

AAAS Response to RFI on the NIH Plan to Enhance Public Access to the Results of NIH-Supported Research

The American Association for the Advancement of Science (AAAS) welcomes the NIH's efforts to enhance public access, in line with the recent OSTP guidance aimed at making federally funded research publications and supporting data publicly available. Open and accessible data are essential to scientific integrity and reproducibility.

AAAS, a multi-disciplinary non-profit association of over 100,000 scientists at all levels of the scientific enterprise, publishes the *Science* family of journals. Our mission is to advance science and innovation throughout the world for the benefit of all.

The Science family of journals is open to the public without embargo using green open access models for five of our journals and a gold open access model for one.

Our journals require published authors to make their data immediately accessible in approved repositories and authors may share their author accepted manuscripts immediately upon publication.

AAAS applauds the NIH for emphasizing equity in its approach to public access policy development and for considering how to balance access to published work with the ability to publish, as well as the unintended consequences that focusing primarily on accelerating access for readers may have. AAAS is committed to collaborating with NIH, other federal research agencies, and OSTP to develop public access policies and supportive publishing models that achieve this balance and is pleased to offer its response to the NIH's RFI in this document. Responses to NIH's four key questions follow, with additional comments on data sharing considerations.

Question 1: How to best ensure equity in publication opportunities for NIH-supported investigators.

***Prompt:** The NIH Public Access Plan aims to maintain the existing broad discretion for researchers and authors to choose how and where to publish their results. Consistent with current practice, the NIH Public Access Plan allows the submission of final published articles to PubMed Central (PMC) (in cases where*

a formal agreement is in place) to minimize the compliance burden on NIH-supported researchers and also maintains the flexibility of NIH-supported researchers to submit the final peer-reviewed manuscript. NIH seeks information on additional steps it might consider taking to ensure that proposed changes to implementation of the NIH Public Access Policy do not create new inequities in publishing opportunities or reinforce existing ones.

AAAS Response:

AAAS applauds the NIH for the leadership it has assumed in emphasizing equity as a key consideration in public access policy development. Through experimentation and analysis, AAAS has found that vast differences exist in how different open access models impact the ability and equity of opportunity for scientists aiming to publish their work for wide dissemination.

Some models of open access lock in place and exacerbate existing inequities in the scientific enterprise. Finding the right balance between enabling access to published work and publishing opportunity will be crucial as NIH and other federal agencies move forward with revision of their public access policies. AAAS further wishes to express support for NIH's plan to allow for submission of "the final peer-reviewed manuscript to the NIHMS System at the time of acceptance for publication in a journal" as a means of complying with the Public Access Policy. Allowing for submission of this version of the manuscript is critical to mitigate issues associated with author- and institution-borne costs for publishing open access, including article processing charges (APCs).

To strengthen its policy as relates to equity, AAAS recommends that NIH explicitly define and recognize the "author accepted manuscript" as the version that should be submitted to the NIHMS system, to create public access. This would directly address growing challenges that alternative public access models – for which authors pay to make their work open – create for early-career scientists, scientists at smaller schools, and scientists in underfunded disciplines, among others. It would help to ensure a diverse universe of scientists can publish important work, regardless of their economic circumstances.

This step would also require the agency to more directly consider the role of business models – some of which do not foster inclusivity – in its efforts around public access. While NIH's Plan for Scholarly Publications does not address business models other than to state that "NIH does not propose requiring authors to publish in any particular type of journal or journal with any specific type of business model (e.g., subscription model, open access model)," it is essential to recognize that if journal policies do not allow for deposition of the author-accepted manuscript in the NIHMS system at the time of publication, this policy

will limit authors' publishing options – driving scientists to publish in open access journals to which they must pay an APC (fees for which only stand to increase as the publishing market consolidates) or in journals with which their institution has a transformative agreement. This may temporarily work well for senior scientists who are (routinely) well-funded, tenured, and overwhelmingly male and white, but it will freeze in place and exacerbate inequities for many others, including a new generation of scientists. By channeling researchers to a limited number of commercial publishers, it will also drive further consolidation in a market that is already heavily concentrated, and where APC fees will only increase with time. The resultant heavy cost burden will be borne not only by researchers and their institutions, including at a time when institutional research budgets are increasingly challenged, but by funders of research (including taxpayers). We urge the agency to proactively communicate with publishers about their policies to ensure they allow authors to deposit the AAM in the NIHMS system. This is essential to ensuring that, regardless of a scientist's geographic location, institutional affiliation, academic rank, or identity, they can publish world-changing science.

Finally, as addressed in the response to the third question within this RFI, AAAS also believes that monitoring implementation of changes to the public access policy and publishing costs paid by researchers and institutions will be critical to ensuring that these changes do not create new inequities or reinforce existing ones. It may be valuable for NIH to conduct a survey, as AAAS did on a smaller scale in 2022 (<https://www.aaas.org/news/aaas-survey-many-researchers-face-difficulties-paying-open-access-fees>), and/or develop a public reporting scheme about scientist-borne publishing-associated costs and related tradeoffs.

Question 2: Steps for improving equity in access and accessibility of publications.

***Prompt:** Removal of the currently allowable 12-month embargo period for NIH-supported publications will improve access to these research products for all. As noted in the NIH Public Access Plan, NIH also plans to continue making articles available in human and machine-readable forms to support automated text processing. NIH will also seek ways to improve the accessibility of publications via assistive devices. NIH welcomes input on other steps that could be taken to improve equity in access to publications by diverse communities of users, including researchers, clinicians and public health officials, students and educators, and other members of the public.*

AAAS Response:

AAAS supports open-research initiatives, including text and data mining, that use technology to meet the needs of researchers. However, appropriate limitations are important to ensure such offerings remain sustainable; we have seen some initiatives lead to unintended consequences when the necessary rights have not been secured to enable their sustainability. Given the fast pace of artificial intelligence development, it is critically important to monitor the creation and adoption of guidelines for tools that can be trained on full text journal articles, including for the purposes of replicating scholarly journal content, to ensure a focus on responsible and ethical development.

Science journal articles, and specifically the author accepted manuscript (AAM) versions of such articles, may be used for text and data mining by individuals and by nonprofit, noncommercial subscribing institutions. Sustainably increasing accessibility to publications via this route requires that publisher reuse policies are followed by federally funded researchers. AAAS encourages NIH to consider how adherence to related policies will be monitored and what administrative burdens this might create for researchers, institutions, and the agency. NIH should also endeavor to monitor how changes resulting from the open access policy, including a breadth of open license types, might facilitate and incentivize reuse that adversely impacts the integrity and accuracy of the downstream communication of research published by federally funded researchers.

Regarding other avenues by which to improve accessibility to publications, including for people with disabilities, NIH may wish to consider implementing guidelines around adherence to the Web Content Accessibility Guidelines, with a concerted focus on making text and data available.

Question 3: Methods for monitoring evolving costs and impacts on affected communities.

***Prompt:** NIH proposes to actively monitor trends in publication fees and policies to ensure that they remain reasonable and equitable. NIH seeks information on effective approaches for monitoring trends in publication fees and equity in publication opportunities.*

AAAS Response:

Careful and continued study of publication fees and policies will be essential for understanding the near- and long-term effects of changes in public access policies. Study of costs effects at the researcher, institution, and enterprise levels is needed. Adaptation of federal grant agreements to require reporting on the

payment of publication fees and reliance on transformative agreements (in instances where authors avoid payment of a fee because their institution has a transformative agreement with their journal of choice) represents one logical approach to monitoring fees. AAAS also encourages NIH to consider a study or studies that engage institutional leadership to estimate and report on publishing costs across institutions.

In addition to developing methods for monitoring costs, AAAS encourages NIH to develop and adopt a public reporting scheme to ensure visibility and transparency into publishing costs borne by scientists, their institutions, and ultimately the NIH. This will allow for future course correction.

All analysis of and reporting on publication costs should examine potential variability in costs across disciplines, career stages, and institution type, as well as based on researchers' backgrounds and characteristics. Analysis and reporting should assess if and how changes in the Public Access Policy may affect the volume of research publications authored by scientists who are early career or are from smaller, lesser-funded, and historically underrepresented institutions, including Historically Black Colleges and Universities; Hispanic-Serving Institutions, EPSCoR, and other Minority-Serving institutions; where researchers choose to publish; and potential variability in effects across different research disciplines including, but not limited to, the life sciences, physical sciences, social sciences, humanities, mathematics, and engineering.

Question 4: Early input on considerations to increase findability and transparency of research.

Prompt: *Section IV of the NIH Public Access Plan is a first step in developing the NIH's updated plan for persistent identifiers (PIDs) and metadata, which will be submitted to OSTP by December 31, 2024. NIH seeks suggestions on any specific issues that should be considered in efforts to improve use of PIDs and metadata, including information about experiences institutions and researchers have had with adoption of different identifiers.*

AAAS Response:

Access and transparency are foremost considerations at AAAS, where our mission includes communicating science accurately, broadly, and in such a way to ensure the scientific community can reanalyze and reproduce new works. In recognition, AAAS supports the final peer-reviewed author-accepted version of a paper being broadly and immediately shared and the flexibility afforded by NIH's intention to accept the final peer-reviewed version of the article as a means of complying with its updated public access policy. At AAAS, however, we believe

that publisher oversight of a final version (the version of record, or VOR) is essential not only to maintaining the quality and accuracy of scientific research but also to advancing the subsequent work from which new research stems. Only the final version of a manuscript overseen by a publisher committed to maintaining the accuracy of the scientific record can be counted on to be corrected, retracted or otherwise updated with clear notation for the global scientific research community. Ensuring that publication repositories clearly distinguish between multiple versions of articles (i.e., ensuring that singular publication records point to the VoR, where the AAM is deposited first) will be critical, as NIH moves forward. The NIH may wish to implement guidelines requiring that authors depositing their AAMs provide a DOI (digital object identifier) pointing to the VOR. Indeed, at AAAS, our instructions for authors depositing AAMs require them to include a link to the VOR.

With respect to metadata, linkages between publishers and organizations such as the Research Organization Registry (ROR), Open Researcher and Contributor ID (ORCID), Crossref, and data repositories are aimed at increasing robustness of metadata by providing persistent identifiers and connecting them to research outputs. As a publisher, AAAS monitors and implements best practices for both metadata collection (e.g., on institutions and funders) and metadata propagation in the VOR and associated research objects.

All *Science* journal papers include details about funding, author contributions, competing interests, data and materials availability, and license information. The publisher oversees accuracy of important associated metadata after publication, including in cases where authors request to change their names in previously published papers, as one example. As a criterion to publish, AAAS requires authors to make their data publicly accessible. AAAS has also piloted a partnership with Dryad, an international open-access data repository; we encourage such partnerships because they help ensure that publishers and repositories share the same metadata, thus providing better linkage between the data and the research paper. NIH may wish to consider implementing guidelines for data availability in publications. These guidelines could include a clear set of criteria for data deposition and ease of linking to that data, which publishers could help enforce. As a best practice, NIH could also encourage connections between publishers and data repositories of various kinds (general or field-specific, or both).

Additional Comments Not Addressed in Responses to Question Above

With the ongoing shifts in public access policy, researchers and institutions will face new challenges for data management. These require fundamental research

infrastructure that is lacking. Database infrastructure oversight is resource-intensive, and in a way that is only increasing with time. The ability to protect data – even anonymized data – is also increasingly challenging in the age of sophisticated artificial intelligence tools. As more databases come online to meet the needs of various parts of the scientific community, it is crucially important that these databases follow best practices designed to ensure the data are maintained and protected to highest current standards.

AAAS is among publishers requiring that data supporting research papers be available at the time of publication, either in the manuscript or supplementary material or through a public repository. This may include nontrivial costs, as some repositories require payment for data archiving. These costs will only increase as the capacity for high-throughput research increases. At the *Science* journals, we found that questions around complying with our data policies arose mainly for datasets that lack a field-specific repository. To help support equity among authors, AAAS is piloting a partnership with Dryad, an international open-access general data repository, and covering costs for data publication for *Science* family journal authors.

However, covering data archiving costs is not viable on a larger scale. At AAAS, we can foresee the challenges in this space, even as efforts to ensure all data underlying new publications are available via repositories are, in many ways, at their earliest stages in the scientific publishing ecosystem. How to manage the cost for publishing in data repositories and for maintenance of data infrastructure – be it through grants or other means – is an important question. How this can be achieved while also ensuring the protection of data, especially sensitive data, is an equally pressing and resource-intensive consideration. As NIH updates its public access policy, therefore, AAAS encourages its leadership to consider these issues and how NIH will monitor and manage inequities in data deposition and sharing. Without a strategy at the federal level, data curation and access could become a focus of the private sector. A sophisticated data access strategy that best serves the research community may also need to consider tradeoffs in data deposition that ensure only the data most important to analyzing and replicating research is deposited, helping to reasonably manage data input streams.