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Submitter Information

Organization: Frontiers

General Comment

Frontiers welcomes the opportunity to respond to this important request for information, which poses critical questions about the opportunities, challenges, risks, and benefits of artificial intelligence (AI).

Frontiers is the fifth most cited scientific research publisher worldwide and the publisher of over 200 peer-reviewed academic journals, all of which are made available online immediately, without embargo.

The attached file describes why the practice of Gold Open Access publishing is the best option for AI at scale. The file also provides recommendations for strengthening public access to federally funded research.

Frontiers looks forward to assisting with the creation of the 2025 National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan.

Sincerely,

Julia Kostova, PhD
Director of Open Science Solutions, USA

Tom Ciavarella
Head of Public Affairs, North America

Attachments

FRONTIERS_response_NITRD_NCO_Docket_ID_No_NSF-2025-OGC-0001

Response to the Networking and Information Technology Research and Development (NITRD) National Coordination Office (NCO), National Science Foundation, on behalf of the Office of Science and Technology Policy (OSTP)

Request for Information on the Development of a 2025 National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan

Docket ID No. NSF-2025-OGC-0001

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May 29, 2025

About Frontiers

Frontiers welcomes the opportunity to respond to this important [request for information](#), which poses critical questions about the opportunities, challenges, risks, and benefits of artificial intelligence (AI).

Frontiers is the fifth most cited scientific research publisher worldwide and the publisher of over 200 peer-reviewed academic journals¹, all of which are made available online immediately, without embargo.

This publishing practice, known as open access (OA), is one of the primary tenets of the Open Science movement, which aims to make research outputs – and data, source code, equipment, and more – easier to find and build upon.

At its 2007 launch, Frontiers was an OA pioneer. Today, OA is a mainstream model for disseminating research, and openly sharing data is increasingly viewed as a critical pillar for consuming and analyzing research, especially as machine-learning methods improve.

Importantly, this openness coexists with commercial interests. Frontiers is a for-profit company incorporated in Texas² with staff across the United States and offices worldwide. We advocate for American science policy that promotes research integrity, data security, entrepreneurship, and private-sector innovation.

¹ [Frontiers 2024 annual report](#)

² Frontiers Media Inc., 4600 Greenville Avenue, Suite 250, Dallas, TX 75206

More broadly, as an Open Science publisher, Frontiers is above all a knowledge, information, and technology company. We made the founding decision to build our own Open Science platform and continually to develop, improve, and customize it as we meet the evolving needs of the scientific community.

Frontiers is a pioneer in AI, having built the first in the industry and best-in-class tool³ to improve peer review quality, and to strengthen our collaboration with other publishing stakeholders.

Summary: Gold Open Access Is the Best Option for AI at Scale

Our position on AI, as it pertains to the 2025 National AI R&D Strategic Plan (hereafter “the Plan”), is three-fold:

First, better data inputs result in better AI outputs.

- When AI and large language models (LLMs) are trained on content that is scientifically accurate, validated, verified, peer reviewed, and tested by public opinion, all parties – and especially American taxpayers and entrepreneurs – will benefit from generative results that are more accurate and appropriate.
- Frontiers, and more broadly Open Science, provides access to such high-quality, well-structured, and metadata-enriched content – data that can fuel quality growth of AI models. We do this with industry-leading editorial rigor, technology, and expertise, and a robust peer review underpinned by industry-wide ethical standards.

Second, the Plan should compel scientific publishers to provide more and better inputs to train AI and LLMs.

- Open Science can – and should – be delivered by more than one publishing model. But in judging those models, the Plan must compare them for efficiency, scalability, and public value for money, as well as utility for AI.
- Gold Open Access publishing (hereafter “Gold OA”) is the most effective model for securing those goals. In publishing Gold OA content under a Creative Commons Attribution (CC BY) license⁴, and in doing so creating publications that are easily searchable and ingestible, Frontiers has long presumed that all of our published content is already being used to train AI and LLMs.
 - A 2023 analysis⁵ of C4, the Google dataset used to train AI and LLMs, showed that 9% of C4 contains science and health content, and within that subset, Frontiers content is the second-most

³ 2020: Do You Have a Conflict of Interest? This Robotic Assistant May Find It First

⁴ <https://creativecommons.org/licenses/by/4.0/>

⁵ [Inside the secret list of websites that make AI like ChatGPT sound smart](#)

prominent resource, trailing only another Gold OA publisher, the Public Library of Science (PLOS).

- The opportunity for higher-quality AI and LLM inputs is being squandered by a legacy scientific publishing system that locks scientific knowledge behind paywalls, slowing down the societal and commercial benefits.

And third, attribution strengthens trust in AI.

- Applying attribution to AI outputs – and doing so in a way that is easily accessible to the end user and the rights holder – is both reasonable and commercially compelling. Transparency garners trust.
- Our authors' creative and intellectual contributions do not exist in a vacuum; they are the start of new ideas and the continuation of other ideas. Every research paper is augmented by robust editorial oversight, rigorous peer review, and immediate testing in the court of public opinion, all of which sharpen the quality and impact of new published knowledge.
- The effectiveness of that scientific collaboration is founded on attribution – and the ability to trace, test, cite, and develop the science. A growing corpus of AI and LLM outputs that attributes authors will be key to scientific collaboration at scale.

Additional Benefits of Gold OA

Gold OA offers a consistent, transparent, and competitive means to unlock the benefits of fully accessible science.

There is a direct economic benefit to greater access to research:

1) Independent analysis has shown that **Gold OA is more financially efficient than hybrid subscription models**. A March 2025 report from the research firm Delta Think⁶ shows that Gold OA article processing charges (APCs) are 64% of those charged by hybrid journals – a trend that has held historically.

The Delta Think report also found that the maximum APC for hybrid titles is \$12,690 compared to \$8,900 for Gold OA journals – and within that range, fully OA publishers are consistently on the lower end on the APC price spectrum.

2) **The Gold OA model requires only a one-time investment** when an article is published, making that content freely available perpetually. By contrast, hybrid subscription contracts typically require multiple recurring payments, including annual fees to keep journal articles behind paywalls and to limit access to a particular academic or institutional population.

Institutions currently managing subscription budgets to allow their researchers access to paywalled knowledge can shift those funds to publication budgets

⁶ <https://www.deltathink.com/news-views-open-access-charges-price-increases-back-on-trend>

supporting Gold OA, thereby funding the distribution of knowledge rather than its consumption.

Strengthening Public Access to Federally Funded Research

Frontiers supports the continued implementation of the Office of Science and Technology Policy (OSTP) August 2022 policy guidance⁷ to Executive branch departments and agencies requiring immediate public access to publications and data resulting from federally funded research. We believe the guidelines enable innovation and speed up discovery, and in the context of this RFI, are aligned with the strategic priority of AI.⁸

These guidelines represent a significant advancement from OSTP's February 2013 guidance⁹ by supporting the transition to fully open scientific communication for the benefit of all parts of society.

Public access policies remove financial barriers that would otherwise prevent American taxpayers from accessing scientific research; as such, these policies empower individuals and small businesses to make informed decisions for themselves. With public access, American companies in sectors deemed vital to US national security will have immediate access to high-quality scientific research that is necessary to maintain their competitiveness.

Scientific research publishers such as Frontiers have for decades successfully provided researchers with secure and accessible Open Science infrastructure and can provide federal agencies and Congressional lawmakers with valuable insights to address and resolve technical or security-related concerns.

We believe the 2022 guidelines can be strengthened in the following ways:

- 1) That the funds set aside in federal grants for publications support Open Science practices generally and Gold OA publishing specifically, preferably with the CC BY license as the default and with provisions to make case-by-case exceptions.
- 2) Regarding embargoes, Frontiers advocates in favor of immediate public access to research supported by federal funds. If the 2022 guidelines are rescinded, the OSTP guidelines from over a decade ago remain actionable. Those 2013 standards allow for a 12-month embargo on articles resulting from federally funded research. This would create confusion among the administration and individual federal agencies, many of which have already adopted public access guidelines as mandated by OSTP's 2022 action and as demanded by a growing number of researchers.
 - a. OA emerged precisely to correct the inadequacies of the subscription model of disseminating research. The shift toward OA represents an opportunity to expand access to knowledge – not just between researchers or within academic and federal

⁷ 2022: [Ensuring Free, Immediate, and Equitable Access to Federally Funded Research](#)

⁸ 2022: [Unlocking US science for healthy lives on a healthy planet](#)

⁹ 2013: [Increasing Access to the Results of Federally Funded Scientific Research](#)

institutions, but also in service to small businesses and the public as a whole.

- 3) The 2022 OSTP guidance mandates that not only the article be made publicly available immediately but the underlying data of that article as well. Many repositories are set up for article deposits but not for data deposits. As such, full implementation of the OSTP standards should include infrastructure investment funding to ensure that the data is as accessible as the version of record article.

Frontiers is a Pioneer in AI for Scholarly Publishing

AI can empower all Americans, but public trust in science will be key. At Frontiers, we apply our AI tools to help establish that trust.

Our Artificial Intelligence Review Assistant, or AIRA¹⁰, provides Frontiers' editors and reviewers with new perspectives as they decide whether to put a research paper through our rigorous and transparent peer review process.

AIRA verifies that scientific knowledge is accurately and honestly presented even before our people decide whether to review, endorse, or publish the research paper that contains it.

Frontiers receives hundreds of thousands of manuscript submissions annually. AIRA receives every manuscript and makes up to 20 checks per second. These checks cover, among other things, language quality, the integrity of figures and images, plagiarism, and conflicts of interest. The results give editors and reviewers another perspective as they decide whether to put a research paper through our rigorous and transparent peer review process.

Frontiers is continuously improving and customizing our AI services to meet the evolving needs of the scientific community and to meet the public appetite for accountability, transparency, trust, and security.

Frontiers Advocates for Legislative Solutions to AI Implementation

Frontiers welcomes¹¹ the bipartisan CREATE AI Act¹² to expand access to AI research in the United States. Such efforts show foresight, creativity, and the chance to properly assess how to make responsible AI available for all.

The bill proposes new national infrastructure that gives researchers, academics, startups, and students much-needed access to the computing power, resources, data, and tools needed to develop safe and trustworthy AI.

¹⁰ 2020: [Artificial Intelligence to help meet global demand for high-quality, objective peer-review in publishing](#)

¹¹ [Open access research publisher Frontiers welcomes a bipartisan bill to expand access to artificial intelligence research in the US](#)

¹² [Creating Resources for Every American To Experiment with Artificial Intelligence Act of 2023](#)

The ambition to expand research on this cutting-edge technology to the best and brightest minds in the US chimes loudly with our mission as an Open Science research publisher.

Julia Kostova, PhD
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Tom Ciavarella
Head of Public Affairs, North America