



## Could ChatGPT help you to write your next scientific paper?: concerns on research ethics related to usage of artificial intelligence tools

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More and more people try to use artificial intelligence (AI) tools such as ChatGPT (Chat Generative Pretrained Transformer; OpenAI) for scientific writing<sup>1</sup>. Whether you agree or disagree with the AI tool usage, it is becoming irresistible that ChatGPT can help to generate a lot of research and scientific articles and you might need to use this powerful tool to increase your productivity and the quality of your works. However, there has been sharp disagreement over ChatGPT being listed as author on research papers<sup>2-5</sup>. As soon as ChatGPT was released as a free-to-use tool in November 2022, at least four articles credit the AI tool as a co-author<sup>6-9</sup>. The ethical issue on the authorship was raised among the society of scientific article publishing groups and journal editors, researchers, and publishers are now debating the place of such AI tools in the published literature, and whether it's appropriate to cite the chatbot as an author.

ChatGPT can write academic essays, summarize research papers, and can even answer questions to pass medical exams. It has produced research abstracts that scientists found it hard to spot that a non-human AI had written them. However, it could also make spam, ransomware, and other malicious outputs<sup>4</sup>. The Chatbot can cite low quality studies containing false numbers, but sound convincing enough to trick human readers. The most worrisome fact is that journal publishers, peer reviewers, and readers of the journal do not have any

censoring machinery or screening tools to detect those errors.

Therefore, the major high-impact journal publishers started to announce their policies since January this year especially about the AI usage and declaration in the submitted articles. (Table 1) The journal *Science* warned researchers in their Editorial article that submitting any manuscripts that have been produced using these tools amounts to scientific misconduct<sup>2</sup>. *Science*'s editor-in-chief, Holden Thorp, announced an editorial policy statement that all paper submissions must be the original work of authors, and that content produced by AI is a form of plagiarism. Authors may use the tool only if they have fully disclosed it and *Science* has approved it. The journal *Nature* has also introduced similar rules and will not accept any papers listing ChatGPT or any other AI software as authors but hasn't banned these types of tools completely. *Nature* mentioned that researchers using large language model (LLM) tools should document this use in the methods or acknowledgements sections<sup>3-5</sup>. If a paper does not include these sections, the introduction or another appropriate section can be used to document the use of the LLM. Elsevier, which publishes about 2,800 journals, including *Cell* and the *Lancet*, has taken a similar stance to the previous two journals, *Science* and *Nature*. Its guidelines allow the use of AI tools "to improve the readability and language of the research article, but not to replace key tasks that should be done by the authors, such as interpreting data or drawing scientific conclusions," said Elsevier's Andrew Davis, adding that authors must declare if and how they have used AI tools.

Hopefully, there are screening solutions currently being developed by the big publishers as well. Springer Nature is currently developing its own software to detect text generated by AI. Meanwhile *Science* said it would consider using detection software built by other companies. Although *Journal of the Korean Association of Oral and Maxillofacial Surgeons* (JKAOMS) has not opened its official policy for AI usage

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**Table 1.** The major scientific journal publishers' policy on usage of artificial intelligence (AI) tool

Journal publisher	Journal's policy statement	Date of statement
AAAS (American Association for the Advancement of Science; publisher of <i>Science</i> )	We would not allow AI to be listed as an author on a paper we published, and use of AI-generated text without proper citation could be considered plagiarism.	26 January 2023 ( <i>Science</i> 2023;379:313) <sup>2</sup>
Springer Nature (publisher of <i>Nature</i> )	ChatGPT doesn't meet the standard for authorship. Authors using LLMs (large language models) in any way while developing a paper should document their use in the methods or acknowledgements sections.	24 January 2023 ( <i>Nature</i> 2023;613:612) <sup>5</sup>
Elsevier (publisher of <i>Cell</i> and <i>Lancet</i> )	The use of AI tools can improve the readability and language of the research article but cannot replace key tasks that should be done by the authors, such as interpreting data or drawing scientific conclusions. AI and AI-assisted tools cannot be credited as an author on published work.	March 2023 (authorship policy updated; <a href="https://www.elsevier.com/about/policies/publishingethics">https://www.elsevier.com/about/policies/publishingethics</a> )

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for the manuscript writing, the editorial office recommends that the authors and readers should be careful to use the LLM Chatbot and please clarify any usage of the tool. Furthermore, please do not list AI tools in the author list. *JKAOMS* will soon update its policy and keep an open mind regarding the future usage of the LLM tools in scientific writing.

### Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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