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Dear Office of Science and Technology Policy:

The American Physiological Society (APS) is pleased to respond to the Office of Science and Technology Policy's December 9, 2009 request for public comments on Public Access Policies for Science and Technology Funding Agencies Across the Federal Government.

The APS supports the principle of providing the public with access to the findings of federally-funded scientific scholarship. Indeed, journals published by scholarly societies have been leaders in moving their content online and developing mechanisms to make that content readily and freely accessible to the scientific community and to the public. Nevertheless, we believe that releasing peer-reviewed research articles in competition with scholarly publishers is the wrong approach because it will undermine the ability of publishers to serve as filters and guardians of the scientific record.

One of President Obama's first actions was to issue a Memorandum on Transparency and Open Government on January 21, 2009. This document set forth three principles: transparency, participation, and collaboration as the cornerstone of an open government. It is worth noting that the third principle, collaboration, argues against causing economic or other damage to private institutions.

The APS believes that OSTP should keep the following in mind as it considers how to provide the public with access to the findings of federally-funded scientific scholarship.

- **The Government should establish appropriate materials and channels for information exchange with the public about agency funding expenditures.**

The principle of transparency denoted in President Obama's memorandum requires the Government to provide the public with information about how public funds are spent through contracts, grants and cooperative agreements. Appropriating the scholarly record (i.e., the published manuscript) or a version of it is a back-door way of doing so. Most funding agencies already maintain databases listing the names of award recipients and titles of their proposals and many agencies already receive lay

summaries of projects for distribution to the public. Investigators can be directed by funding agencies to submit lay summaries with their annual progress reports. Both the database and summaries should be provided to the public. The government needs to be clear about who is the 'public,' the lay public who would benefit from purpose-written summaries relating to publicly funded research; the scientific public, who currently has access to the literature; the global public, whose tax dollars are not involved but who benefit hugely. Publishing information on the projects funded by Federal agencies as suggested above will further enhance the ability of the public to have an informed dialog with the Government on how its tax dollars are being spent.

- **The government and scholarly publishers share the goal of disseminating scientific findings and should collaborate to achieve it.**

The President's Memorandum on Transparency and Open Government states that "collaboration improves the effectiveness of Government by encouraging partnerships and cooperation within the Federal Government, across levels of government, and between Government and private institutions." The government should seek genuinely collaborative solutions to the challenge of enhancing access to research findings.

- **Scholarly publishers provide the essential services that ensure the quality of journal content**

It is clear from the Federal Register Request that the Administration is familiar with the roles played by scientific publishers. Publishers facilitate the validation and dissemination of scientific information. In addition to the risk taken in developing new publications in support of new areas of research, publishers provide the unique service of managing the scientific record through filtering and validation of the manuscripts by means of peer review.

The majority of manuscripts submitted to a given scientific journal do not make it through to publication because of scientific shortcomings (identified during peer review) that undermines their reliability. Moreover, the majority of those that are ultimately published will first undergo revisions as a result of the peer review process. This means that publishers must organize and coordinate the review of far more manuscripts than they will ever publish. The review process offers the additional benefit of providing valuable feedback to scientists whether their manuscripts are rejected or accepted. By filtering and validating content for its scientific quality and ethical integrity, publishers serve as globally recognized gatekeepers of the scientific record.

- **The current NIH Public Access Policy undermines journals and confuses the scientific record**

The National Institutes of Health has relied upon the authoritative validation provided by scholarly publishers in establishing its PubMed Central (PMC) repository of full-text articles. The NIH mandate is for the upload of manuscripts *after* peer review had been completed and the manuscript had been accepted for publication. This practice jeopardizes the economic viability of the journals on which the NIH depends because it puts the government in the position of competing with private publishers. Once the embargo is lifted, public access to the published article in PMC siphons usage away from journals. Usage is a metric by which research libraries and other sectors of the scholarly

community assess the value of articles and the need for journal subscriptions. Because PMC has refused to disclose article usage data to journal publishers, it is impossible to determine the extent to which journal usage is being undermined by PMC.

The other problem with a government collection of manuscripts is that it results in multiple versions of the article. Accepted manuscripts typically go through editorial revision so providing access to such manuscripts may confuse readers and, in some cases, corrupt the scientific record.

- **There is a tension between “free” and “expensive” when it comes to high quality information**

As journals moved online in the mid-1990s, Open Access advocates began calling for free and immediate access to the scientific literature. One half of a seminal statement attributed to Stewart Brand from a 1984 Hacker’s conference (<http://www.rogerclarke.com/II/IWtbF.html>) is frequently quoted by the OA movement: “*Information wants to be free - because it is now so easy to copy and distribute casually.*” But Brand also said that “*information wants to be expensive - because in an Information Age, nothing is so valuable as the right information at the right time.*” There are costs associated with not only identifying high quality information but also rendering it accessible and discoverable. Scholarly publishers have invested in the cost of the creation of electronic platforms for the submission and review of manuscripts, electronic hosting of the content, along with robust tagging of the metadata, and specialty taxonomies for data-mining.

If the government decides there is a compelling need to provide public access to peer reviewed research articles, it must also be prepared to replace lost subscription revenues with article processing fees so that journals can continue to provide peer review and ensure the integrity of the scientific record.

APS responses to questions raised in OSTP Federal Register Notice

1. *How do authors, primary and secondary publishers, libraries, universities, and the federal government contribute to the development and dissemination of peer reviewed papers arising from federal funds now, and how might this change under a public access policy?*

Scholarly journals play a critical role in managing the scientific record by coordinating the peer review process, which serves as a filter and quality control mechanism. Each submitted manuscript is subject to the same procedures, even though many are ultimately rejected. Publishers such as the APS that are serious about their responsibility as gatekeepers for the scientific record also seek to identify and screen out research that fails to observe appropriate ethical standards for human and animal research as well as scientific integrity. In addition to establishing standards of excellence respected by readers around the globe, peer review also provides valuable criticism that enables authors to refine their work. Publishers provide a number of essential services, ranging from editorial processes that facilitate communication through enhanced readability to the actual dissemination of scientific information. With respect to the latter, publishers take entrepreneurial risks by developing new publications that recognize and advance important new areas of research and by exploring new platforms for the dissemination of research.

Prior to 1995, “public access” involved going to the library. Expectations of access changed rapidly once journals developed electronic publishing platforms. The concern today is how to maintain high standards of journal quality. Any move towards public access to the peer reviewed literature must be accompanied by provisions that enable publishers to recover the costs to produce the peer-reviewed literature.

2. *What characteristics of a public access policy would best accommodate the needs and interests of authors, primary and secondary publishers, libraries, universities, the federal government, users of scientific literature, and the public?*

Any government public access policy must preserve the viability of peer review and ensure the integrity of the scientific record. Various journals currently use different strategies to recover the costs of these operations: Some charge subscription or access fees to readers; some charge article processing fees to authors; some are subsidized by a scholarly society, research institution, funding agency or commercial interest; and many utilize a hybrid model combining various funding streams. Even without a government mandate, many not-for-profit publishers already provide free access to their journals either immediately upon publication or after some interval. The specifics of the access policy vary according to how the journal recovers costs and the nature of journal usage in a given scientific discipline. The NIH Public Access Policy took into account the notion that one size does not fit all. The government should avoid crafting access policies or mandates that undermine the ability of publishers to continue to recover costs as they currently do unless the government also provides funding to ensure that journals can continue to provide high quality peer review and related services.

3. *Who are the users of peer-reviewed publications arising from federal research? How do they access and use these papers now, and how might they if these papers were more accessible? Would others use these papers if they were more accessible, and for what purpose?*

The APS publishes journals of physiological research, much of which is basic research. The primary audience for basic research is other scientists engaged in similar work. Such research can only be undertaken in institutions that have extensive infrastructure, including laboratory facilities and regulatory compliance offices. Such institutions typically have reference libraries that maintain subscriptions to the relevant scientific literature, including our journals. Researchers typically locate articles online with various search engines such as Google, Google Scholar or PubMed. They can access these articles seamlessly from their own computers thanks to the institution’s subscription to the journal.

The APS is not aware of any significant unmet demand for access to basic research in physiology. APS published nearly 3,900 articles in 2009 yet receives only 3-4 requests per week from patients or their doctors seeking information about their conditions. The APS gladly provides them with complimentary access to articles with a bearing upon their conditions.

4. *How best could federal agencies enhance public access to the peer-reviewed papers that arise from their research funds? What measures could agencies use to gauge whether there is increased return on federal investment gained by expanded access?*

The best way to facilitate public access to the peer-reviewed literature is for the government to work cooperatively with publishers. That will mean crafting policies that take into account differences in how journals recover their costs and how scientists in various fields utilize the literature. If the government determines that there is a compelling need to provide access before it is economically feasible for publishers to do so, then it must be prepared to provide the funds needed to support the peer-review and related processes that it deems so valuable.

In measuring whether there is an increased return on federal investment, the government must include whatever costs are entailed by establishing information storage and retrieval systems that duplicate those of the private sector. In addition, it should measure the effect on U.S. trade when research institutions and pharmaceutical companies in other countries cancel their journal subscriptions in favor of free access to scholarly articles through U.S. government websites.

5. *What features does a public access policy need to have to ensure compliance?*

Optimal compliance will be achieved when there is a collaborative system that has the broad support from the government, scientific societies, publishers, and scientists themselves.

6. *What version of the paper should be made public under a public access policy (e.g., the author's peer-reviewed manuscript or the final published version)? What are the relative advantages and disadvantages to different versions of a scientific paper?*

The final published version is the article of record. However, making that article available from a government website places it in direct competition with the publisher. During the debate over what form NIH's public access policy should take, the APS and other scholarly societies recommended that NIH obviate this conflict by providing access to the final article on the journal website through a link beside the abstract in PubMed. Providing access to any other version than the final version would serve to confuse the scientific record. The issue of government competition undermining the economic viability of journals must be resolved in order for there to be a successful collaborative public access policy.

7. *At what point in time should peer-reviewed papers be made public via a public access policy relative to the date a publisher releases the final version? Are there empirical data to support an optimal length of time? Should the delay period be the same or vary for levels of access (e.g., final peer reviewed manuscript or final published article, access under fair use versus alternative license), for federal agencies and scientific disciplines?*

It is clear from our experience with the NIH Public Access Policy that "one size does not fit all." While the initial plan called for a 6-month embargo, discussions between society publishers and the NIH leadership resulted in a modification of the plan to allow for a 12-month embargo. The decision was made recognizing the important role journals play in the validation and dissemination of scientific information and that a shorter period might

jeopardize the ability of the journals to sustain the all important peer review process should subscription revenues diminish because content was available in 6 months.

Different fields of science have different patterns of usage and citation. From our experience, it is clear that there is no uniform optimal embargo period across all scientific disciplines. While a 12 month embargo might work reasonably well for most journals in the research areas funded by NIH, it is unlikely that the same can be said for research funded by NSF, NASA, USDA, USGS, etc.

Each field of research has its own particular “Cited Half-Life,” which provides an indicator as to the long-term value of source items in a single journal publication. Thomson Reuters defines the Cited Half-Life as “the number of years, going back from the current year, that account for 50% of the total citations received by the cited journal in the current year.” Some fields such as molecular/genomic research may have a short Cited Half-Life of 1-3 years while physiological research has a longer shelf life and therefore a longer Cited Half-Life of 7-10 years. For investigators working in the physiological sciences and other areas with longer Cited Half-Lives, rapid public access may compromise the viability of the journal because it will lead to cancellations.

If the government truly believes that peer review is important, it must find a way to sustain peer review either by establishing policies that do not undermine subscriptions or else by paying for peer review through article processing fees. The problem with the latter is that such funding will inevitably (a) reduce the amount of funding available to conduct research and (b) be subject to the vagaries of legislation.

8. *How should peer-reviewed papers arising from federal investment be made publicly available? In what format should the data be submitted in order to make it easy to search, find, and retrieve and to make it easy for others to link to it? Are there existing digital standards for archiving and interoperability to maximize public benefit? How are these anticipated to change?*

For anyone who has followed the development of the web and search engines, especially Google and Google Scholar, there is no need for the government to do anything “...to make it easy to search, find, and retrieve, and to make it easy for others to link to it.” Publishers are already working with Google and other search engines to allow crawling of content to enhance search and retrieval. Assuming the article carries proper attribution listing the government funding agency, Google can be used to manage research portfolios to determine which papers are funded by specific research grants or funding initiatives. All this has already been accomplished as a result of the XML tagging of manuscripts to facilitate display in an HTML format. Societies are investing in *robust tagging of the metadata for discoverability and specialty taxonomies for data-mining to accommodate current researcher needs*. Societies are already working to develop archival solutions for digital content, partnering with Portico and publisher- and library-supported initiatives such as CLOCKSS. It is clear that government funding of these archiving initiatives would speed the process.

9. *Access demands not only availability, but also meaningful usability. How can the federal government make its collections of peer-reviewed papers more useful to the American public? By what metrics (e.g., number of articles or visitors) should the Federal government measure success of its public access collections? What are the best examples of usability in the private sector (both domestic and international)? And, what makes them exceptional? Should those who access papers be given the opportunity to comment or provide feedback?*

Government agencies can provide the public with information about government-funded research through searchable databases of funded research projects with scientific abstracts and lay summaries. In some cases, this can be enhanced by releasing lay summaries of researchers' progress reports, and journal citations as set forth in the America Competes Act. Making this research more useful to the public requires an interpretive layer, and this is an area where federal investment could be useful. The NIH website MedLinePlus is a good example of a consumer-oriented government website.

Often the government funds basic research designed to advance our understanding of physical, chemical, social or biological processes, and the audience consists of other scientists rather than the public at large. NIH has developed a number of linkages between the PMC manuscript collection and its various databases of chemical structures and genetic information, etc. A public access program could provide similar enrichments to other government funded literature, but that would exclude the majority of scientific research. An alternative approach would be for the government to develop software that publishers could use to tag and link all of their articles to government databases.

In terms of providing expanded access to this science, it is preferable for the federal government to work with the journal publishers so that the citations arising from research grants can be accessed through links provided from Progress Reports.

The APS appreciates the opportunity to submit these comments.

The APS is a not-for-profit scholarly association founded in 1887 to promote the advancement of physiology. Today the APS has nearly 11,000 members who are scientists involved in physiological research and the teaching of physiology at colleges, universities, and medical schools and in industry, government, and independent research institutions. The APS publishes peer reviewed journals, sponsors scientific meetings and conferences, and provides professional development opportunities for its members as well as educational and mentoring programs to identify, encourage, and train future physiologists. For its efforts in the latter areas, the APS was awarded the 2003 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.

The APS publishes 14 journals that provide venues where research findings are validated through peer review and disseminated to other scientists. In 2009, 7,393 manuscripts were submitted to the APS journals peer review system, and 3,882 manuscripts were ultimately published. The oldest APS journal is the *American Journal of Physiology*, founded in 1898, and its newest journal is *Physiological Genomics*, founded in 1999. The Society regards itself as responsible for the integrity and accessibility of the research it publishes. Since 1996, the Society has published both print and online versions of its journals.

The journals of the APS include:

- *American Journal of Physiology (AJP)* was founded in 1898. Since 1977, the *AJP* has been published in both a consolidated edition and as the following individual journals addressing these focused research areas:
 - *AJP-Cell Physiology*
 - *AJP-Heart and Circulatory Physiology*
 - *AJP-Regulatory, Integrative and Comparative Physiology*
 - *AJP-Renal Physiology*
 - *AJP-Endocrinology and Metabolism*
 - *AJP-Gastrointestinal and Liver Physiology*
 - *AJP-Lung Cellular and Molecular Physiology*
- *Physiological Reviews* (Founded 1921)
 - *Journal of Neurophysiology* (Founded 1938)
- *Journal of Applied Physiology* (Founded 1948)
 - *Physiology* (Founded 1986)
 - *Advances in Physiology Education* (Founded 1989)
 - *Physiological Genomics* (Founded 1999)

The APS supports public access to the scholarly literature. In 2000, the APS made online access to the content of its journals freely available 12 months after publication. In 2002, the APS initiated free online access to its journals for its 10,500 Society members. In 2004, the APS scanned and rendered searchable all journals published between 1898 and 1996, which is provided free to members. The APS provides free journal access to scientists in developing countries through the HINARI, AGORA, and OARE programs. Through its website (www.the-aps.org), the APS provides patients access to articles of interest. Recently, the Society began working with DeepDyve to provide reader access to individual journal articles for \$0.99.

The implementation of a public access policy across federal agencies would affect APS members as authors, editors, and readers of the APS journals and as beneficiaries of the Society's programs. Publishing peer-reviewed journals is the primary revenue stream of the APS. The health of the APS is dependent on its publications program which enables it to undertake a number of worthwhile activities designed to advance our science and promote the education and training of students interested in the physiological sciences.

The APS believes that in an Open Government it is important to solicit input from the public. For that reason, the Society appreciates the opportunity to submit comments and looks forward to continuing to be part of the dialog on how best to implement public access across the government.

Sincerely yours,



Gary C. Sieck, Ph.D.
President



Martin Frank, Ph.D.
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