

ACS Response to the National Aeronautics and Space Administration request for information (RFI) on NASA's *Public Access Plan, Increasing Access to the Results of Scientific Research*

The American Chemical Society (ACS) welcomes the opportunity to respond to the National Aeronautics and Space Administration (NASA) request for information (RFI) on *NASA's Public Access Plan, Increasing Access to the Results of Scientific Research*. ACS is a congressionally chartered non-for-profit organization and the world's largest scientific society with more than 173,000 individuals in our global membership community across 140 countries. ACS advances knowledge and research through scholarly publishing, scientific conferences, information resources for education and business, and professional development efforts.

Our response to the key questions identified in the RFI is as follows:

1. How can NASA best ensure equity in publication opportunities for NASA-supported investigators?

As a socially responsible organization deeply rooted in the scholarly community, we share NASA's goal to ensure equity in publication opportunities. The best way to achieve this goal is to ensure that all stakeholders in the process of transitioning to immediate open access, e.g., researchers, funders, and institutions, understand that every method of open access publication has a cost that must be funded and budgeted – and that competition and diversity in publication outlets is the best way to maximize the efficiency, and therefore the cost, of those outlets.

Researchers need specific guidance on planning for and budgeting any new requirements: including budgeting during the grant application process to account for anticipated publications costs. We suggest that NASA work with organizations like ACS to help develop budgeting guidance. Encouragement and education should be provided at the start of the grant process to make sure that appropriate planning takes place.

Of the different methods that can ensure equity at scale in publication opportunities, direct funder support for publishing, i.e., Gold Open Access (Gold OA), is the most financially sustainable. This is because researchers can be secure in the knowledge that they have the funds needed to support publication in the outlet of their choice and the outlets themselves have a reliable source of funding with which to continue their operations and ensure the integrity of the content published. Gold OA at the ACS, as with many other society publishers, is a dynamic and customizable option for researchers to enable immediate OA. We have a robust waiver and discount program that helps researchers from low- and middle-income countries to publish at highly discounted rates rising to a complete waiver for low-income countries.

Immediate access to an accepted manuscript version of an article, i.e., immediate Green OA, has not proven to work at scale, even if it may work for a very small number of publishers or disciplines. It often appears cost free to researchers and others, but in fact it is reliant on subscriptions to cover the cost of peer review and publication. A widespread use of this method, in conjunction with tools such as Unsub.org that explicitly encourages institutions to cancel subscriptions where alternative free versions of articles are accessible, threatens the viability of

the subscription funding on which Green OA methods of providing public access rely. The loss of subscription funding in this context, means depleted resources available for publications to ensure the quality and integrity of the scientific record. This will directly result in erosion of public trust in science and a dampening effect on innovation, job growth, and scientific progress. It will also increase the likelihood that important publication outlets will cease operations due to lack of funds, creating new barriers to access and equity in publication opportunities. Smaller and not-for-profit publishers, including those associated with learned societies, are most likely to be at risk from this practice that could easily result in increased market consolidation. This, in turn, is likely to reduce author choice and market competition, stifling innovation and undermining equity in publication opportunities.

We recommend that NASA avoid creating these barriers, especially for scientists from traditionally marginalized communities, as well as early career researchers, by ensuring that all its grantees have the funding support necessary to enable their research and choose the publishing option that best suits their needs.

We encourage NASA to read and reference the [position statements](#) by STM on this subject, representing much of the publishing industry.

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

NASA can improve equity in access and accessibility of publications by helping to educate researchers that the publication cost of immediate open access is as much a part of the dissemination of research reports as attendance at scientific conferences and gatherings. They can achieve this by ensuring that adequate funds are available to researchers to enable them to support immediate open access and by advocating for the long-term funding support from Congress needed to enable equity in access and accessibility. NASA is also encouraged to initiate public-private partnerships with organizations like ACS that provide discovery tools widely used by scientists globally to seamlessly identify research reports, data, and analyses that fuel innovation, economic prosperity, and scientific progress.

Of the different methods designed to achieve equity at scale in access, Gold OA has the greatest chance of success. Gold Open Access at the ACS, as with many other society publishers, is a dynamic and customizable option for researchers to enable immediate OA. We have a robust waiver and discount program that helps researchers from low- and middle-income countries to publish at highly discounted rates rising to a complete waiver for low-income countries. Gold OA is a powerful model for enabling universal access to the most authoritative publications reporting on the results of scientific research, the Version of Record (VoR). The VoR is the authoritative version for researchers and the public, and is more cited and used, and garners more attention and trust than other versions. It can link bi-directionally to research objects like data and code, is continually updated, and is hosted on the publisher's platform where it can be integrated with other relevant content and analytical tools.

We are aware of NASA's desire to be business model agnostic and therefore caution against the promotion of immediate access to accepted manuscript versions of an article, i.e., immediate Green OA, especially through the so-called "rights retention strategy" (RRS). Immediate Green

OA has not proven to work at scale, even if it may work for a very small number of publishers or disciplines. It often appears cost free to researchers and others, but in fact it is reliant on subscriptions to cover the cost of peer review and publication. A widespread use of this method, in conjunction with tools such as Unsub.org that explicitly encourages institutions to cancel subscriptions where alternative free versions of articles are accessible, threatens the viability of the subscription funding on which Green OA methods of providing public access rely. The loss of subscription funding in this context, means depleted resources available for publications to ensure the quality and integrity of the scientific record. This will directly result in erosion of public trust in science and a dampening effect on innovation, job growth, and scientific progress. It will also increase the likelihood that important publication outlets will cease operations due to lack of funds, creating new barriers to access and equity in publication opportunities. Smaller and not-for-profit publishers, including those associated with learned societies, are most likely to be at risk from this practice that could easily result in increased market consolidation. This, in turn, is likely to reduce author choice and market competition, stifling innovation and undermining equity in publication opportunities.

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Immediate Green OA also contributes to version-control issues and potential confusion because, although there can be important and even critical differences in the text, an accepted manuscript and a VoR can look the same in their raw versions – implying trust when this could be misplaced. It risks slowing the move towards full open access because it is not a publishing model in itself but is primarily supported via subscriptions which leave the most valuable version of an article, the VoR, subject to access controls. Finally, the “rights retention strategy” approach to immediate Green OA restricts rather than expands a scientist’s ability to choose how best to maximize the benefits of their work. For these reasons, immediate Green OA cannot deliver on the promise of an easily accessible, navigable, and interconnected Open Research ecosystem.

ACS instead recommends that researchers be allowed to publish under rights consistent with their vision and needs, including non-commercial, non-derivative licenses. We support access methods that are most consistent with academic freedom of expression globally based upon the responsible exercise of independent editorial control.

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

In our answer to question one, we addressed how NASA can best ensure equity in publication opportunities. Here we will respond to the question of monitoring publication fees. The simplest and most effective way for NASA to keep itself informed about publication fees is to partner with publishers and organizations like ACS whose fees are publicly posted on their websites. This practice would not only ensure transparency around costs, but also enable NASA to confirm that grantees are paying a fair market price for the services and value provided. We note that cost structures are very different for different organizations – medicine, physical sciences, social

sciences, and humanities – and for different types of journals based on selectivity, services, technology, and other features. A diverse, financially sustainable, and robust publishing system which provides authors with broad choice is the most effective way to control cost. We caution against inflexible cost caps which will likely drive existing industry trends toward publisher consolidation and volume-based models which compromise integrity, quality, and author choice.

One constant, regardless of the field of research endeavor, is that rigorous publications are essential to support scientific communication and public trust in science. Researchers and policy makers must be able to rely on the integrity of the scientific publications that inform their decisions. The public, in turn, must be able to feel confident that practitioners' and policymakers' scientific and technical decisions are grounded in accurate information. Organizations like ACS are deeply committed to supporting integrity and trust in science by building and maintaining infrastructure that enables the widespread production and communication of validated and reliable reports on scientific research. Among other things, this involves creating scientific journals and staffing their editorial boards with experts that read and evaluate thousands of submitted manuscripts for quality and relevance. ACS also spends significant resources to ensure the integrity of journal articles by verifying author and content integrity, assessing articles for ethical considerations, managing and underscoring authors' potential conflicts of interest, and conducting plagiarism, ghost and gift authorship checks to combat paper mills, image manipulation, and the use of artificial intelligence tools like ChatGPT in inappropriate ways.

Our investments in support of scientific communication do not end when a peer reviewed article is published. We update articles for correction and addenda, update links, and conduct ongoing plagiarism and copyright protection to safeguard the integrity of the work and ensure articles are not modified or pirated in misleading and harmful ways. Upholding the version of record and providing the clarity necessary to easily distinguish between the version of record and earlier, less reliable versions of an article, is a key principle of scientific integrity. In order to build trust in science, readers must be able to easily identify and discover trusted peer reviewed content. To facilitate this process, we assign digital identifiers, provide metadata, conduct search engine optimization, track citations and other important metrics, and submit articles to abstracting, indexing, and discovery services. These valuable services support scientific integrity by pointing readers to the highest quality scientific publications and data.

At a time when concerns around misinformation — including on critical issues of science and medicine — have become a national priority, there is an urgent need for stakeholders that support scientific integrity to work together and uphold the role of objective, trusted information in a democratic society. Therefore, it is essential that federal policies related to publications ensure that scientists and publishers can continue producing and disseminating the trusted, peer reviewed, VoR of scientific articles by providing sufficient funding for researchers who choose to publish OA to support investments in publishing their works in high-quality journals that uphold scientific integrity.