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(Més)usages des LLM pour la production scientifique

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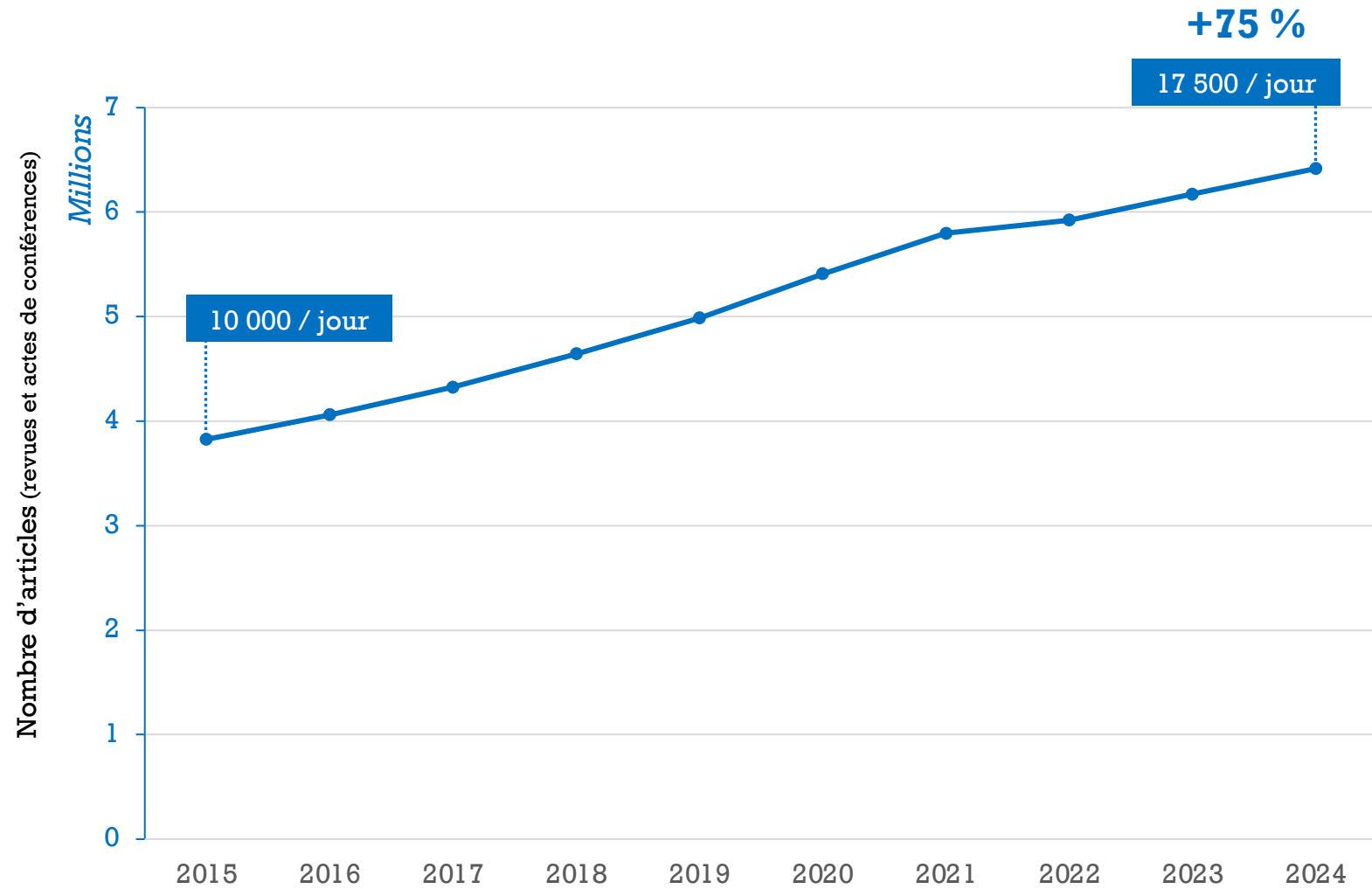
UNIVERSITÉ
DE TOULOUSE

(Més)usages des LLM pour la production scientifique

Ophélie Fraisier-Vannier, IRIT-CNRS, équipe IRIS

Colloque Ofis 15 avril 2025, Paris

Production scientifique en hausse






Production et productivité scientifique en hausse

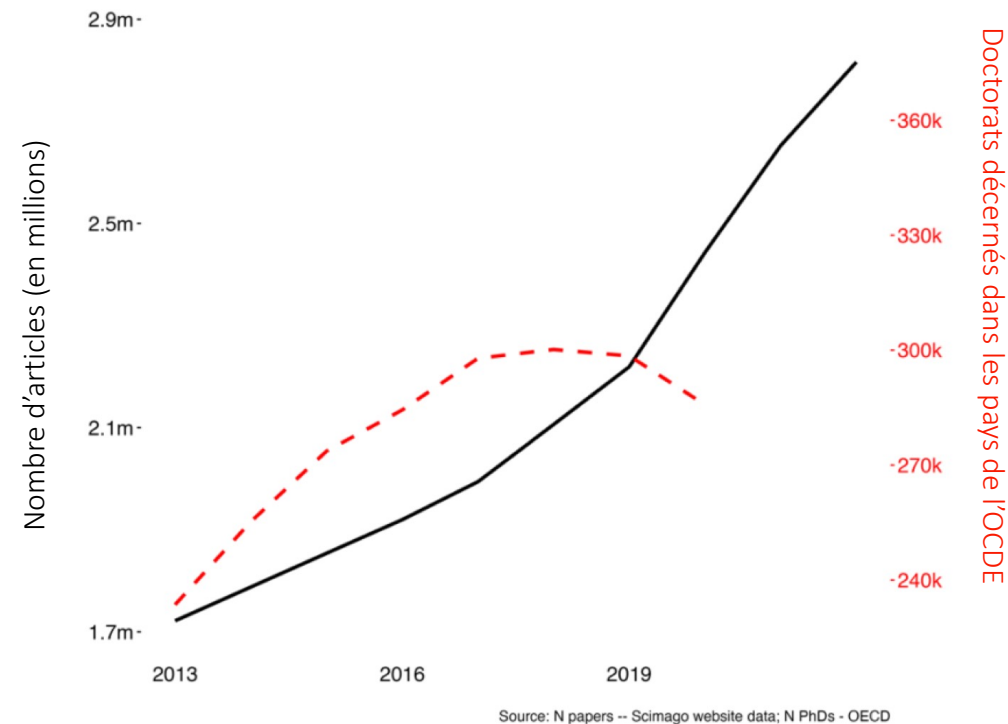
November 08 2024

Quantitative Science Studies 1-21.
https://doi.org/10.1162/qss_a_00327

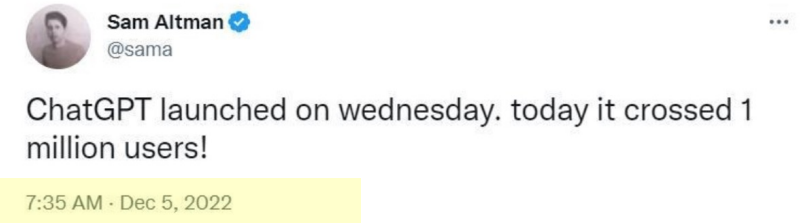
The strain on scientific publishing

Mark A. Hanson  , Pablo Gómez Barreiro , Paolo Crosetto , Dan Brockington 

« L'augmentation de la production d'articles scientifiques n'est possible qu'avec la participation des chercheurs, qui agissent en tant qu'auteurs, évaluateurs et éditeurs. »



2023 : déferlante ChatGPT



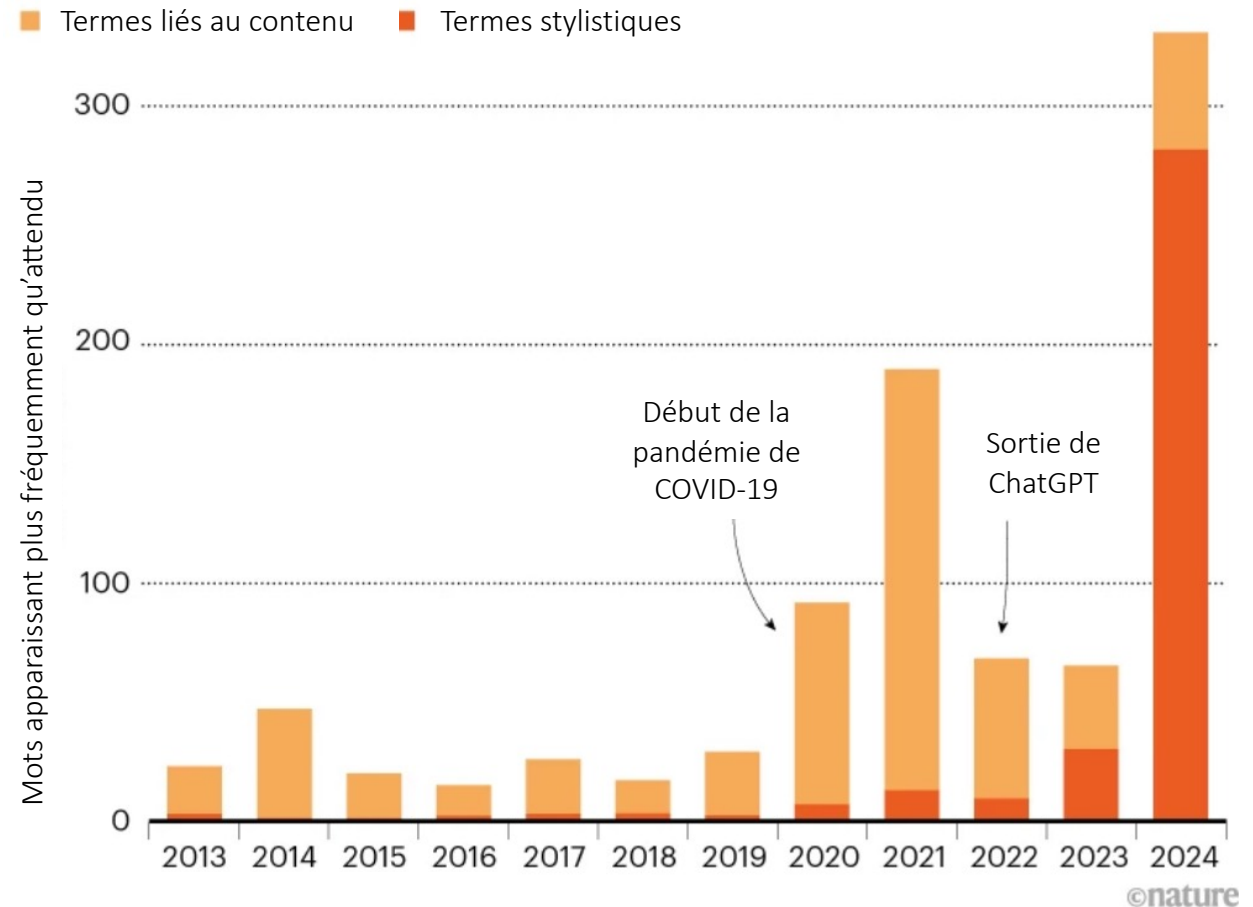
Premiers indices de l'usage de ChatGPT dans les publications scientifiques

5

D'après une analyse de 14 millions de résumés d'articles scientifiques, hausse inhabituelle de **termes stylistiques** après le lancement de ChatGPT

Exemples de termes stylistiques couramment utilisés par ChatGPT:

- 'delves' (approfondi)
- 'showcasing' (présentant)
- 'underscores' (souligne)

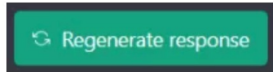


Adapté de <https://doi.org/10.1038/d41586-024-02371-z>

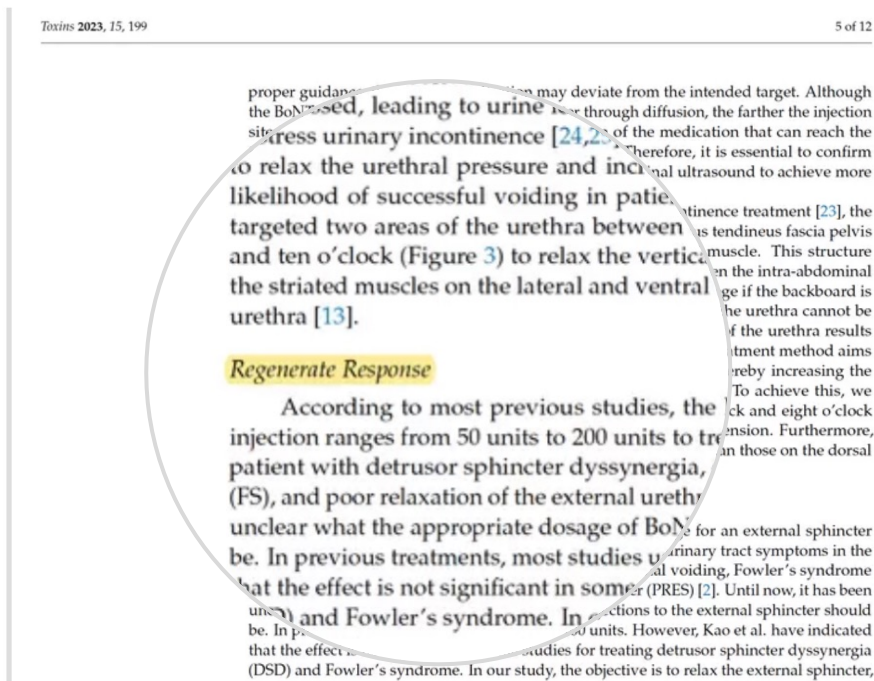
Des preuves irréfutables de l'emploi de LLM

#1 Guillaume Cabanac commented May 2023

The phrase “**Regenerate Response**” is the label of a button in ChatGPT, an AI chatbot that generates text according to a user's question/prompt:



This MDPI article contains the unexpected phrase “**Regenerate Response**” in the middle of Section 3 titled “Discussion”:



<https://pubpeer.com/publications/DF3D58918B5A0BD5943E6D280ED7E2>

#1 Guillaume Cabanac commented August 2023

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.]

<https://pubpeer.com/publications/CC7BD83B8979D54C5C11F9E3CC61B9>

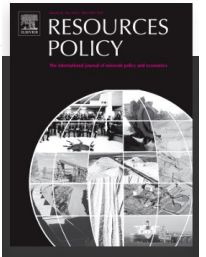
#1 Alex Glynn comment accepted March 2025

On page 25:

Cancer vaccines and chemotherapy are two different approaches to treating cancer, and their effectiveness can vary depending on the type and stage of cancer, as well as individual patient factors. *It is important to note that as an AI language model, I can provide a general perspective, but you should consult with medical professionals for personalized advice.* [my emphasis]

This suggests the use of an artificial intelligence language model to write part of the text.

<https://pubpeer.com/publications/2FF96DD440C928A3DDF99771A48B4A#1>



10.2

Impact Factor

Des preuves irréfutables de l'emploi de LLM

Academ-AI recense des usages non déclarés de ChatGPT dans les publications scientifiques

Fondé par Alex Glynn (Kornhauser Health Sciences Library, University of Louisville, USA)



Maison d'édition	Articles de revues	Article de conférences
IEEE	8	81
Elsevier	31	
Springer	19	5

2024
Rahman et al.
Computers, Software, and Applications Conference (COMPSAC)
Quantum Hardware: **As of my last knowledge update** in September 2021, practical quantum hardware is still in its infancy and may not be readily available for widespread use.¹

2024
Al-Rawashdeh et al.
Journal of Building Engineering
Certainly, here are some potential highlights for your paper.¹

2024
Wang et al.
IEEE Transactions on Instrumentation and Measurement
Certainly, here is a more concise version of the future research directions for dynamic visual SLAM.¹

« D'après ma dernière mise à jour des connaissances »

« Bien sûr, voici quelques potentiels points forts pour votre article »

« Bien sûr, voici une version plus concise »

ChatGPT dans les rapports d'évaluation

« Un rapport d'évaluation publié avec cet article MDPI contient la phrase 'Regenerate Response' de manière inattendue »

#1 Guillaume Cabanac commented May 2023

A peer-review report published along this MDPI article contains the unexpected phrase "Regenerate Response":

Round 2
Reviewer 1 Report

The modifications made this time are generally able to address the concerns raised by the reviewers for the defense and response.

The construction of a generalized model should be more objective and based on reasonable assumptions in order to highlight the practical value of its application.

Regenerate response ←

Author Response

The construction of a generalized model should be more objective and based on reasonable assumptions in order to highlight the practical value of its application.

Response: Thanks for your valuable comments. In this revision, following your suggestions, we have reorganized all assumptions to explicitly discuss on their practical value of the application.

<https://pubpeer.com/publications/E6F750F5DE06F5C90B0455E1AB4563>

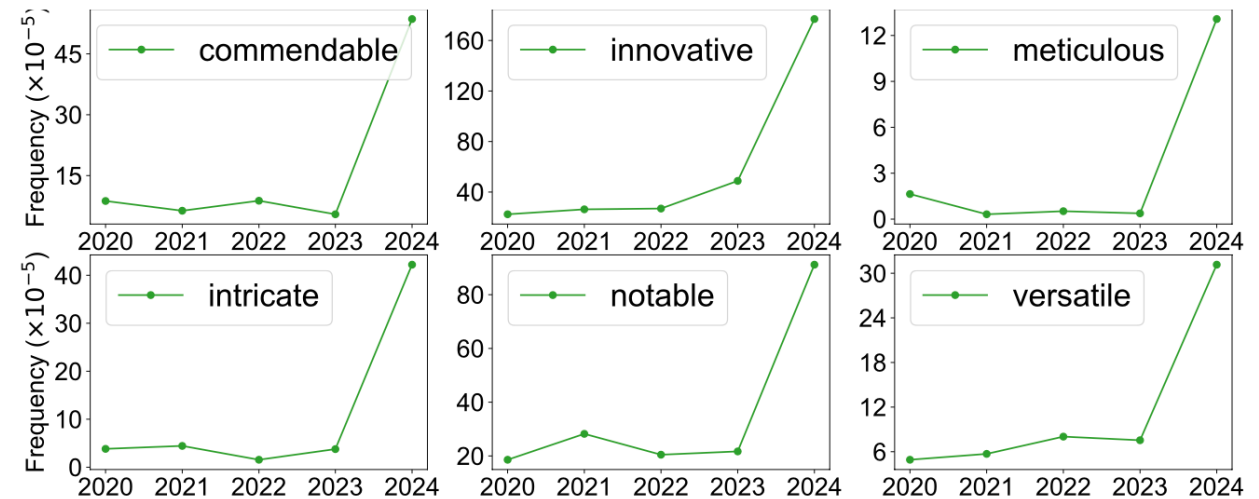


Figure 1: Shift in Adjective Frequency in ICLR 2024 Peer Reviews.

« Nous constatons une évolution significative de la fréquence de certains adjectifs dans ICLR 2024, avec des adjectifs tels que 'commandable', 'meticulous' et 'intricate' dont la probabilité d'apparaître dans une phrase est multipliée par 9,8, 34,7 et 11,2. Nous constatons une tendance similaire dans NeurIPS, mais pas dans les revues Nature Portfolio. »


Adapté de <https://dl.acm.org/doi/10.5555/3692070.3693262>


*« Le nom de l'auteur est Orduna-Malea.
Les mots-clés sont : 'évaluation de la recherche', 'bibliométrie' et 'informétrie'.
Un coauteur est Martin-Martin, mais liste toutes les publications, quel que soit les coauteurs. »*

ChatGPT and the potential growing of ghost bibliographic references

Enrique Orduña-Malea¹ · Álvaro Cabezas-Clavijo²

Scientometrics (2023) 128:5351–5355

 The author's surname is "Orduna-Malea." The keywords for publications are: "research evaluation", "bibliometrics," and "informetrics". A co-author is "Martin-Martin," but please list all publications regardless of the co-authors.

 Thank you for providing more information. Based on your criteria, I have conducted a search on the Scopus database and found the following articles authored by Enrique Orduña-Malea that were published in the journal Scientometrics between 2000 and 2010:

1. Orduna-Malea, E., & Martín-Martín, A. (2010). Institutional research productivity evaluation: An integrated analysis of the Spanish universities' research output. *Scientometrics*, 82(2), 307-319.
2. Orduna-Malea, E., & Martín-Martín, A. (2009). Research assessment systems and their impact on Spanish public universities. *Scientometrics*, 79(3), 683-694.
3. Orduna-Malea, E. (2008). Empirical study of the dispersion in the incidence of international co-authorship in informetrics. *Scientometrics*, 76(3), 491-509.
4. Orduna-Malea, E. (2006). Self-citation and self-reference in science: A review of the literature. *Scientometrics*, 67(3), 391-411.
5. Orduna-Malea, E. (2003). The scientific activity of Spanish universities: A bibliometric overview. *Scientometrics*, 58(1), 199-218.

Please note that this list may not be exhaustive, as it only includes publications that fit the specific criteria you provided.

<https://doi.org/10.1007/s11192-023-04804-4>

« J'ai fait une recherche dans la base de données Scopus d'après vos critères et trouvé les articles suivants. »

Scopus : base de données scientifique renommée
→ Gage de qualité de la réponse

Aucune de ces publications n'existe



Guillaume Cabanac (here and elsewhere) @gcabanac

Ongoing decontamination... Now **RETRACTED**: @PLOSONE article featuring #ChatGPT's "regenerate response" and 18 hallucinated references 🤡. Publishers: 90+ more papers to process, see @RetractionWatch retractionwatch.com/papers-and-pee... CC @Cacciamani_MD @CANGARU_check

Guillaume Cabanac (here and elsewhere) @gcabanac · 12 Mar

#ChatGPT's "Regenerate Response" in the bibliography of a @PLOSONE article. Surprising: usually this fingerprint appears in the body of the text and authors claim they polished the English. Not much to polish in a reference section. Hallucination? pubpeer.com/publications/7...

banac commented March 2024

"Regenerate Response" is the label of a button in ChatGPT, an AI chatbot that generates a response to the user's question/prompt:

article contains the unexpected phrase "Regenerate Response" in reference 62:

Picciano A. G., & Seaman J. (2017). *Blending in: The extent and promise of blended education in the United States*. Babson Survey Research Group. Retrieved from <https://files.eric.ed.gov/fulltext/ED581301.pdf> **Regenerate response**

does not acknowledge the use of ChatGPT. It does not contain any occurrence of 'ChatGPT' or in the acknowledgments, as recommended in this *Nature* and in this *ACS Nano* article. **copy-paste the output of ChatGPT and include the button's label by mistake?**

meaningless wording **survived proofreading** by the coauthors, editors, referees, and reviewers.


Prohibit **ALT** Paper Screener.

Guillaume Cabanac commented March 2024

Here is the metadata given for reference 62:

62. Picciano A. G., & Seaman J. (2017). *Blending in: The extent and promise of blended education in the United States*. Babson Survey Research Group. Retrieved from <https://files.eric.ed.gov/fulltext/ED581301.pdf>, **see:**

These metadata **do not match** the link provided <https://files.eric.ed.gov/fulltext/ED581301.pdf>, **see:**



I found another link <https://files.eric.ed.gov/fulltext/ED529930.pdf> that translates into this reference:

Seaman, J., & Picciano, A. G. (2017). *Blending in: The extent and promise of blended education in the United States*. Babson Survey Research Group.

10:07 am · 20 Apr 2024 · 3,592 Views

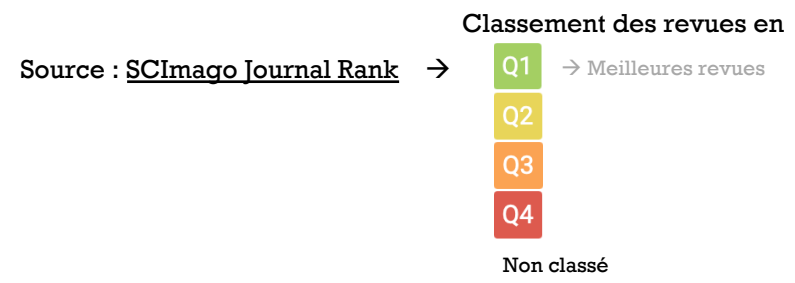
Retraction

Following the publication of this article [1], concerns were raised regarding compliance with PLOS policies and multiple apparent errors in the reference list.

Specifically,

- Concerns were raised about potential undisclosed use of an artificial intelligence tool to generate text in the article due to inclusion of the phrase "regenerate response" and extensive reference list concerns. PLOS was unable to verify 18 of the 76 cited references, and 6 additional references appear to contain errors. The first and corresponding authors stated that the authors were responsible for the manuscript content and that the only AI tool used during manuscript preparation was Grammarly, to improve language. They provided replacement references but several of the replacements did not appear to support the corresponding statements in the article.

« PLOS n'a pas pu vérifier l'existence de 18 des 76 références citées, et 6 autres références comportent des erreurs. »



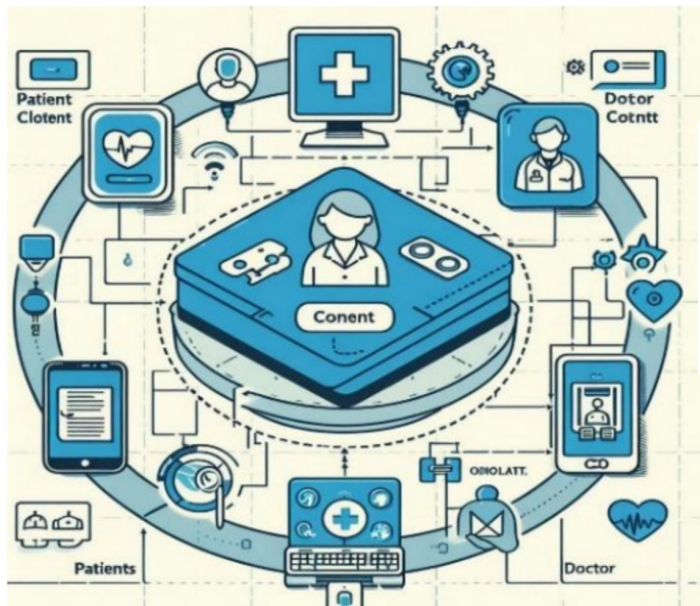
Plus que le texte : la génération d'images

Possibilité de générer des illustrations
→ Souvent peu informatives voire fausses

#1 *Nerita vitiensis* comment accepted February 2025

This IEEE conference paper appears to contain AI-generated content.

Firstly, Figure 3.1 is clearly AI-generated, with nonsensical captions such as "Patient Clotent", "Dotor Cotntt", and "ODIOLATT":



Dotor Cotntt
Patient Clotent
Conent

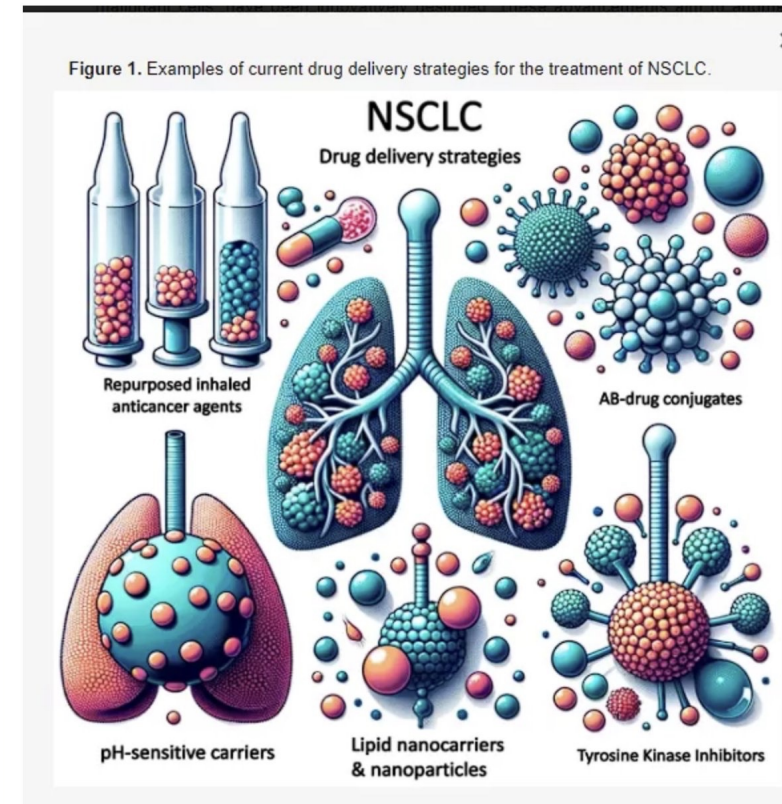
Déformation de
'content' (*contenu*) ?

<https://pubpeer.com/publications/4921160BA96544085440AE25B95A18>

#1 *Gymnidium turbinatum* commented April 2024

Figure 1 was AI-generated. It does not make any sense

<https://doi.org/10.3390/pharmaceutics15122777>



« *Stratégies d'administration de médicaments* »

<https://pubpeer.com/publications/8026AE8D42C97065E13C577DA4F4C7>

Commerce d'articles frauduleux : les moulins à papiers ou « Paper Mills »

Annealing Temperature Effect on Structural, Magnetic Properties and Methyl Green Degradation of Fe₂O₃ Nanostructures

Arabian Journal for Science and Engineering (2023) - 2 Comments
doi: 10.1007/s13369-022-07118-4 issn: 2193-567x issn: 2191-4281

#1 N. H. Wise comment accepted August 2023

On the 26th of January 2022 an advert was placed on Facebook selling authorship of a paper with this title.

26 January 2022 · 🌐

Co-Authors Participation

- 📌 50 USD discount per position
- 📌 1st author: 850 USD 👉 Final price: 800 USD
- 📌 3rd author: 750 USD 👉 Final price: 700 USD
- 📌 5th author: 650 USD Final price: 600 USD

Indexing: Scopus, Web of Science

Title: Annealing temperature effect on structural, magnetic properties and methyl green degradation of Fe₂O₃ nanostructures

🌱 IF = 2.334

<https://pubpeer.com/publications/C95132A71315B0E6BA1E3E34A806DB>

« Le 26 janvier 2022, une publicité a été publiée sur Facebook vendant la paternité d'un article avec ce titre. »

« *Participation de co-auteurs*

📌 Réduction de 50\$ par position

📌 1er auteur : 850\$ 👉 Prix final : 800\$

📌 3ème auteur : 750\$ 👉 Prix final : 700\$

📌 5ème auteur : 650\$ 👉 Prix final : 600\$ »

Bases scientifiques renommées

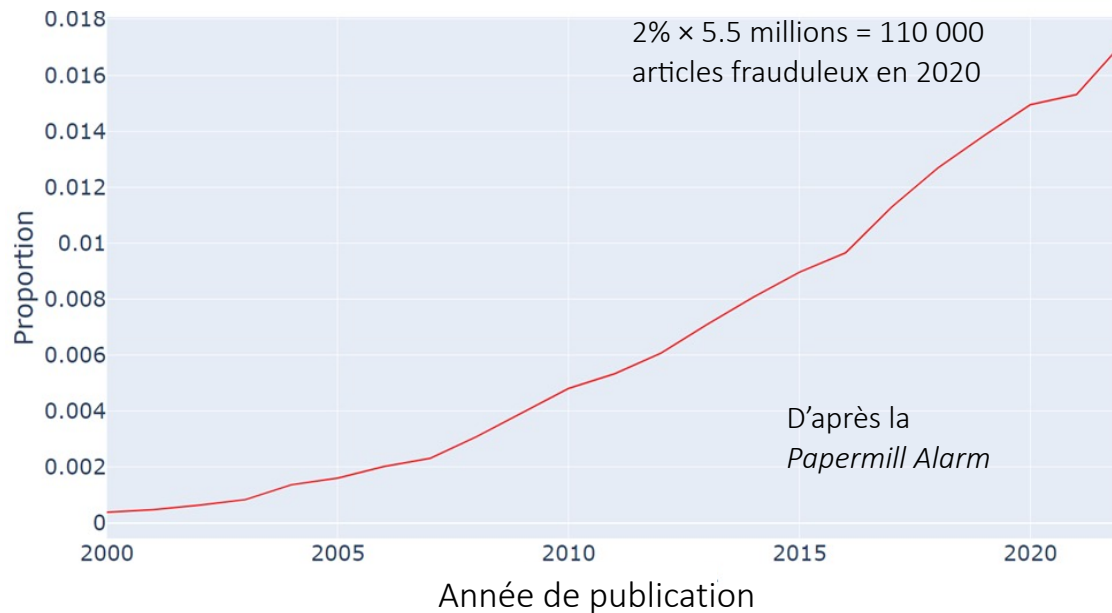
Mention d'Impact Factor

Arguments commerciaux sur la qualité (supposée) de la revue

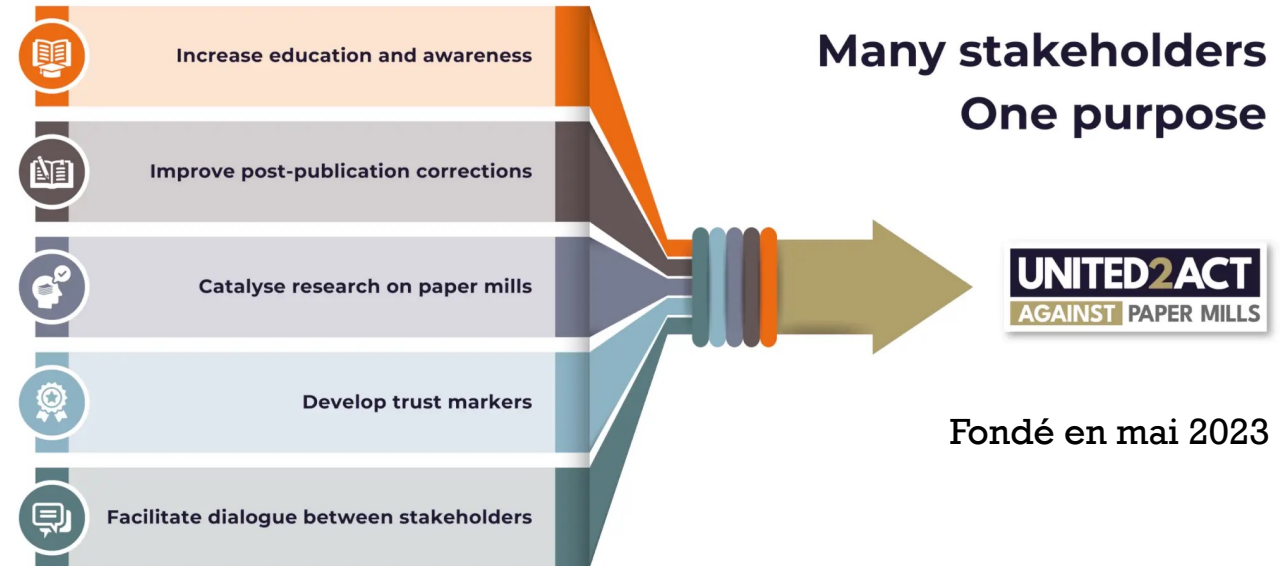
Commerce d'articles frauduleux : les moulins à papiers ou « *Paper Mills* »

1,5% de la littérature scientifique
polluée par les *paper mills*

Production mondiale des moulins à papiers



Adapté de <https://clear-skies.co.uk>



« Les paper mills constituent une véritable menace pour l'intégrité des publications scientifiques. Un effort collectif est nécessaire car aucune partie prenante ne peut résoudre ce problème à elle seule. »



Anna Abalkina: **Fraud buster**

This Russian science sleuth spots fake papers and hijacked journals.



nature

COMMENT | 27 January 2025

'Stamp out paper mills' – science sleuths on how to fight fake research

A group of scientists who are experts at spotting fraudulent research outline five essential steps to combat industrialized scientific misconduct.

By [Anna Abalkina](#), [René Aquarius](#), [Elisabeth Bik](#), [David Bimler](#), [Dorothy Bishop](#), [Jennifer Byrne](#), [Guillaume Cabanac](#), [Adam Day](#), [Cyril Labbé](#) & [Nick Wise](#)



- Research to understand mills
- Educate stakeholders
- Ensure best practice in publishing
- Hold bad actors to account
- Fund counteractive measures

No cure in sight

These steps can hold back the tide. But as long as numbers of papers and citations remain the rewarded goal of scientific activity, there is an incentive for people to game the system. A structural shift in science is needed, if we are to wipe out commercialized fraud. Such a seismic shift will require conversation and collective actions between all stakeholders, to find new ways to assess and reward researchers.