National Institutes of Health
6705 Rockledge Drive, Suite 630
Bethesda, MD 20892

September 15, 2025

Submitted via electronic form.

Dear Director Bhattacharya and NIH team:

Frontiers welcomes the opportunity to respond to the "Request for Information on Maximizing Research Funds by Limiting Allowable Publishing Costs" (NOT-OD-25-138). As a leading Open Access publisher and Open Science platform, Frontiers is proud to support NIH-funded researchers by publishing their work in fully Open Access journals, thereby increasing the visibility, accessibility, and impact of NIH-supported science.

Nearly two decades ago, Frontiers was founded on the conviction that scientific publishing can—and must—deliver meaningful value to researchers, funders, and the public. Best practice publishing in the 21st century goes far beyond traditional peer review. It must include rigorous research integrity checks, transparent peer review that enhances accountability, automated metadata, data curation and management, perpetual archiving, machine readability, and full AI readiness; and above all full accessibility on the day of publication – in full alignment with the NIH policy. These services ensure the integrity of the scientific record while maximizing the return on taxpayer investment.

A full 40 years after the creation of the internet, invented to accelerate the exchange of scientific knowledge, academic publishing, continues to suffer from a legacy of opaque pricing structures, subscription-based restrictions, and inadequate transparency—problems that have undermined public trust and limited equitable access, and hindered the field's ability to fulfill its vital role: effectively disseminating and safeguarding the integrity of the scientific record.

Under your leadership, the situation is rapidly evolving. The NIH is moving resolutely in the right direction, for example, with its recent public access policy that ensures taxpayer-funded research is available to all on the day of publication. This is essential not only to accelerate the research-to-innovation cycle but also to tackle pressing health challenges more effectively.

Gold Open Access is the most effective and scalable model to realize these goals. It ensures immediate and universal access, provides interoperable formats consistent with an AI-driven research environment, and creates a competitive, transparent marketplace for publishing services.

On a per-article basis, Article Processing Charges (APCs) already represent the most transparent and cost-effective approach compared with subscription-based models. A full transition to Gold OA would generate substantial savings for governments and taxpayers (see Figure 3 below) by removing redundant subscription expenditures and shifting costs toward research-intensive institutions that are best positioned to manage them.

Frontiers and other publishers have pioneered institutional agreements, including "flat-fee" models, that allow unlimited publishing for affiliated researchers within a defined contractual period. These agreements provide flexibility, predictability, and efficiency for institutions while preserving researcher choice in publication venues. We believe that approaches like these—*not* artificial price controls—are the most effective means to ensure sustainability, quality, and cost-effectiveness in publishing.

By contrast, mechanisms such as APC caps would be counterproductive. They risk undermining publishers' capacity to invest in innovation, including the technologies necessary to ensure research integrity, enhance reproducibility, and adapt to the rapidly evolving scientific landscape. This is particularly critical as artificial intelligence reshapes discovery and publishing workflows. Curtailing investment now would slow progress at precisely the moment when innovation is most needed. For those reasons, Frontiers cannot endorse caps in principle, nor as laid out in the proposed options.

Frontiers applauds NIH's commitment to maximizing the value of federal research funding and strongly supports its leadership in advancing public access. We urge NIH to continue supporting Gold Open Access as the most effective, transparent, and future-ready model for disseminating taxpayer-funded science. Gold OA is a proven and reliable model — the clear direction of travel for scientific publishing. It has grown to represent more than half of global output in the two decades since its adoption, chosen by funders, institutions, and researchers as part of an intentional shift to increase impact, transparency, and equity in science.

Sincerely,

Dr. Frederick Fenter

Chief Executive Editor, Frontiers

Questions:

Q1. The option, or other option not considered here, that best achieves the goal of balancing flexibility in providing research results with maximizing the use of taxpayer funds to support research

The issue is not only to maximize the use of funds, but also to obtain the best return on investment for the federal dollars granted to researchers.

Gold open-access publishing is cost-effective and aligned with the principles and objectives of the NIH. The reaction to the cost of an APC is driven by the fact that people are seeing transparently, often for the first time, a dollar figure for the cost of quality publishing services. Gold open access is the one segment of the publishing ecosystem that already aligns with the principles of a functional and competitive marketplace for editorial services.

We believe that none of the five options described will provide the balance the NIH is looking for, because price caps will have a detrimental effect on best-practice publishing.

In this document we address with evidence the overall question of price caps as well as provide specific comments on some of the options that present particular risk to the ability of professional open access publishers to deliver best practice publishing services.

Option 1: Reliance on preprints as final outputs:

Preprints are valuable for rapid dissemination but lack the essential validation that peer review provides. Disclaimers such as “not peer reviewed” are insufficient safeguards, particularly in an era of automated content analysis. The proliferation of preprints would create confusion among researchers and the public about what constitutes reliable scientific findings; further undermining public trust in science.

In addition, under this preprint scenario, the final version of record, if ultimately published by a subscription publisher, will only be available via paid access, which does not further the principles that the NIH defends.

Best practice publishing, protecting the scientific record and correcting problems when they arise done by specialized organizations has a cost.

Disallowing APCs would push NIH researchers toward closed, subscription publication venues or into poorly curated repositories where discoverability, quality assurance, and curation are limited, putting NIH-funded scientists will find themselves at a disadvantage vis-à-vis their international peers.

In contrast to private funders, a public funder like the NIH has a responsibility to the research system as a whole and to the public benefits of science. Guaranteeing the public access to the version of record of the funded research is part of that stewardship role.

Options 2 and 4:

We understand NIH's focus on publishing costs as part of maximizing the impact of research funding and ensuring responsible use of taxpayer dollars. We recognize concerns about high fees charged by some publishers. However, imposing caps risks penalizing innovative publishers like Frontiers, which have shown that Open Access can be delivered affordably. For these reasons, and given the unintended consequences such measures would create, we cannot support the introduction of caps. Here are our considerations:

* **Capping APCs undermines access.** Based on a Frontiers analysis of over 11,000 journals from the 10 largest publishers, more than 75% had a 2025 list price APC of greater than the proposed NIH price cap of $2,000. Limiting support for APCs would have the same effect of pushing NIH researchers toward closed, subscription publication venues or into poorly curated repositories where discoverability, quality assurance, and curation are limited, putting NIH-funded scientists at a disadvantage vis-à-vis their international peers. Both outcomes are misaligned with NIH's goals of openness, transparency, and rigor.

* **Caps favor large publishers, disadvantaging innovative Open Access publishers, societies and non-profit publishers, and risk driving further consolidation.** Caps would advantage large publishers that can rely on economies of scale and existing market share, while disadvantaging smaller and more innovative players. They would also raise barriers for new entrants, accelerating consolidation and reducing the competition and innovation that the system needs.

Option 5:

* **Caps create perverse incentives.** Setting an artificial cap – even at a high monetary level - establishes a price point to which all offerings below it will drift to - removing incentives to lower costs or innovate in service delivery, as past examples have demonstrated.[1] Over time, this will likely drive prices up rather than down, erode quality, and discourage differentiation by value. The result would be higher costs to the NIH for the same services had they been provided in a competitive marketplace. This option clearly runs counter to NIH's mission of maximizing the impact of federally funded science.

We also point out that subscription models remain significantly more costly on a per-article basis than Gold OA APCs. Restricting investment in APC-based publishing would therefore reinforce the

[1] One notable recent example is the tuition cap of 9,000 GBP introduced by the UK in 2012-2013. A parliamentary report found that, "While there was some initial variation in fee levels, this soon disappeared as universities charging below the cap level ultimately increased fees to the maximum amount in line with the rest of the sector. In 2012/13 just under two-thirds of universities charged the maximum £9,000 fee for some or all of their undergraduate courses. By 2016/17, only one university had maximum fees below £9,000." Ultimately, the introduced caps resulted in an overall increase in cost. Joe Lewis, Paul Bolton, Siobhan Wilson. Tuition fees in England: History, debates, and international Comparisons. Commons Library Research Briefing, UK Parliament. Accessed Sept 15, 2025. https://researchbriefings.files.parliament.uk/documents/CBP-10155/CBP-10155.pdf.

dominance of entrenched paywall publishers while weakening the growth of open access alternatives.

Below we have mapped out the likely outcomes of APC caps for NIH-funded authors, along with their likely consequences for authors, costs, and the scholarly communications ecosystem writ large. The scenarios clearly demonstrate that caps would have a lot of unintended negative consequences for science.

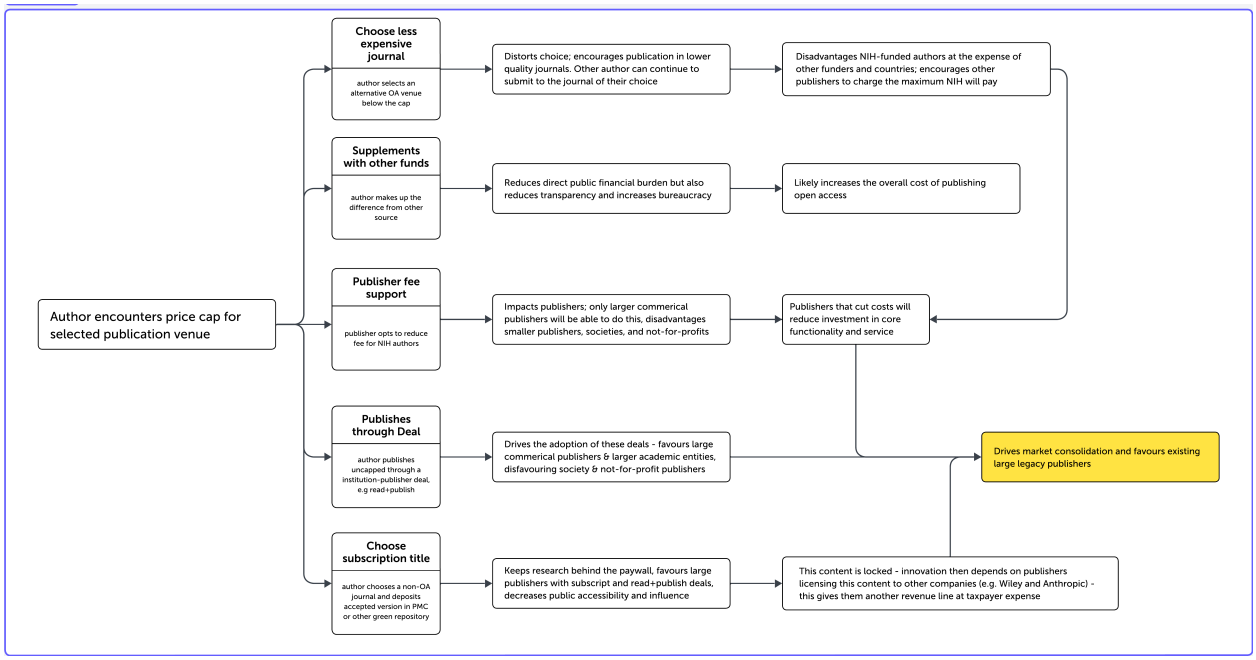


Figure 1: Likely unintended consequences of APC price caps for researchers.

In contrast to the options discussed above, APCs and Gold open access are mechanisms that support a functional market because they introduce the necessary transparency and maximize the value for taxpayer funded research.

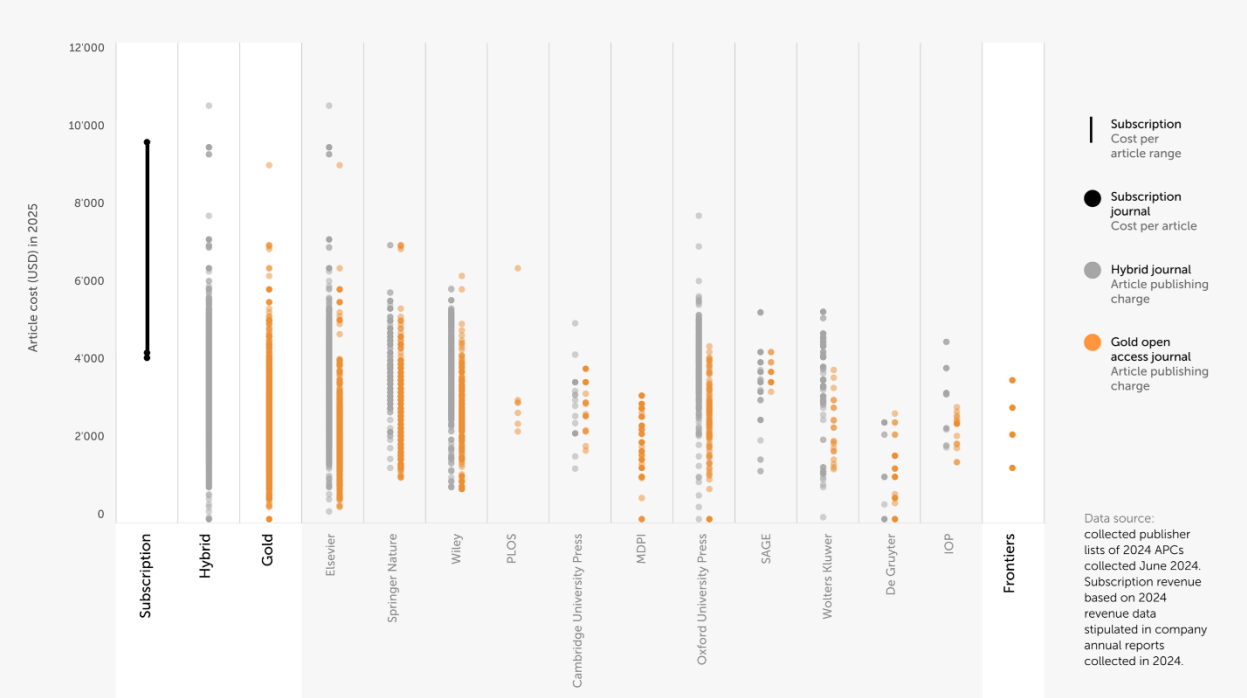
* **APCs offer transparency.** APCs remain the most transparent and accountable model for financing open access publishing. Unlike opaque subscription or hybrid pricing, APCs provide a clear value-for-service model that directly aligns with NIH's priority of cost transparency. APCs are straightforward, fair, and scalable: researchers and institutions know exactly what they are paying for, and costs are tied to the act of publishing, not bundled into expensive packages with unrelated content and services.

At Frontiers, we have continually evolved APC models in collaboration with institutions, offering tailored agreements, flexible models, and new approaches to broaden access and meet diverse needs. This flexibility demonstrates that APCs and APC-based models can be sustainable while preserving transparency, and we urge NIH to continue to support them, and not limit them.

* **Gold OA maximizes value.** While we understand NIH's focus on controlling costs for its public access plans, we note that Gold Open Access is the most efficient and impactful model for delivering on NIH's goals on public benefit while maximizing value for funding dollars. It ensures immediate access, with articles deposited in repositories and enriched with persistent identifiers and machine-readable metadata to meet FAIR standards of findability, accessibility, interoperability, and reuse.

Further, independent analysis confirms its cost advantage: a March 2025 Delta Think report found that Gold OA APCs average just 64% of those charged by hybrid journals, with even the highest Gold-APC significantly lower than those of hybrid ($8,900 versus $12,690).[2] These findings were confirmed by another independent analysis earlier this month.[3] Innovative fully OA publishers such as Frontiers, also consistently price at the lower end of the APC spectrum, proving that Open Access can be delivered affordably, as shown in the APC analysis below.

Figure 2: APC prices for Gold and Hybrid Open Access at leading publishers benchmarked against the price of subscription publishing



Gold OA accelerates innovation by fueling AI.[4] By ensuring that research outputs are peer-

[2] Delta Think. "Open Access Charges – Price Increases Back on Trend." March 13, 2025, accessed Sept 15, 2025. https://www.deltathink.com/news-views-open-access-charges-price-increases-back-on-trend.
[3] Scholarly Communications Lab. "NIH to Cap Article Processing Charges (APCs) for Grantees." September 3, 2025. https://www.scholcommlab.ca/2025/09/03/nih-apc-caps/.
[4] Better inputs mean better outputs. A 2023 analysis 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 prominent resource, trailing only another Gold OA publisher, the Public Library of Science (PLOS). Kevin Schaul, Szu Yu Chen, and Nitasha Tiku, "Inside the secret list of websites that make AI like

reviewed, validated, openly licensed, and enriched with structured metadata, Gold OA provides the high-quality inputs needed to power AI, machine learning, and computational methods. This positions NIH-funded science to directly support the Administration's priorities in AI, open data, and global competitiveness.

*** Gold OA is a proven and reliable model**: it's the direction of travel for scientific publishing. It has been successful for a reason - funders, institutions and researchers have chosen the model as part of an intentional market shift to increase scientific impact. In the 20 years since Gold OA was adopted by researchers globally it has grown to represent over 50%.
In short, limiting APCs would not lower costs system-wide; it would erode accessibility, diminish equity, and ultimately reduce the return on taxpayer-funded research. It is vital that the funding of public access is as efficient, scalable, and as good a value for money as possible, and in our view, Gold OA publishing is the most effective way of securing that outcome. It offers a simple, transparent, and competitive way to unlock the benefits of fully accessible science. We therefore urge the NIH to continue to invest in disseminating research through APCs.

Option 3: See our response to Q3 below.

Q2: Any evidence (either from your own work or other publicly available sources) that can be publicly shared that addresses the considerations of one or more of the options;

Publishing done right comes at a cost, and it is important to consider the cost inputs that Frontiers, like other publishers, account for when setting APCs. Publishers deliver a range of services across the research workflow that ultimately creates impact for both researchers and funders. But some of them are invisible, and thus easy to overlook. Here are the main services that APCs cover at Frontiers:

- **Editorial and peer review management.** Coordinating rigorous peer review, supporting editors and reviewers with tools and training, and ensuring reviews are fair, timely, and transparent.
- **Research integrity safeguards.** Designing software and running systematic submission checks, operating integrity teams, and deploying automated tools such as plagiarism detection, image forensics, and fraud detection systems.
- **Data validation and funder compliance.** Supporting data sharing and verification, integrating funder and institutional mandates into workflows, depositing manuscripts and otherwise ensuring articles and data comply with open science policies.

ChatGPT sound smart." Washington Post. April 19, 2023. Accessed Sept 15, 2025. https://www.washingtonpost.com/technology/interactive/2023/ai-chatbot-learning/

- **Technology and innovation.** Developing and maintaining digital platforms, AI tools to assist authors, reviewers, and editors, and new publishing models that expand access and efficiency.
- **Production, metadata and discoverability.** Enriching article metadata, assigning persistent identifiers (DOIs, ORCIDs, funder IDs), and depositing articles in repositories to ensure compliance with FAIR standards of findability, accessibility, interoperability, and reuse.
- **Preservation and archiving.** Ensuring long-term accessibility through deposition in trusted repositories and durable preservation infrastructure.
- **Author and community support.** Providing support for authors, editors, institutions, and funders, by disseminating and promoting their research, and investing in outreach to support open science practices globally.
- **Honoraria and awards**

It is worth noting that rejections also incur substantial costs from reviewing and triaging papers that end up being rejected. Those costs are also covered by our APC revenues. More information on what our APCs cover can be found on our website, here.

Frontiers offers all of these services at a cost that is fair and competitive (see Figure 2). Nevertheless, even for an organization that operates with the efficiency and scale of Frontiers, the proposed APC levels would not cover the actual costs of publication.

We understand NIH's concern about addressing publication costs it views as excessive. However, applying uniform measures across all journals and publishers — including those that have prioritized high quality and fair pricing — risks undermining the very innovation and efficiency that new entrants like Frontiers have introduced to scholarly communications.

* **Reducing support for APCs puts research integrity at risk and undercuts public trust in science**. As the Gold Standard Science Executive Order emphasizes, only validated, transparent, high-quality research — free from manipulation, fabrication, and misconduct — can sustain trust in science. Yet threats such as paper mills are growing, and safeguarding the academic record requires constant investment and innovation. At Frontiers, this includes expanding AIRA, our AI-assisted Research Integrity Assistant, and maintaining one of the largest dedicated integrity teams in the industry. These efforts demand substantial financial and human resources. Limiting APC support would inevitably constrain such investments, compromising the scientific record and weakening public confidence in science.

* **There is a significant gap between the proposed caps and actual costs**.
First, a note on the DOAJ data set that the NIH has used for this proposal. It includes journals from a wide range of subject areas, including the humanities and social sciences, which have completely different funding mechanisms and requirements, and international journals with different cost inputs. The assumptions made about APC levels may not be appropriate for the type of research NIH funds.

Independent research from the ScholCommLab found that a $2,000 cap would cover APCs for as few as 6% of papers reporting on NIH-funded research that were published in the first half of 2025. A $3,000 cap would cover as few as 21% of papers. 10% of papers would not be able to be

published with a $6,000 cap.[5]

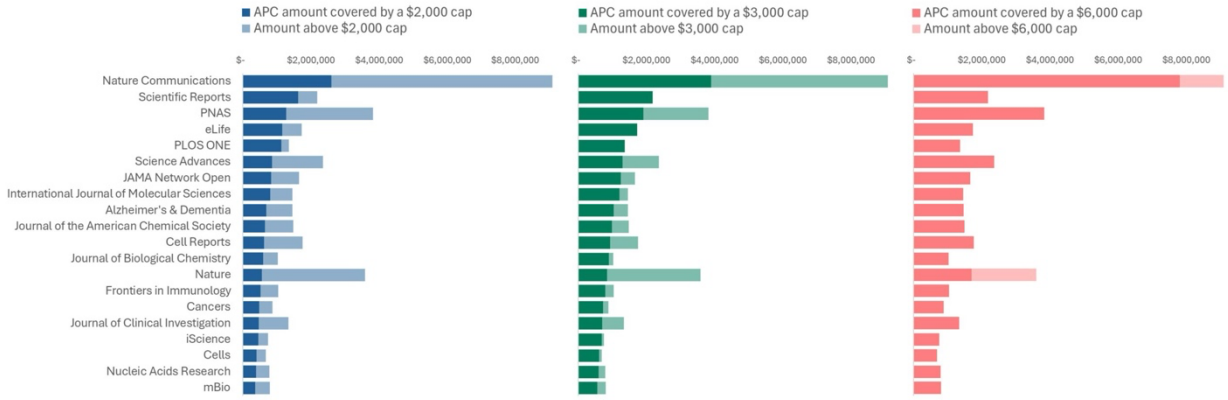


Figure 3: Top 20 journals by number of NIH-funded papers in 2025 and their associated APC income; the bars show how APC spending would be affected by each NIH scenario: $2,000 cap (left, blue), $3,000 cap (middle, green), $6,000 cap (right, red).

Frontiers conducted its own survey of APC data across the market in 2025, collating data on list price APCs for the 10 largest publishers for gold and hybrid journals. This analysis demonstrates that the majority of journals listed in the *Biology and Biochemistry* and *Clinical Medicine* Web of Science portfolios have list price APCs greater than the $3,000 cap and only a tiny fraction of the articles published in 2024 would have been covered by the proposed funding.

Put otherwise, there are virtually no high-quality journals in this subject category where NIH-funded authors can publish at this price point.

* **Gap between actual costs and the proposed APC caps carries significant risks to drive more market concentration**. Large publishers may be able to take advantage of their incumbent position to further gain market dominance and raise entry barrier for innovative publishers. This would further concentrate power among incumbents with scale advantages, raising barriers for innovative publishers like Frontiers and for society publishers.

Q3. Factors that NIH should consider in determining whether peer reviewers are appropriately compensated;

The idea of paying peer reviewers has been actively debated for many years.[6] While we at Frontiers have experimented with reward and incentive schemas — such as APC discounts,[7] Publons credits, and recognition through transparent peer review — we do not support direct payment.

Our position rests on several considerations:

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[5] Scholarly Communications Lab. "NIH to Cap Article Processing Charges (APCs) for Grantees." September 3, 2025. https://www.scholcommlab.ca/2025/09/03/nih-apc-caps/.

[6] Tim Vines and Alison Mudditt, "What's Wrong with Paying for Peer Review?," The Scholarly Kitchen, June 16, 2021, https://scholarlykitchen.sspnet.org/2021/06/16/whats-wrong-with-paying-for-peer-review/.

[7] New Community Focused Recognition Program for Frontiers. Accessed Sept 15, 2025. https://www.frontiersin.org/news/2023/12/06/new-community-focused-recognition-program-for-frontiers

- **Peer review as service.** Peer review is a professional responsibility that benefits all researchers in turn. It is widely recognized as part of the service component of tenure and promotion. Turning it into a financial transaction will undermine that reciprocity, eroding intrinsic motivation, and creating perverse incentives. Reviewers may prioritize volume over quality, or accept reviews despite conflicts of interest, simply to maximize earnings, not to mention that direct financial incentives will attract bad actors, compromising research integrity.
- **Motivation and recognition.** Most reviewers are motivated by intellectual engagement, the advancement of their field, and professional contribution — not by financial reward. There are more meaningful ways to provide recognition, such as publishing reviews transparently, acknowledging reviewer contributions, or granting formal credits, without reducing peer review to a paid service.
- **Financial feasibility.** With millions of papers submitted annually worldwide, compensating reviewers would be prohibitively expensive for most publishers.
- **Administrative burden.** A compensation system would require complex new processes for accounting, taxation, and compliance. It would add bureaucracy for both publishers and researchers, distracting from the core mission of advancing science. Enforcing such a system would be difficult, and its costs would outweigh potential benefits.

Compensating reviewers would introduce new financial and operational challenges while weakening the reciprocity and integrity that underpin peer review. Instead, NIH should encourage practices that recognize and reward reviewers in meaningful, non-financial ways, thereby sustaining the transparency, rigor, and impact central to Gold Standard Science.

Q4: In addition to compensating peer reviewers, other kinds of publishing best practices that NIH should consider as factors in determining the potential allowability of a higher per publication cost, such as use of automated fraud detection capabilities;

We applaud the NIH for contemplating ways to improve scholarly communications. The way to accomplish such improvement is not by reducing investment but by demanding higher quality standards and best practices.

We urge NIH to emphasize broad principles over prescriptive checklists of publishing practices. Creating and auditing a detailed list of criteria to determine different levels of funding would add bureaucracy, distract researchers from discovery, publishers from investing in meaningful initiatives to drive these goals, and require continual updates as standards evolve. A principles-based approach would provide the needed flexibility, reduce administrative burden, and still advance NIH's goals of transparency, rigor, and impact.

Here, we believe that in order to drive Gold Standard Science – research that is reproducible, rigorous, transparent, and impactful – the NIH should take a broad view of publishing best practices beyond compensating peer reviewers. The goal must be to ensure that every dollar of taxpayer investment advances public trust in science, strengthens reproducibility, and accelerates innovation. Below we list some recommendations:

*** Mandate Gold Open Access.** The public funding of science must deliver the greatest possible

return on investment and economic benefits. Gold Open Access ensures immediate, barrier-free discoverability, supported by FAIR standards of findability, accessibility, interoperability, and reuse. Articles published under Gold OA unlock collaboration at scale, in line with the Executive Order's call for open and transparent science.

*** Mandate, incentivize, and fund open data.** Data is an increasingly valuable research output in the age of computational methods and artificial intelligence. Articles and their underlying data should be treated as a single research package. Policies should support compliance with data mandates while also providing education, infrastructure, and funding to sustain data sharing. This is a chance to work with publishers and service providers to develop robust data products that expand reproducibility and trust, as new technologies enable us to find new insights.

* **Reward research integrity practices and tools.** The Executive Order underscores the need to restore trust in science by combating misconduct such as fabrication, falsification, and plagiarism. Automated integrity checks, like fraud detection technology backed by a team of research integrity experts, represent substantial investment and should be recognized as essential infrastructure. Verification of author identity, disclosure of funding sources and conflicts of interest, clear peer review policies, ethical oversight, and data validation systems are equally critical. These practices, though resource-intensive, uphold the transparency and rigor that define Gold Standard Science.

*** Exercise caution in treating preprints as final outputs.** Preprints are valuable for rapid dissemination but lack the essential validation that peer review provides. Disclaimers such as "not peer reviewed" are insufficient safeguards, particularly in an era of automated content analysis.

These examples are the kinds of principles that would deliver on NIH's commitment to make federally funded science transparent, reliable, and impactful. By embedding open access, open data, peer review integrity, and robust safeguards against misconduct into its funding model, NIH can ensure that American science leads the world not only in discovery, but also in trustworthiness.

Question 5: Other evidence or information not considered here that NIH should consider in its policy on limiting allowable publication costs.

* **There are cost-effective models that maximize the value of taxpayer-funded publication costs without unintended consequences**. Institutional and consortium-level models offer an effective mechanism to manage publishing costs and gain savings in research-intensive communities. At Frontiers, we have developed flat-fee agreements[8] under which a single payment covers a defined period and enables affiliated researchers to publish without limit. These models are adaptable to institutional administrative and budgetary requirements, while also preserving researcher choice in selecting their publishing outlet. We urge the NIH to explore the possibility of developing such partnerships to maximize the value of taxpayer investment in federally funded research.

* **Using publication funding strategically**. We recommend that NIH require a defined share of

[8] Fully Open Access Agreements at Frontiers. Accessed Sept 15, 2025. https://www.frontiersin.org/open-access-agreements/flat-fee-for-researchers

grant funds allocated for publication, data management, or Open Science practices to be used for those designated purposes. This would ensure that NIH's support for access is directed to its intended strategic goals, secure long-term availability of NIH-funded research, and reduce friction across the broader research ecosystem. In doing so, NIH would further its priorities of transparency, equity, and impact by ensuring that open science practices are consistently funded and sustained.

Best-practice publishing — safeguarding the scientific record, ensuring integrity, and making research widely available to American businesses and taxpayers — requires specialized expertise and sustained investment. These functions come at a cost, and they are essential to the long-term health of the research publishing ecosystem. Limiting APC support is going to slow the transition to Open Access, with long-term implications for American science. Funders and publishers must continue to work in partnership as stewards of science, so that taxpayer investment advances NIH's mission of transparency, rigor, and impact, while strengthening public trust in science and the institutions that support it.