charge:** \$3610 (Article publishing charge for open access)
- Publishing timeline:** Time to First Decision 2.8 weeks, Publication Time 0.7 weeks
- Abstracting and indexing:** PubMed/Medline, Environmental Periodicals Bibliography, Analytical Abstracts, Aqualine Abstracts, BIOSIS Citation Index, Elsevier BIOBASE, Cambridge Scientific Abstracts, Current Contents - Agriculture, Biology & Environmental Sciences, Chemical Abstracts, Embase, Pascal Francis, Science Citation Index, Web of Science, Research Alert, Scopus

<https://www.sciencedirect.com/journal/chemosphere/about/insights>

Get quick and authoritative keyword search results within the platform

Conclusions

Columnar neurons from the second optic neuropil are likely the main plastic locus responsible for the modifications in animal behavior when confronted with rapidly repeated object motion. Our results demonstrate that visually guided behaviors can be determined by neural plasticity that occurs surprisingly early in the visual pathway.

[Previous article in issue](#) [Next article in issue](#)

Introduction

Motion vision provides essential cues for a wide variety of animal behaviors. It originated to fulfill two essentially distinct behavioral tasks. One task, which is based on the analysis of panoramic optic flow, is to inform the animal about its own movements. The other task, which is based on the processing of focal motion cues, is to allow the animal to know about the movement of prey, predators, and conspecifics. Because animal navigation imply sustained analysis of the optic flow, the visual processing involved in this task shows little change upon repeated or continuous stimulation. In contrast, behavioral and neuronal responses to repeated object motion often show fast and profound decline. Such decline, in the form of either habituation [1] or more-complex **associative learning** processes [2], represents constitutive mechanisms of an animal's adaptability [2].

The arthropod neural systems that have been investigated extensively and that are used to investigate object or target visual motion are the system that contains figure detection (FD) cells in the blowfly [4]; the system that contains small target

Find articles with these terms

Advanced search

861,636 results

[Set search alert](#)

Refine by:

Years

- 2024 (5)
- 2023 (16,156)
- 2022 (79,329)

Show more

Article type

- Review articles (77,867)
- Research articles (582,340)
- Encyclopedia (12,663)
- Book chapters (66,893)

Show more

Download selected articles [Export](#)

Research article Full text access

1 The relationship between multisensory **associative learning** and multisensory integration
Neuropsychologia, 22 July 2022, ...
Sébastien A. Lauzon, Arin E. Abraham, ... Ryan A. Stevenson
[View PDF](#) [Abstract](#) [Extracts](#) [Figures](#) [Export](#)

Research article Open access

2 Taste-immune **associative learning** amplifies immunopharmacological effects and attenuates disease progression in a rat glioblastoma model
Brain, Behavior, and Immunity, 14 September 2022, ...
Susann Hetze, Lennart Barthel, ... Martin Hadamitzky
[View PDF](#) [Abstract](#) [Graphical Abstract](#) [Extracts](#) [Figures](#) [Export](#)

Get a personalized search experience
Recommendations, reading history, search & journals alerts, and more registration benefits.

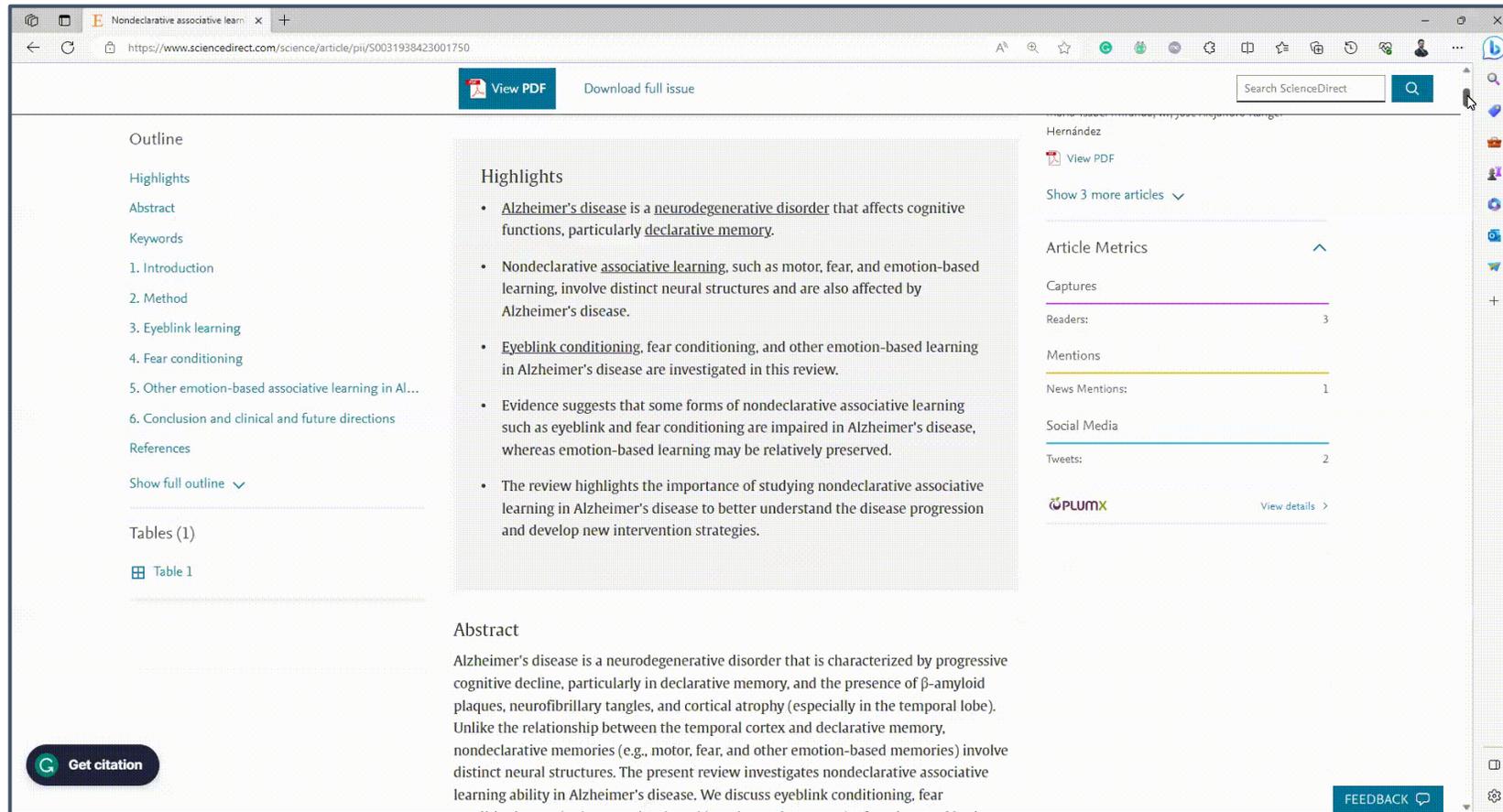
[Personalize](#)



Enhancing Fundamental Knowledge

- Users can select any keyword or text to get quick and authoritative search results
- The user's next move is anticipated and their need to visit other platforms is removed

Get quick and authoritative keyword search results within the platform (Video/ GIF for Customer Demo)



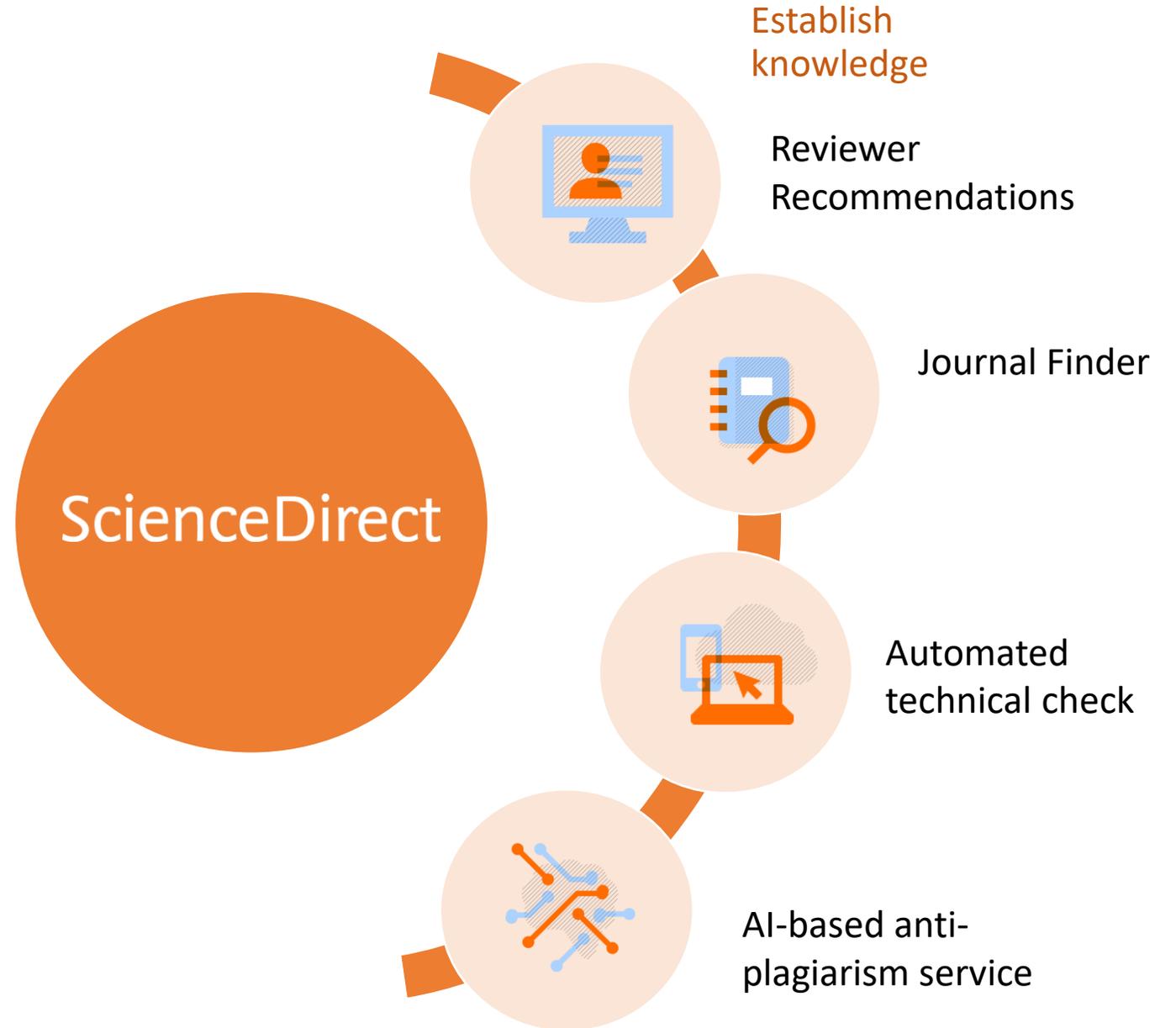
The screenshot shows a web browser displaying a ScienceDirect article. The article title is "Nondeclarative associative learning in Alzheimer's disease". The page includes a navigation menu on the left with sections like Outline, Highlights, Abstract, Keywords, and Introduction. The main content area features a "Highlights" section with several bullet points, followed by an "Abstract" section. On the right side, there is an "Article Metrics" section showing "Readers: 3", "Mentions: 1", and "Tweets: 2". A "Get citation" button is visible in the bottom left corner of the article content area.



Enhancing Fundamental Knowledge

- Users can select any keyword or text to get quick and authoritative search results
- The user's next move is anticipated and their need to visit other platforms is removed

How is Elsevier using AI to assist in the editorial process?



Reviewer Recommendations

Editors are assisted by providing **reviewer recommendations** based on keywords and other metadata. The reviewer data source is from Scopus.

Elsevier EM Training Journal 1 Serena Walker | Logout

Home Main Menu Submit a Manuscript About Help Shortcuts Simple Submission Search

← Reviewer Selection Summary - Submission ELSTRAINING1-D-23-00029

Find Reviewers using Scopus video
Jack Hill

Ways to find reviewers using Scopus

1. Browse through pre-generated **System Recommendations**.
2. Search on self-chosen **keywords** and **authors** on Scopus.
3. Browse matched **Interested Reviewers** and **Editorial Board Members**.
4. See the best matches against your journal database in **Journal Reviewers**.
5. Review the **co-authors** of matching candidates.

Select "**Find reviewers using Scopus**" below.

Please keep diversity of gender, career stage and geography of reviewers in mind.

Search Type

My Publication Suggested by Author Personal Classifications Suggest Reviewers Classification Matches Find reviewers using Scopus

Search From

Entire Database

Criterion Is/Is not Selector Value

Last Name is Begins With

Add Search Option +

Journal Finder

Authors are supported with **finding a suitable journal** to submit to, both pre-submission (Journal Finder) and after desk reject (Transfer Your Manuscript). [Journal Finder](#) is a tool that uses a machine learning algorithm to recommend Elsevier journals that match the scope of author's manuscript.

The screenshot shows the Elsevier Journal Finder website. At the top left is the Elsevier logo and the text "Journal Finder". To the right are navigation links: "Find journals", "About", "Support", "My journals", "Register", and "Sign in". The main heading is "Find the right journal for your research". Below this is a sub-heading: "Looking for the best journal match for your paper? Search the world's leading source of academic journals using your abstract or your keywords and other details." There is a link "> More on how it works". The search area has two radio buttons: "Match my abstract" (selected) and "Search by keywords, aims & scope, journal title, etc...". Below the radio buttons is a text input field with the placeholder "Enter your abstract" and a cursor. To the right of the input field is a blue button labeled "Find journals >". Below the input field is the text "Maximum 5,000 characters". Below the search area is a link "Check if you're eligible for open access (OA) savings.". At the bottom of the page is a banner with a blue icon of three horizontal lines and the text "Boost your publication chances". Below this is the text "Get published faster. Make sure your article is written in correct English before submission. Articles that get language editing are more likely to be published in a peer-reviewed journal."

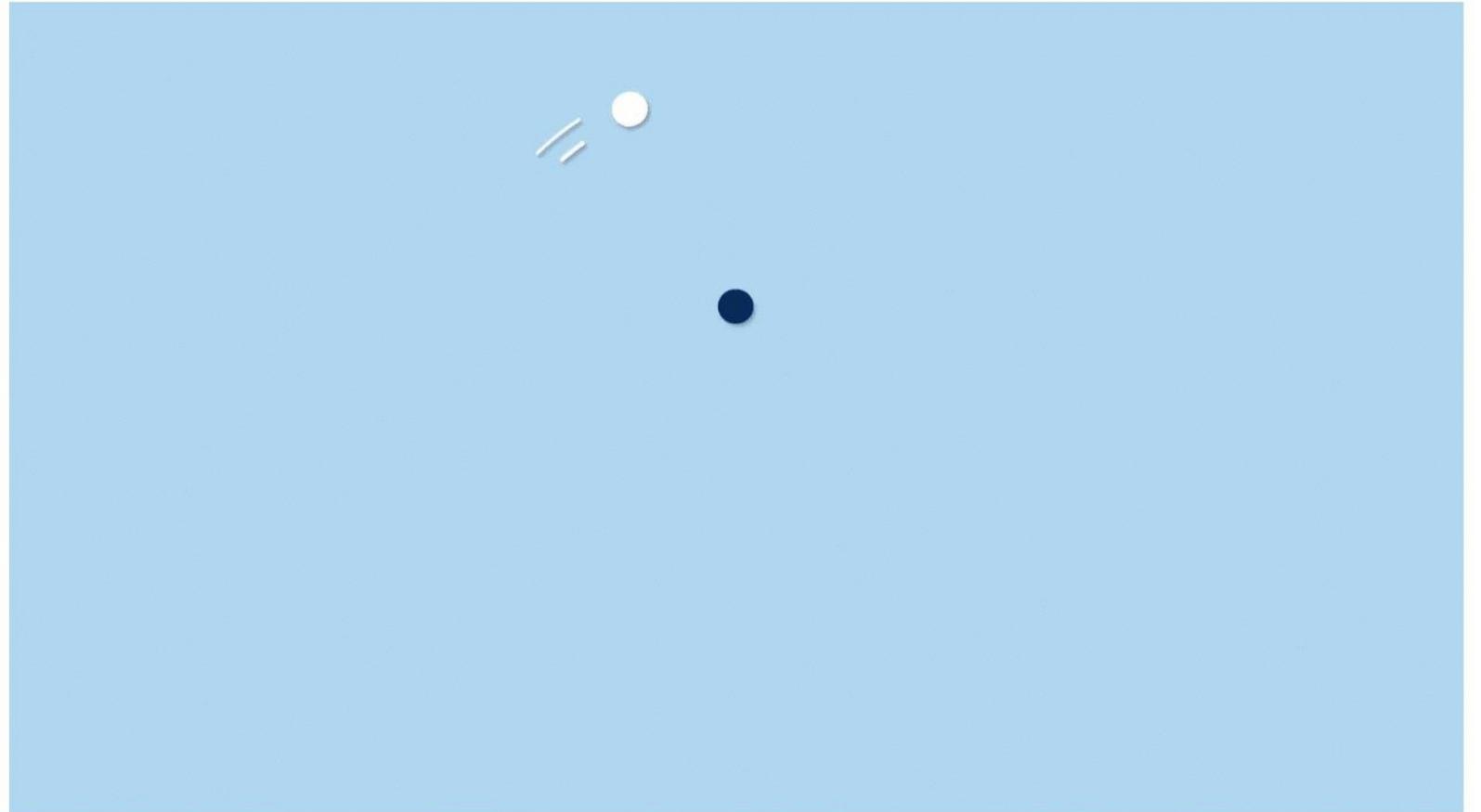
Automated Technical checks

We are developing a service that performs an automated **technical check** on a paper (missing items, usability, etc.) and gives feedback to the author during the editorial process.

Automated technical checks are in development as part of our “New Submission Experience”

AI-based anti-plagiarism service

We are using an **AI-based anti-plagiarism service** which checks the percentage of overlap in a paper and presents the results back to the editor for human evaluation. As we believe that safeguarding research integrity must be done through collaboration with all stakeholders in the scholarly ecosystem, we are part of the cross-publisher [STM Integrity Hub](#) initiative.



Elsevier's policies for authors, editors and reviewers on Generative AI



Responsible use

Elsevier's Generative AI policy for authors emphasizes **responsible use** & the need for **disclosure**



Protecting authors' rights

Our policies for editors and reviewers focus on **protecting** the authors' **confidentiality** and data **privacy rights**



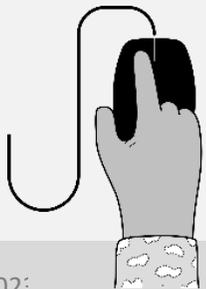
Policies will evolve

Elsevier will **monitor ongoing developments** in this area closely and will **adjust** or **refine** the policies as appropriate



Answering questions

Our policy page features a **FAQ-section** which we will continue to **refresh** as **questions** and **concerns** from the **community** arise



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](#)

May you use AI for other purposes than text?

- For making language corrections? ✓
- For sorting through a dataset for potential interesting results? ✓
- For suggesting new combinations of experiments ✓
- For making illustrations for the publication ✓
- For making the reference list? ✗
- For selecting co-authors? ✗



Thank you!

How is Elsevier using AI to assist in the editorial process?

Elsevier continues to develop and adopt in-house or licensed technologies that support researchers and respect authors', reviewers' and editors' confidentiality and data privacy rights. Our AI-driven technologies are identity-protected and conform to the [Elsevier Responsible AI principles](#).

Examples include:

- Editors are assisted by providing **reviewer recommendations** based on keywords and other metadata
- Authors are supported with **finding a suitable journal** to submit to, both pre-submission (Journal Finder) and after desk reject (Transfer Your Manuscript)
- We are developing a service that performs an **automated technical check** on a paper (missing items, usability, etc.) and gives feedback to the author during the editorial process
- We are using an **AI-based anti-plagiarism service** which checks the percentage of overlap in a paper and presents the results back to the editor for human evaluation. As we believe that safeguarding research integrity must be done through collaboration with all stakeholders in the scholarly ecosystem, we are part of the cross-publisher [STM Integrity Hub](#) initiative.

Where does Elsevier stand, on all this?

Publishing ethics

Duties of the Publisher

Duties of Editors

Duties of Reviewers

Duties of Authors

References

[Elsevier's AI author policy](#) states that *authors* are allowed to use generative AI and AI-assisted technologies in the writing process before submission, but only to improve the language and readability of their paper and with the appropriate disclosure, as per our instructions in Elsevier's Guide for Authors.

This policy has been triggered by the rise of generative AI and AI-assisted technologies and

Generative AI or AI-assisted technologies should not be used by editors to assist in the evaluation or decision-making process of a manuscript as the critical thinking and original assessment needed for this work is outside of the scope of this technology and there is a risk that the technology will generate incorrect, incomplete or biased conclusions about the manuscript.

upload a submitted manuscript or any part of it into a generative AI tool as this may violate

Elsevier owns identity protected AI-assisted technologies which conform to the [RELX Responsible AI Principles](#), such as those used during the screening process to conduct completeness and plagiarism checks and identify suitable reviewers.

including any nomination or decision letters as they may contain confidential information

about the manuscript and/or the authors. For this reason, editors should not upload their letters into an AI tool, even if it is just for the purpose of improving language and readability.

Peer review is at the heart of the scientific ecosystem and Elsevier abides by the highest

<https://beta.elsevier.com/about/policies-and-standards/publishing-ethics?trial=true>

manuscript implies responsibilities that can only be attributed to humans. Generative AI or