

Alan I. Leshner  
Chief Executive Officer and  
Executive Publisher, *Science*

January 21, 2010

Office of Science and Technology Policy  
Attn: Open Government Recommendations  
Re: *Public Access Policies for Science and Technology Funding  
Agencies Across the Federal Government*  
Submitted via email: [publicaccess@ostp.gov](mailto:publicaccess@ostp.gov)

To Whom It May Concern:

On behalf of the American Association for the Advancement of Science (AAAS), thank you for the opportunity to submit comments on public access policies for science and technology funding agencies. Improving access to scientific and technical information is a longstanding commitment of AAAS and its three peer-reviewed journals, *Science*, *Science Translational Medicine* and *Science Signaling*.

Most nonprofit societies and publishers disseminate research articles to a range of audiences. The AAAS journals, including *Science*, make all of their peer-reviewed research articles freely available to the research community and the general public 12 months after publication. In addition, the content from our journals is disseminated through a wide variety of means, including reasonably priced annual subscriptions, institutional site-wide licenses, and a variety of large database services. Furthermore, World Health Organization initiatives such as HINARI (the Health InterNetwork: Access to Research Initiative), AGORA (Access to Global Online Resources in Agriculture), and SciDev.Net all provide *Science* and content from its sibling journals to scientists in the world's poorest countries at no cost. Articles with important public health implications are always made freely available as soon as they are published. *Science* also uses multimedia and Web 2.0 tools to enhance opportunities for scientists, students and others to engage in dialogue around substantive topics.

AAAS believes it is important that the discussion surrounding public access must clearly distinguish between providing access to research results in support of scientific progress and access to scientific information as a crucial element of public engagement to enhance the understanding of science and its implications. The primary target audience for the technical research papers published in the scientific literature has always been the research community that utilizes the information to replicate, reproduce and expand that knowledge base.

Appropriate public access policies can increase the access of scientists to the published literature. However, whatever their public access policies, federal science and technology agencies will retain a responsibility to inform the public about what federally supported research demonstrates, particularly as it relates to health and medicine, and to enhance public understanding of the peer-reviewed literature. Simply increasing public access will not adequately substitute for these public engagement activities, and should not be seen as a way to replace them. The federal government must continue to support public education programs as well as sustain repositories of scientific information in support of the conduct of research.

As for posting to federal repositories (e.g., PubMedCentral), AAAS journals allow authors who are required by their funding agency to make their research publicly available to post in the repository the “accepted version” of a paper six months after publication, provided the posting is linked back to the original published version and includes the published paper’s full reference citation. The “accepted version” is the version of the paper accepted for publication after changes resulting from peer review, but before AAAS’s editing, image quality control, and production. Many errors are corrected in final, copy-edited versions of manuscripts, and additional corrections to some research articles may arise several months after publication. *Science* currently takes responsibility for clearly linking corrections, retractions, letters and technical comments to the original paper posted on [www.sciencemag.org](http://www.sciencemag.org). This policy is consistent with the recommendations outlined in the recent report on public access by the Scholarly Publishing Roundtable.

In 1880, Thomas Edison took a pioneering step in communicating the results of research to a broad audience of scientists by creating a truly multidisciplinary journal called *Science*. AAAS will continue to experiment with different mechanisms for disseminating scientific information as technology evolves, and we welcome the introduction of experimental models by other publishers, believing that a diversity of approaches is the best strategy for advancing science and serving the public good. Hence, we believe that public access policies should reflect that diversity of perspectives and allow for evolutionary change in models for disseminating scientific information.

If you have any questions regarding these comments please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Alan Leshner', written in a cursive style.

Alan I. Leshner

## **American Physical Society response to Office of Science and Technology Policy Request for Information on Public Access Policies for Science and Technology Funding Agencies Across the Federal Government**

The American Physical Society (APS) has as its objective "the advancement and diffusion of the knowledge of physics", and to this end it serves the international community of physicists by publishing nine high-quality, cost-effective journals. The APS has adopted the following position on Open Access:

*The APS supports the principles of Open Access to the maximum extent possible that allows the Society to maintain peer-reviewed high-quality journals, secure archiving, and the Society's long- term financial stability, to the benefit of the scientific enterprise.*

APS was the first publisher to explicitly allow "Green Open Access" for all papers and has been a pioneer in providing electronic access to its journals. APS would be willing to make all of its journal content freely available on the Internet, if there were a viable way to do this and still sustain the important work that we do as a publisher and a society.

We emphasize that the publication of peer-reviewed scientific literature is an activity of impressive scale and complexity, and one which is of vital importance to the health of science. In an era in which vast amounts of un-refereed scientific literature are available on the web, refereed journals take on special importance and their publishers perform critical services: they identify literature that relevant scientific communities have singled out as sound, significant and worthy of dissemination and preservation. In addition, they manage the peer-review system and provide copyediting and full-text electronic formatting, thereby facilitating electronic linking of references, sophisticated search capabilities, and secure archiving on well-designed and stable online platforms. These activities cost significant amounts of money, and ensuring an adequate and stable source of funding for them is critical to the long-term health of the scientific enterprise. The APS believes that these considerations must be central to discussions of open-access funding models.

An important recent contribution to this discussion is contained in the report of the Scholarly Publishing Roundtable. The subject is complex, and we would like to note that while we agree with many of the recommendations of that report, we have serious reservations about others. More importantly, we fully support ongoing discussions involving all stakeholders in order to identify the most effective ways to provide wide public access to the results of federally-sponsored research, while maintaining the benefits to the scientific enterprise of the peer-reviewed publishing process. As a major scientific publisher, we expect to participate actively in this process.

Kate P. Kirby, Executive Officer

Joseph W. Serene, Treasurer/Publisher

Gene D. Sprouse, Editor in Chief



*Council*

January 21, 2010

**Brian M. Cox**

*President*  
Uniformed Services University  
of the Health Sciences

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FASEB Board Representative  
Drexel University

**Jack Bergman**

*Program Committee*  
Harvard Medical School - McLean  
Hospital

**Christine K. Carrico**

*Executive Officer*

**9650 Rockville Pike  
Bethesda, MD 20814-3995**

**Phone: (301) 634-7060**

**Fax: (301) 634-7061**

**info@aspnet.org**

**www.aspet.org**

Re: Public Access Policies for Science and Technology Funding Agencies Across the Federal Government

Office of Science and Technology Policy  
Attn: Open Government Recommendations  
725 17<sup>th</sup> Street  
Washington, DC 20502

Via e-mail: [publicaccess@osttp.gov](mailto:publicaccess@osttp.gov)

The American Society for Pharmacology & Experimental Therapeutics (ASPET) offers the following comments in response to the Office of Science and Technology Policy request for comments regarding input from the community regarding enhancing public access to archived publications that resulted from research funded by federal science and technology agencies.

ASPET is a professional society of 4,700 pharmacologists conducting research in academia, industry, and government. ASPET is the leading scientific society of pharmacologists. We publish five journals covering a wide range of pharmacological topics. ASPET is supportive of public access but believes that the business and publishing needs of organizations like ours should not be mandated by Federal funding agencies. Our comments are below.

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?
- Non-profit and commercial publishers invest hundreds of millions of dollars each year in the publication process. These activities include peer review, copyediting, production workflows for print and online dissemination, and the archiving of scholarly articles. Furthermore, publishers are vital to help create and maintain important professional collaborations that help nourish and develop scientific expertise. The preservation of peer review to maintain quality control is essential. The majority of manuscripts submitted to ASPET's journals are not accepted for publication. However, even the authors of rejected manuscripts benefit from the comments on their work through the peer review process. Publishers must be able to recover the cost of peer review and production for their publications. This is currently done by ASPET through a range of modest fees including low subscription fees, low pay-per-view fees, and low author-paid publications charges. If public access is mandated to be less than 12 months, ASPET is likely to lose subscription and pay-per-view income, particularly for the Society's quarterly and bimonthly journals. That lost income will have to be replaced by higher publication fees imposed on authors. The research efforts of grantees could be compromised because it will be necessary to set aside more money for publication fees. If authors cannot afford the higher fees, it is likely that some journals that serve a small niche audience, though highly regarded, could be forced to cease publication altogether.

**American Society for Pharmacology and Experimental Therapeutics**

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?
  - Public access policy must accommodate existing and changing technologies. New technologies will transform scientific communication in coming years. There is no way to predict when or how this will occur. There is no guarantee that any federal public access policy developed today will meet the needs of tomorrow. Different publishers have different business models, and it is not clear what the implications will be if federal agencies mandate new requirements for articles published in peer reviewed journals. Any public access policy should provide a sufficiently long embargo period to allow publishers to recover their costs. A public access policy that requires publishers to make freely available the results of costly enterprises such as peer review and copyediting must provide an opportunity to recover those costs.
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?
  - ASPET's online journals are used by people throughout the world. Search engines allow researchers, who are the primary users, to find the information they need. ASPET already makes all of its content published since 1997 freely accessible 12 months after publication. The manuscript version of primary research articles is freely available immediately. The content in ASPET's journals is preclinical and used by researchers with advanced levels of technical and scientific expertise. It is not likely that the general public would benefit in any way from increased access to this content.
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?
  - Public demand will likely vary from one discipline to another. There is no one-size-fits-all solution. It is important that federal agencies work with publishers to evaluate the level of access and how this might increase. Federal agencies must be prepared to cover the costs of peer review and manuscript preparation if they want to remove opportunities for publishers to recover these costs. Journals that cannot cover their costs will likely cease publication.
5. What features does a public access policy need to have to ensure compliance?
  - Full compliance can only result from a system jointly developed between the federal government, nonprofit publishers, commercial publishers, and scientists.
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, which is the version of record, should be used. Significant differences can exist between the manuscript and final version of a research article. Manuscript versions may contain errors that could cause serious harm, and multiple versions can create confusion. However, mandating that the version of record be made publicly available puts the federal government in competition with publishers and decreases the ability of publishers to recover their costs.
- 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?
- Embargo periods will differ depending on scientific discipline, and it is critical that OSTP work in conjunction with federal agencies and with publishers to accommodate these divergent needs. One size does not fit all. ASPET has made its content freely available after 12 months and has seen a steady decrease in subscriptions. Its newest journal, launched in 2000, has never gained many subscribers despite having a high impact factor. These data indicate that a 12 month embargo may suffice for some journals but may not be long enough for others. There is no single solution that will work for all disciplines and all publication models.
- 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?
- Articles should be hosted online by publishers. Search engines such as Google and Google Scholar already “make it easy to search, find, and retrieve” content from many sources and for others to link to it. For the government to develop any technology or system to duplicate or replace existing search engines would be a waste of taxpayer dollars. Publishers, information technology firms, and search engines, through costly investment, have already developed systems of tagging metadata to enable data mining and other means of discoverability. Publishers are constantly evolving the technologies used for data presentation and preservation.
- 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?
- Scholarly journals provide service, invest time and money, and assume other risks in publishing scientific information. Developing certain metrics of success may or may not be relevant since these metrics would have no bearing on the actual scientific content of the publication. Scientific applications and data become useful to people when those findings are applied to their real lives. Those applications may take years or decades to develop into something that will improve a life. It is usually impossible

to predict how a scientific discovery will impact future research and when it will contribute to or produce a breakthrough that will impact lives.

The American Society for Pharmacology and Experimental Therapeutics is grateful for the opportunity to provide these comments. ASPET has been publishing scientific journals for over 100 years and currently publishes the following five peer-reviewed journals:

*The Journal of Pharmacology and Experimental Therapeutics* (founded in 1909)

*Pharmacological Reviews* (founded in 1949)

*Molecular Pharmacology* (founded in 1965)

*Drug Metabolism and Disposition* (founded in 1973)

*Molecular Interventions* (founded in 2000)

It does this work as part of its mission “to promote pharmacological knowledge and its application and to conduct research pertaining thereto”. Some ASPET journals have lost money since their inception, yet the Society continues to publish them because they are valued by researchers as shown by their impact factors and contribute to the advancement of pharmacological research.

That being said, the Society cannot afford to lose money on its publications program overall. ASPET has been making the version of record of its peer-reviewed content freely available after 12 months from its own journals’ web sites. In addition, the Society has been depositing the version of record of content funded by the NIH in PubMed Central since January 2009. That content is only now becoming publicly accessible at PubMed Central, and we do not yet know what impact that will have on the use of content from our journals’ sites. If usage is drawn away from our journals, subscription cancellations will likely follow. Government funding does not pay for peer review and contributes little if anything to other aspects of the publication process. Federal agencies must not be in direct competition with publishers for their content and must not take away the opportunity for publishers to recover their costs. The future of scholarly communication is at stake.

Sincerely,

A handwritten signature in black ink that reads "Christie A. Carriero". The signature is written in a cursive, flowing style.

Executive Officer



Washington DC PRINCIPLES for  
**FREE ACCESS to SCIENCE**  
[www.dcpinciples.org](http://www.dcpinciples.org)

**Allan Adler**

VP, Government & Legal Affairs  
Association of American Publishers  
50 F Street, NW, Suite 400  
Washington, DC 20001  
Tel: (202) 220-4544  
Fax: (202) 3473690  
Email: [aadler@publishers.org](mailto:aadler@publishers.org)  
[www.pspcentral.org](http://www.pspcentral.org)

**Martin Frank, Ph.D.**

Executive Director  
American Physiological Society  
9650 Rockville Pike  
Bethesda, MD 20814-3991  
Tel: (301) 634-7118  
Fax: (301) 634-7241  
Email: [mfrank@the-aps.org](mailto:mfrank@the-aps.org)  
[www.dcpinciples.org](http://www.dcpinciples.org)

January 21, 2010

Dr. Diane DiEuliis  
Assistant Director, Life Sciences  
White House Office of Science and Technology Policy  
725 17<sup>th</sup> Street, NW  
Washington, DC 20502

RE: Public Access Policies for Science and Technology Funding Agencies Across the Federal Government

Dear Dr. DiEuliis:

On behalf of the members of the Professional and Scholarly Publishing Division of the Association of American Publishers (“AAP/PSP”) and the DC Principles Coalition for Free Access to Science (“Coalition”), we are pleased to respond to OSTP’s December 9, 2009 Federal Register Notice requesting comments on “Public Access Policies for Science and Technology Funding Agencies Across the Federal Government.” Collectively, we represent tens of thousands of publishing employees and professional members across the country, and publish millions of peer-reviewed scholarly and scientific journal articles in a multitude of disciplines.

Scholarly and scientific journal publishers strongly support the guiding principles of transparency, participation and collaboration that President Obama and OMB Director Orszag detailed in the January 2009 “Transparency and Open Government Memorandum” and December 2009 “Open Government Directive,” respectively.<sup>1</sup> For over 100 years, these journal publishers have played an integral role in building the unrivalled U.S. scientific research enterprise, a dynamic community that thrives on these core principles. Now, these publishers seek to partner with the Administration to harness the power and potential of technology and innovation to spur long-term economic growth and provide cutting-edge solutions to support domestic priorities, including healthcare reform, clean energy development, and STEM education renewal. A transparent, participatory and collaborative Federal Government will provide the foundation for achieving these important goals.

AAP/PSP and the Coalition provide recommendations below that will facilitate the successful development of a sustainable and effective public access policy consistent with the Administration’s “Open Government” framework.

Specifically, our comments address the following questions outlined by OSTP’s December 9 Federal Register Notice requesting public comment:

1. **The Role of Journal Publishers in the Scientific Research Enterprise in 2010.** How do journal publishers 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?
2. **Key Principles to Ensure a Sustainable and Effective Public Access Policy.** 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?

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<sup>1</sup> Memorandum for the Heads of Executive Departments and Agencies on Transparency and Open Government (January 21, 2009), available at [http://www.whitehouse.gov/the\\_press\\_office/TransparencyandOpenGovernment/](http://www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment/); Memorandum for the Heads of Executive Departments and Agencies on Open Government Directive available at <http://www.whitehouse.gov/open/documents/open-government-directive>

## SUMMARY OF COMMENTS AND RECOMMENDATIONS

- For over 100 years, journal publishers have served as integral hubs of the scientific research enterprise, facilitating scholarly communication and the dissemination of scientific information, managing the scientific record and coordinating the peer review process. In 2010, their continuing investments in digital platforms with the latest Web 2.0 capabilities have helped to deepen their contributions to the science community and the public— expanding accessibility, improving interoperability and fuelling innovation.
- Journal publishers strongly support the view that the Federal Government should be guided by “principles of transparency, participation and collaboration” as noted in the Transparency and Open Government Memorandum and Open Government Directive. President Obama emphasizes that “[c]ollaboration improves the effectiveness of Government by encouraging partnerships and cooperation within the Federal Government, across levels of government, and between the Government and private institutions.” In creating an open government and a sustainable agency-wide public access policy, it is critically important that these goals should be accomplished without damaging the private institutions on which the Federal Government and its scientific enterprise depends. The NIH Public Access Policy was developed on the flawed premise that an undefined public access benefit to researchers, practitioners, and the general public outweighs any harm that would result to the scientific publishing enterprise. The NIH model, however, does not meet the critical requirements for participation and collaboration that are necessary to develop and maintain the partnerships and cooperation that would ensure a sustainable and effective public access policy.
- A federal agency public access policy that is sustainable in the long-term and maximizes benefits to the science community and the public will:
  - ☑ Function as a balanced public-private partnership to enhance access and interoperability
  - ☑ Adequately protect fundamental intellectual property rights and respect proprietary contributions of added-value to ensure sustained private investment in innovation
  - ☑ Meet the needs of the science community by relying on evidence-based assessments and providing access to taxpayer-funded research results through both public and private channels
- The America COMPETES Act, which established a public access policy for research funded by the National Science Foundation (NSF), provides an acceptable model that can be replicated in a timely manner at other federal agencies. Under this approach, each federal agency that provides funds for the performance of experimental, developmental, or research activities would make (A) final project reports; (B) citations of published research articles resulting from research funded by the agency; and (C) readily accessible summaries of agency-funded research accessible to the public in a timely manner and in electronic form through an agency Web site and possibly through <http://www.data.gov>.
- The America COMPETES Act approach adheres to the President’s pledge in his Transparency and Open Government memorandum to “take appropriate action, consistent with law and policy,” and will better ensure that research dollars are consistently accounted for. Taxpayers will also gain access to the health, science and technical research results they have funded in formats that they can more easily understand. Publishers strongly support extending the NSF model to all federal agencies that fund research and will partner with the Administration to successfully implement such a public access policy.

## 1

**The Critical Role of Journal Publishers in the Scientific Research Enterprise in 2010.** How do journal publishers 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?

In its December 9 Federal Register OSTP Notice, the Administration acknowledges the critical role that scientific and scholarly journal publishers play in advancing scientific and medical discoveries. For over 100 years, journal publishers have served as integral hubs of the scientific research enterprise, facilitating scholarly communication and the dissemination of scientific information, managing the scientific record and coordinating the peer review process. In 2010, our members' continuing investments in digital platforms with the latest Web 2.0 capabilities have helped to deepen their contributions to the science, technological, engineering and medical communities — expanding accessibility, improving interoperability and fuelling innovation. What the Administration's OSTP Notice fails to fully recognize, however, is the extent to which journal publishers contribute significant added-value in the process that transforms a researcher's draft manuscript into a polished, peer-reviewed journal article that will serve as the official published record of the described research and its results.

**Managing the Scholarly Communication Infrastructure and Maintaining the Scientific Record.** Non-profit and commercial journal publishers invest hundreds of millions of dollars every year in the peer review, editing, disseminating, and archiving of scholarly and scientific articles, as well in creating unique journal brands and identities on which researchers and funders alike rely to make critically important personal and professional judgments. Journals typically support a specific discipline and serve as a central point of contact and information exchange for the members of that community, who are frequently spread around the world. The reputations of journals, cultivated by their publishers, are also used as an indicator of the importance of the work published therein to a particular field of research and to the public.

This is the critical infrastructure that has supported scholarly communication and spurred scientific and technological innovation for decades through numerous changes in media and publisher production and delivery mechanisms. As of early 2009, some 2,000 publishers produced over 25,000 peer-reviewed scientific, technical and medical journals, and recent statistics indicate that these journals alone publish more than 1.5 million articles annually. To facilitate this scholarly output, these journal publishers identify appropriate contributors and editors for each journal, ensuring that research results are reported and shared in a way that encourages further research. Upon careful review, a majority of the manuscripts submitted to a given scientific journal are found to be of insufficient quality for publication. In practical terms, this means that the publishers of such journals must finance the collection and review of several times as many manuscripts as they will actually publish to effectively serve as quality guardians for the scientific record.

To manage the processing of some 2 to 3 million manuscripts submitted annually by researchers around the world, journal publishers have established and maintained sophisticated online manuscript submission systems. Journal publishers also prepare the 1.5 million manuscripts that are accepted for publication by copyediting, proofing, formatting, branding, paginating, adding metadata and identifiers, checking and enhancing artwork quality, converting accepted manuscripts, data and artwork to XML, and adding links to ensure interoperability.

Journal publishers continually invest in new journals to support the needs of scholarly communities and to ensure that intellectual communication keeps pace with new and growing areas of science and scholarship. In fact, the number of new journal titles and the number of journal articles published each grows at a rate of about 3% per year, consistent with increases both in the number of researchers and in funding for research and development.

**Protecting Scientific Integrity.** Perhaps the most vital contribution of these journals is the coordination of the peer review process for research publication. The peer review process is an essential quality-control mechanism that helps to ensure the veracity of the published research reports and to facilitate their communication through enhanced readability. In a 2008 international survey of over 3000 scientists, 85% agreed that peer review greatly helps scientific communication by improving the quality of published papers. In addition, 83% believed that, without peer review, there would be no control over the integrity of science research.<sup>2</sup>

Journal publishers incur substantial expenses by supporting their editors in conducting peer review. These costs include (1) the highly skilled people required to manage the process, (2) purchasing, maintaining and updating the technology to streamline the process, (3) keeping track of reviewers and articles, (4) locating and maintaining relationships with possible reviewers, (5) sending articles out to appropriate reviewers and following up with them to make sure the reviews are completed, and (6) reviewing the responses and communicating those responses to authors.

<sup>2</sup> <http://www.publishingresearch.net/documents/PRCsummary4Warefinal.pdf>

These steps are typically managed with the use of specialized software systems that are internally developed, licensed commercially or supported by open source software. In addition to the software system, the necessary hardware must be acquired and maintained. Although software is very useful in organizing and managing the peer review process, the editors must evaluate the reviews and determine how to respond to them. Software cannot substitute for human editorial skill and judgment.

In addition to the peer review process, the journal publisher's determination to accept or reject a researcher's submitted manuscript, based on the publisher's own quality standards and expertise developed through years of building the brand reputation of the journal, is itself an important part of the process for maintaining the integrity of the published record of scientific research. As previously noted, it is commonly understood within the research community that an overwhelming majority of the submitted manuscripts are found to be unacceptable for publication.

**Fueling innovation with new technology.** Since the mid 1990s the journal publishing industry has been a key player in the dramatic digital revolution in the sciences, investing heavily to drive the shift of published research from print-only to "E-only." According to a 2008 survey by the Association of Learned and Professional Society Publishers, 96% of science, technical and medical journals are available online.<sup>3</sup> That number continues to grow.

The results of the end-to-end digitization of publishing systems are robust digital platforms with the latest Web 2.0 capabilities that can support the Federal Government's effort to link policymakers, researchers and the public. Rapid innovation in the journal publishing industry has dramatically improved functionality and efficiency for doctors and researchers, who can now perform complex searches of journals, immediately retrieve and print full text articles, link instantly to other cited articles, export text to other databases and programs, and receive e-mail alerts when new journal issues are released. Voluntary cross-publisher initiatives such as CrossRef, developed with non-government funds, have broadened the impact of these benefits for researchers.

The result of these productivity benefits has been documented in the field of science. The portion of their time scientific researchers spent analyzing (vs. gathering) information increased dramatically from 2001-2005. Compared to the print-only era, scientists now read 25% more articles per year from almost twice as many journals, and they do so using a smaller portion of their time.<sup>4</sup> This dynamic yields major benefits in research and funding effectiveness.

To make it easier to locate and use research information, journal publishers continue to make substantial investments in:

- Creating, supporting and maintaining robust hardware and software infrastructures to distribute and archive science research literature, and updating those tools as the needs and expectations of authors and users of journal literature change over time.
- Verifying references and creating, managing and maintaining online links, providing coding for digital dissemination, integrating machine-readable tags, supporting reference linking and indexing, and otherwise enriching the content, design and functionality of online publications.
- Encouraging and supporting the development of interoperable, industry-standard tools for citation and other purposes, such as "persistent identifiers" (that is, the articles' unique identifiers for researchers to ensure that they are using and citing the authoritative version of the article).
- Creating visibility of research results through arrangements with third-party vendors that push relevant research information to the appropriate research communities through a combination of traditional tools and emerging technologies, such as abstracting and indexing services, citation databases, table-of-contents alerting services, podcasts, RSS feeds, press communications and sponsorship of scientific and technical conferences, seminars and symposia.

**Risks Facing the Public Science Enterprise Under a Mandatory Public Access Policy.** As OSTP, the publishing industry and the research community explore new ways of providing greater public access to the results of government-funded scientific research, an approach that appropriately balances competing interests should be pursued. The NIH public access model, established before President Obama took office, is not the solution to the need for a collaborative effort among information providers, users and government. Rather, that model provides a cautionary tale about the risks of government mandates requiring access to manuscripts of peer-reviewed science journal articles.

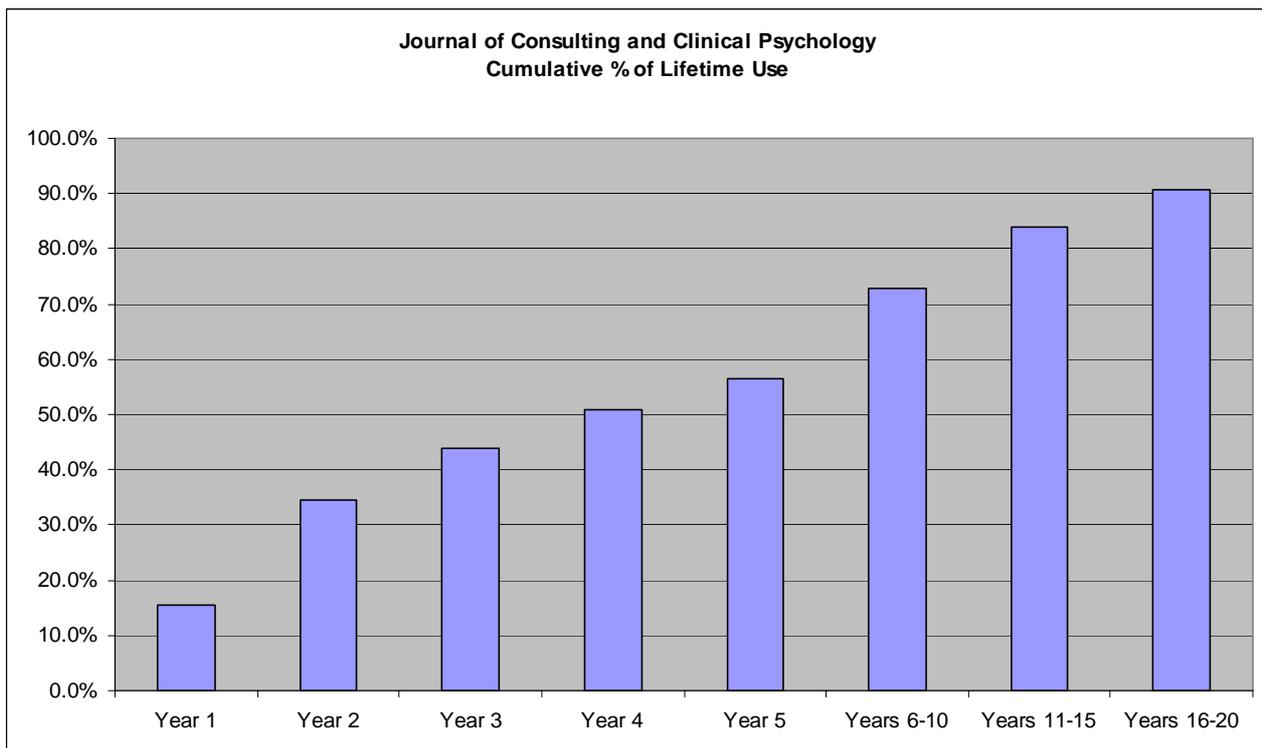
<sup>3</sup> Scholarly Publishing Practice Third Survey, ALPSP

<sup>4</sup> Outsell's Buyer Market Database, Dr. Carol Tenopir (2008)

While it is possible to adjust voluntary, collaborative activities over time, i.e. after evidence of their results and consequences has been gathered, mandates are inflexible and present serious policy challenges when they result in damage to private partners that cannot be undone without burdensome policy adjustments. The NIH mandatory public access policy has only been in place for a relatively short time (i.e. since May 2008); as a result, there has not been any comprehensive study of its impact on members of the general public (who are its assumed beneficiaries) or on journal publishers (whose work, reputation and expertise it exploits). Mandatory public access policies, like the one implemented by NIH, present high risks that journals will be adversely impacted and their long term economic sustainability threatened. Some subscribers to such journals are likely to cancel subscriptions and simply wait for free access to them. Mandatory policies would threaten the survival of many scientific societies and other journal publishers that rely on subscription fees to finance their operations. Although some indications of harm are emerging, we recognize that the impact of the NIH policy is still inconclusive. However, once a tipping point is reached that prevents journals from continuing, it will be too late to change such policies and reverse the damage.

As a government-imposed mandate, the NIH model will face particular difficulties in adjusting to the rapid pace of change in journal publishing. This will become clear if its “one-size-fits-all” policies are imposed across subject disciplines. A recently released study of journal publishing in the humanities and social sciences concludes that, given the comparatively long life of articles in those fields, the imposition of embargo periods that are being adopted for biomedical journals could threaten the sustainability of humanities and social science journals.<sup>5</sup>

This is corroborated by research conducted by the American Psychological Association, which found that only 15% of the eventual “lifetime” usage of its journal articles – in the form of downloads – occurs within the first year after publication. The graphic below demonstrates that articles published in the APA’s 37 journals have a long half-life and lifetime usage of about 4.5 and 19.5 years, respectively. Because life-time utilization of APA journal articles occurs over a long period of time (much longer than the first 12 months), the rigid NIH public access policy will likely have a significant, negative impact on APA journals and all other journals with similar usage patterns.



More broadly, studies are being conducted to understand how alternative models for providing free access to journal content would affect paid journal subscriptions. Subscriptions account for approximately 90% of revenue for many journal publishers. That revenue underwrites the critically important publishing functions discussed earlier. For non-profit societies, subscription revenues provide the means for symposia and member education, internships, research and other critical activities that advance science. In 2006, the Publishing Research Consortium (PRC) commissioned a study of how decision-making factors such as price, embargo period, article version and reliability of access would affect librarians’ subscription or cancellation behavior. The survey suggests

<sup>5</sup> “The Future of Scholarly Journals Publishing Among Social Science and Humanities Associations,” Report on a study funded by a Planning Grant from the Andrew W. Mellon Foundation (February 2009), available at: <http://www.nhalliance.org/bm~doc/hssreport.pdf>

that a significant number of librarians are likely to cancel subscriptions even when just some of a journal's peer-reviewed manuscripts are available freely through open access.<sup>6</sup>

With a twelve-month access delay, assuming only 40% of a journal's content would be available for free, a large proportion (44%) of librarians in the study said they would opt for free content to portions of the journal over a paid subscription. When more than 40% of a journal's manuscripts are available freely on open access, the librarians' expressed an even greater preference for the free option over journal subscriptions. These findings raise serious doubts about whether librarians would continue to subscribe to journals if some or all of the content was freely available on institutional archives. The study counters the proposition that scientific publishers—and the scientific endeavor itself—will not be harmed by an indiscriminate move towards unrestricted open access that does not take into account such unintended consequences. In fact, the results indicate just the opposite, showing that embargoes will not prevent harm.

The results of the PRC study are worthy of serious consideration, given the importance of subscriptions to sustaining journal publishing and its essential role in ensuring the integrity, dissemination and preservation of the world's scientific, technical and medical information, as acknowledged in the Federal Register Notice. The U.S. science publishing market represents some \$7-8 billion in revenue, of which journals comprise about \$3 billion. Over 1000 U.S.-based science journal publishers (including both commercial publishers and many society publishers) employ over 30,000 staff and indirectly support an additional 20,000 workers. North American-based science journal publishers account for 45% of all peer-reviewed research papers published annually for researchers worldwide.<sup>7</sup>

T. Scott Plutchak, Director of the Lister Hill Library of the Health Sciences at the University of Alabama at Birmingham accurately characterizes the fundamental flaws of the NIH model<sup>8</sup>:

*Explicit in the NIH policy is that peer review has substantial value – so much so, that NIH does not want any manuscripts deposited that have not gone through a rigorous peer review process and gotten the stamp of approval from a recognized peer review authority – i.e., a publisher. In developing the policy, NIH could have come up with their own vetting mechanism, but instead they quite sensibly chose to rely on the experts in managing peer review.*

*In "the old days" (when everybody understood what the rules were), publishers gained control of copyright in exchange for managing the peer review process. They were then entitled to use that control to develop revenue streams that would compensate them for the value that they were adding to the system. Copyright gave them control of the distribution of the work to which they had added value. Under the terms of the NIH policy publishers are expected to give up that control...*

*It is argued that this is not an unfair "taking" since the publisher has the right to refuse to grant the license that allows the author to deposit with Pubmed Central. This is, no doubt, technically and legalistically true. But since when is a choice between complying with a policy and going out of business a real choice? "Dear publisher – we respectfully ask that, for the benefit of the common good, you give up control of the most significant element of value that you add to the scholarly communication process. We don't actually have any way of compensating you for that, so you are perfectly free to refuse to do so - in which case, you will, of course, be put out of business since you will no longer receive the manuscripts that are your bread and butter... Good luck."*

President Obama's Transparency and Open Government Memorandum emphasizes that "[c]ollaboration improves the effectiveness of Government by encouraging partnerships and cooperation within the Federal Government, across levels of government, and between the Government and private institutions." In creating a sustainable agency-wide public access policy for the results of government-funded science research, it is critically important that it be accomplished without damaging the private institutions on which the Government depends, both for the information itself as well as a substantial tax and employment base. The NIH Public Access Policy was developed on the flawed premise that an undefined public access benefit to researchers outweighs any harm that would result to the scientific publishing enterprise. Before any consideration is given to extending it to the entire federal research arena, its long term impact on all stakeholders must be more fully understood.

<sup>6</sup> Publishing Research Consortium Report "Self-Archiving and Journal Subscriptions: Co-existence or Competition" (July 2006). Accessible at [http://www.publishingresearch.org.uk/documents/Self-archiving\\_report.pdf](http://www.publishingresearch.org.uk/documents/Self-archiving_report.pdf).

<sup>7</sup> Scholarly Publishing Practice Third Survey, ALPSP

<sup>8</sup> "Quantifying the Value of Peer Review," available at: <http://tscott.typepad.com/tsp/2009/06/quantifying-the-value-of-peer-review.html>

## 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?

These recommendations seek to balance the need for and potential of increased access to journal publishing with the need to preserve the essential functions of the journal publishing enterprise. A sustainable federal public access policy that maximizes benefits to the science community and the public should:

**Function as a balanced public-private partnership to enhance access and interoperability.** Any federal public access policy should be developed in full and open consultation with all vested stakeholders to define clear measurable goals and objectives, and to take into account key differences in publishing dynamics across subject disciplines. In his Transparency and Open Government memorandum, President Obama notes that “[c]ollaboration harnesses innovative tools, methods, and systems to promote cooperation across all levels of Government and with the private sector.” AAP/PSP and the Coalition strongly encourage this collaboration with industry and recommend that the Federal Government leverage the private sector’s rapidly evolving expertise, technologies, products and services in order to efficiently and effectively improve the quality and scope of services available to the public.

### ADMINISTRATION NEXT STEPS

1. Form OSTP public access advisory committee composed of publishers, universities and other research entities. Utilize public-private partnerships in implementation of any public access policies

Federal agencies are not always aware of existing technologies and solutions in the marketplace, resulting in unnecessary spending and a misallocation of taxpayer dollars—particularly when the Government duplicates and competes with products and services provided by the private sector. For example, the NIH did not proactively seek collaboration with journal publishers as it developed its procedures and policies for the deposit of NIH-funded researchers’ manuscripts into its central repository. Consequently, NIH created an unnecessary separate archive and tagging system at considerable expense and with minimal interoperability with existing data repositories.

As noted in the Scholarly Publishing Roundtable Report, OSTP should collaborate closely with publishers, universities and other research entities to “achieve the full potential of publicly accessible, interoperable databases. OSTP should establish a public access advisory committee to provide a mechanism for periodic assessment of the rapidly changing scholarly publishing landscape.”<sup>9</sup>

**Adequately protect fundamental intellectual property rights, respect value-adding publisher contributions, and uphold long-established principles of government information policy to ensure sustained investment in innovation.** In April 2009, President Obama committed to “create conditions for increasing public investment and to take measures that promote investment in the private sector, particularly in science, technology, engineering, innovation, research and development, and to encourage the strengthening of linkages between universities, science institutions.” President Obama further noted that strong protection and enforcement of intellectual property rights would help achieve these objectives and contribute to the promotion of technological innovation and the transfer and dissemination of technology.

Given the Administration’s strong support for intellectual property rights in this context and others, it is disturbing to note that the OSTP’s Federal Register Notice fails to mention or solicit public comment on the adverse impact that mandatory public access policies for science and technology funding federal agencies could have on the exploitation of copyright rights that science journal publishers acquire from government-funded researchers who submit manuscripts describing the nature and results of their research for publication in such journals.

### ADMINISTRATION NEXT STEPS

2. Consult closely with IP stakeholders in Administration and Congress to shape federal public access policy

But moving toward federally-mandated agency public access policies based on the NIH model would directly contravene President Obama’s stated mission and would violate fundamental copyright principles that form the basis of the U.S. intellectual property framework. For over a century, copyright protection has provided the incentive for journal publishers to invest in the peer review of research prior to publication and in the infrastructure necessary to publish and distribute science journal articles about the latest government-funded research. While the technology for disseminating works has changed, the need for investment incentives has not. Publishers still depend on copyright to protect these works that aid in the advancement and integrity of science and contribute to

<sup>9</sup> “Scholarly Publishing Roundtable Report and Recommendations,” p. 8 (January 2010).

substantial gains in biomedical research and other knowledge. Their journal articles are goods that benefit society generally, and are certainly integral to the President's innovation and economic goals. Incentives for their production must be maintained. The long-run consequence of depriving the private sector of continuing incentives for investment will be government-run science publishing. Such an outcome would undermine the President's policy of letting the private sector lead in technological innovation. It could also risk the danger of the Government's politicization of science, where published accounts of science research conducted on global warming, stem cell research, evolution, or other matters that generate political controversy over related public policy-making might be subject to efforts of suppression or manipulation that will call into question the integrity of the scientific record.<sup>10</sup>

The NIH Public Access Policy requires any investigator whose research has been funded by NIH to submit their final, peer-reviewed manuscript to NIH immediately upon acceptance for publication as an article in a science journal, so that NIH can make the manuscript freely available online – in direct competition with distribution of the publisher's own final published version – no later than 12 months after its publication. NIH specifically requires submission of the final manuscript only after it has passed through the publisher's "quality assurance" processes of peer review and determination of acceptability for publication, even though the journal publisher is not a party to the funding agreement for the research.

Such an arrangement is fundamentally unfair to the journal publisher because it allows NIH, without providing just compensation, to deliberately take the value of the publisher's "quality assurance" processes and also undermines the publisher's right to distribute the final published article. The performance of these publishing services constitutes valuable consideration that the journal publisher provides to the manuscript author in explicit expectation of the author's transfer of copyright in the manuscript to the publisher following acceptance for publication. Journal publishers rely on copyright transfers to ensure that they have all of the rights that are essential to support their investments in the publishing enterprise. These investments are dependent upon the expectation of full copyright protection of the work in order to safeguard interests of the author as well as those of the publisher in the integrity and original expression of the manuscript work as it evolves into the final published article. Authors benefit from their transfers of copyright to journal publishers because the transfers provide the publishers with the incentives to invest in the manuscripts and transform them into high-quality peer-reviewed articles that are published under journal names that signify the quality of their contents based upon brand reputations developed and recognized through decades of publishing investment and experience. Publication in such journals is critical to a researcher's recognition and advancement within a given research discipline, and provides researchers with important credentials for seeking positions within the academic community.

Some may argue that public access policies based on the one at NIH do not take any intellectual property away from journal publishers or change the scope of the publisher's copyright after the publisher has acquired it because the copyright is, under such policies, already subject to the funding agency's requirements for public access when the author transfers copyright to the publisher as a condition of publication. While this may literally be true, it misses the point that, with the expiration of the embargo period that runs from the publication of the final article in the journal, the agency's public access requirements eviscerate the publisher's practical ability to exercise the rights of copyright acquired from the author. After the expiration of the embargo period, the publisher's right to control the distribution of the article will have to compete with the agency's making available of an earlier, peer-reviewed final manuscript version of the article free to the online world.

In effect, the application of government public access mandates like the NIH Public Access Policy is indistinguishable from the imposition of an extraordinary and unprecedented exception to the most fundamental of rights under copyright—namely, the exclusive right to distribute the copyrighted work. The Government's funding of the research should not provide the basis for the funding agency to claim fundamental rights in every written account of the results of that research, and particularly in those written accounts that reflect substantial value added by publishers as they become the recognized published record of the research and its results.

Government agencies might attempt to trump copyright through blanket requirements in grant contracts that would essentially force authors and journal publishers to compromise their copyrights—without compensation for the publishers' investments. This type of government action might lead agencies to claim that taking and distribution of the copyrighted articles is consistent with copyright law. But it is not consistent with copyright principles. Such principles are meant to prevent harm to the potential market for copyrighted works—harm which would be highly likely if near-final earlier versions of the copyrighted works were distributed worldwide, for free, in competition with the rightsholders' final published version.

An unintended consequence of the NIH Public Access Policy as it affects publishers' and authors' rights appears to be an increase in the rise of piracy of U.S. scientific and scholarly journal articles globally. For example, over the

<sup>10</sup> "Political Interference with Climate Change Science Under the Bush Administration," Report by the House Committee on Oversight and Government Reform, available at <http://www.lpl.arizona.edu/resources/globalwarming/documents/political-interference.pdf>

past several years, Chinese companies have been acquiring electronic copies of copyrighted U.S. scientific journal articles from government and university libraries and reselling them through online websites to legitimate producers' primary customers. U.S. publishers and scientific societies are facing annual losses of \$80-100 million as a result of this expanding theft and have been working closely with the Office of the U.S. Trade Representative and U.S. Department of Commerce to address this egregious problem.<sup>11</sup> However, in recent months, we have found evidence that suggests Chinese pirate companies may also be mining full text articles from NIH websites and reselling these articles to their subscribers.<sup>12</sup> Unfortunately, these Chinese entities are now relying on a U.S. government website to facilitate the theft of U.S. intellectual property.

The underlying policy consequence is that making peer-reviewed journal articles freely available via NIH websites appears to be contributing directly to piracy of copyrighted U.S. biomedical journals and journal articles. For many journal publishers, more than 50% of their revenue comes from overseas subscriptions. Expanding the NIH model to other agencies will directly undermine government and industry efforts to protect U.S. intellectual property rights abroad, undercutting the Administration's "National Innovation Strategy," which notes that "[i]ntellectual property is to the digital age what physical goods were to the industrial age" and that the U.S. government "must ensure that intellectual property is protected in foreign markets."

**Meet the needs of the public and stakeholders in the research community by providing access to taxpayer-funded research results.** Publishers agree that taxpayers should have access to taxpayer funded *research*, and that the government should ensure access to such *research*. It must be noted, however, that while taxpayers fund research, they do not fund the publication of research results in peer-reviewed science journals. Accordingly, accessibility to the results of taxpayer-funded research, which the Government can provide through a variety of means, does not equate to accessibility to research articles published in peer-reviewed science journals.

Government, through its funding agencies, supports the research enterprise that generates outputs such as experimental data, technical reports, grant reports, and conference papers. Consequently, government has an important interest in ensuring that research data and technical reports are accessible to the public whose taxes funded their production. .

A policy supporting broader access to *research* would meet a clear need: the 2006 Audit of Interest Study by the NSF Office of Inspector General determined that project reports and publication citations were the preferred form of research results that the public would like to access. In addition, scholarly research articles are not usually very comprehensible, even to researchers or practitioners in the field and certainly not to the public at large. In terms of the needs of the research community, according to a recent survey, access to journal articles is only 14th on researchers' lists of concerns, behind lack of funding (1<sup>st</sup>) and too much bureaucracy (5<sup>th</sup>).<sup>13</sup> Any further development of federal public access policy in this area should be based on thorough assessment of the needs of all stakeholders. For example, the Administration could consider a pilot program similar to the EU's PEER (Publishing and the Ecology of European Research) initiative. PEER represents a three-year collaboration (2008 to 2011) between publishers, repositories and researchers that will investigate the effects of the large-scale, systematic depositing of authors' final peer-reviewed manuscripts on reader access, author visibility, and journal viability, as well as on the broader ecology of European research. Empirical results from this program will inform the EU's future policymaking on public access issues.

#### ADMINISTRATION NEXT STEPS

3. Consider additional audits/assessments of public and science community access objectives to ensure evidence-based approaches
4. Review proposal for timely agency-wide implementation of NSF Public Access Policy as codified in the America Competes Act

At least one highly-successful and long-standing example of public-private partnerships to drive public access to – and public benefits from – the results of federally-funded research has demonstrated that such endeavors need not put the Federal Government in the position of expropriating any intellectual property rights of its private sector partners or, in the case of science journal publishing, "partners" who do not receive funding or have any contractual relationship with the Government. Indeed, under the Bayh-Dole Act, P.L.96-517, and the related Stevenson-Wydler Technology Innovation Act, P.L.96-480, the Federal Government has, for over thirty years, successfully utilized patent rights for inventions developed within the framework of cooperative research agreements between federal agencies, universities and private industry as incentives for universities and private

<sup>11</sup> 2009 U.S.-China Joint Commission on Commerce and Trade (JCCT) Factsheet. Available at <http://www.ustr.gov/about-us/press-office/factsheets/2009/october/us-china-joint-commission-commerce-and-trade>

<sup>12</sup> <http://www.kjmed.com.cn/kjmed/Products/pubmed.html>

<sup>13</sup> Access by UK small and medium-sized enterprises to professional and academic information Mark Ware Consulting Ltd for Publishers Research Consortium (April 2009)

industry to participate in the further research and development necessary to bring federally-funded innovations to practical application in the marketplace. Apparently, Congress recognized that there is nothing improper or unseemly about permitting universities and other private sector entities to benefit from exploiting intellectual property rights in the products of federally-funded research; in fact, Congress' decision to grant patent rights in inventions resulting from federally-funded research to academia and the businesses that develop and commercialize them has created jobs and businesses and generally benefited the public. In the case of science journal publishing and federally-funded research, publishers are asking much less of the Federal Government, since publishers do not seek to acquire any intellectual property rights in the research that is described in the articles they publish, but only to be able to exploit the intellectual property rights that they acquire from the federally-funded researcher with respect to the specific written account of the research that the researcher independently brings to the publisher for publication in the publisher's peer-reviewed journal.

Government should not impose mandates that pertain to outputs of the journal publishing process, including accepted author manuscripts as well as published journal articles. Such policies are not justifiable or warranted, do not meet a clear need and could cause significant harm. Any policy to mandate access to the outputs of the publishing process could destabilize the dynamic and well-functioning journal publishing system upon which researchers and society at large depend, and thereby cause serious unintended consequences. A mandatory public access policy will not reduce the costs of scientific publishing, but it could shift the burden of those costs away from subscribers and users of science journal articles and onto the authors and the funding agencies.

**A Sustainable Federal Public Access Policy.** AAP/PSP and the Coalition strongly agree that the Government should take steps to increase public access to the results of publicly-funded research. Specifically, we support a statutory directive for agencies to ensure such public access consistent with the model enacted by Congress in 2007 in the America COMPETES Act, which established a public access policy for research funded by the National Science Foundation (NSF). We support extending this model to all federal agencies that fund science research.

Under an America COMPETES Act model, each federal agency that provides funds for the performance of experimental, developmental, or research activities should provide, in addition to providing a database of summaries of funded projects, the following information to the public, in a timely manner and in electronic form through an agency Web site:

- (A) final project reports;
- (B) citations of published research documents resulting from research funded by the agency;
- (C) readily accessible summaries of the outcomes of agency-funded research projects.

This approach would adhere to the President's pledge in his Transparency and Open Government memorandum to "take appropriate action, consistent with law and policy, to disclose information rapidly in forms that the public can readily find and use." Expanding the NSF public access provisions across federal agencies will help establish a government-wide transparency framework that will ensure that research dollars are consistently accounted for. Taxpayers will also gain access to the health, science and technical research results they have funded in formats that they can more easily understand. Finally, adopting a comprehensive public access policy according to the NSF model will enhance government collaboration with the private sector by maintaining copyright protection for private-sector works that explain such research results, consistent with other priorities of the President for encouraging cooperation with the private sector, innovation and protecting intellectual property rights.<sup>1</sup>

Publishers are ready to develop this model into a collaborative public-private partnership by considering provision of journal abstracts and developing links from publication citations in project reports to the peer reviewed published journal article hosted on the publisher's website.

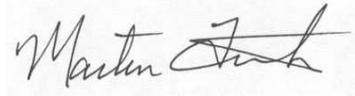
## Conclusion

The implementation of a comprehensive public access policy that extends the NSF-model, as enacted in the America COMPETES Act, to other funding agencies will firmly support the transparency, participation and collaboration pillars of an effective and open government. Such an approach will allow the Federal Government to broadly disseminate research results, while ensuring that copyright protections in private-sector research works are not weakened and that a healthy private publishing sector continues to complement the research enterprise by providing the services that are essential to the advancement of science and knowledge. In contrast, the NIH model, created prior to President Obama's Administration, fails to properly balance stakeholders' interests and needs. The NIH model has created a means for facilitating international piracy, in a global market upon which U.S. journal publishers rely to support their investment and innovation in publishing. U.S. publishers have invested hundreds of millions of dollars in developing web-based digital tools to improve scholarly research archiving, retrieval, navigation, cross-reference and use of science research information. Intellectual property rights are critical to ensuring that publishers have an incentive to invest in scholarly publishing innovation. They are also essential to ensuring the President meets his goals of a more transparent and participatory collaboration

between the private sector and the Federal Government in leveraging federal investments in research for the benefit of society as a whole.



**Allan Adler**  
VP, Legal & Governmental Affairs  
Association of American Publisher, Inc.



**Martin Frank, Ph.D.**  
Executive Director  
American Physiological Society

## **Response to the Office of Science and Technology Policy public consultation on Public Access to Federally Funded Research**

Submitted by the international Confederation of Open Access Repositories (COAR)  
January 21, 2010

### **Introductory Comments**

We would like to thank the White House Office of Science and Technology Policy for initiating this very important consultation on public access to research outputs. The Confederation of Open Access Repositories (COAR) is a not-for-profit association of repository initiatives that was launched in the Open Access Week at the DRIVER Summit in October 2009. We have members from over 25 nations around the world and are working towards the development of a global network of open access repositories to enhance the wide visibility and applicability of research outputs. COAR promotes infrastructure interoperability and a joint global data store of open access repositories to enable and support the re-use of data by service and portal providers. In particular, this will support the implementation of mandates of research funders and institutions. More information about COAR can be found on the temporary website: <http://coar-repositories.org/>.

Governments have a strong interest in developing efficient scientific information systems that maximize the impact of public investments in research. Improving the linkages between research and society is a key strategic aim. Yet, the current system for disseminating scholarly research is neither effective nor sustainable. Rapid price escalations in scholarly journal subscription rates, often referred to as the 'serials pricing crisis', have seen the costs of academic journals sharply climb for the past three decades.<sup>i</sup> Even the most well endowed research library cannot afford to provide access to all of the content requested by its faculty and students. The situation is even more critical for smaller colleges and universities, and institutions in the developing world, which already have limited budgets. In 2003, the Director-General of UNESCO, Mr. Koïchiro Matsuura stated that "Most developing countries have so far been unable to take full advantage of the advances offered by new information and communication technologies in terms of access to scientific and technological information and learning opportunities."<sup>ii</sup> The most effective way to address existing barriers to research dissemination is for research funders and universities around the world to implement public access policies. We have prepared responses that address all three phases of the consultation below.

### **Implementation**

Whether explicit or implicit, the transfer of research knowledge into society is part of research funding agencies' mandates. The Internet has created unprecedented opportunities for widespread knowledge sharing and public access to research results has become a viable option. The SHERPA-JULIET service in the UK, which monitors funding agency policies, now lists over 50 funding agencies with open access mandates from over 15 different countries.<sup>iii</sup>

Public access is best ensured by the wide spread adoption of public access policies by funding agencies and research institutions. Ideally, policies should require that affiliated authors make their research articles freely available through an institution or subject-based open access repository within 6 months of publication. Based on the previous experiences of other agencies around the world, we believe that public access policies are best designed as follows:

- **Policies must be mandatory.** The very low deposit rates of NIH funded researchers in response to the NIH voluntary policy demonstrated the need for a mandatory policy<sup>iv</sup>. This was also exposed in a 2005 survey of UK researchers, which found that about 15% of authors were willing to self-archiving in a repository on a voluntary basis, but 95% indicated that they would self-archive if their institutions and/or funders mandated it.<sup>v</sup>
- **Versioning:** Public access policies should require that researchers deposit the author's final version after peer-review has been completed and provide detailed information where the manuscript will be published (including persistent identifiers such as URN, DOI). This is the version that users need in order to learn accurately about the results of the research, and this is the version that belongs in the permanent archive. Currently, according to the SHERPA-ROMEO service in the UK, 63.2% of journals already allow the author's final version to be made open access.<sup>vi</sup> These include major commercial publishers such as Elsevier, and many of the large society publishers. Research funding agencies have a central role in determining publishers' policies and these numbers are likely to increase if more funding agencies require that final authors versions of papers to be archived. Currently, published versions and author manuscripts are usually in PDF formats (which is non-proprietary format since 2008 as already noted by other contributors in this forum). Proprietary formats reduce the usability of the papers and create a barrier to developing value added services. The ideal long-term storage format is open standard, meaning the specification is freely available and implementable.<sup>vii</sup>
- **Timing:** Policies should require that articles be deposited immediately upon publication, and made accessible within a 6-months of publication. The optimal scenario is that papers are made available immediately upon publication. However, in general a 6-month delay is acceptable in order to allow publishers maintain a revenue stream for their journals. A delay of access beyond 6 month would decrease the value and impact of the public access policy.<sup>viii</sup>
- **Ease of compliance:** Complying with a public access policy should not be onerous for authors. Repositories can assist with deposit and much of the deposit procedures can be automated. For example, the SWORD protocol has developed a standard deposit mechanism that could be used for to simultaneous deposit into repository and publisher.<sup>ix</sup> In addition, most repositories have the ability to embargo access for a given length of time.

## Features and Technology

The continually expanding global network of open access repositories now numbers over 1500 worldwide<sup>x</sup>. These repositories are the instruments by which research articles should be publicly archived and made available. Repositories are usually managed by research and higher education institutions and offer a permanent and trusted location for the corpus of scholarly literature in a digital environment.

Repositories currently adhere to an internationally agreed upon set of technical standards (OAI-PMH) by which they expose the metadata of their content making them 'interoperable'. We envision a corpus of open access content upon which value added services can be built (commercial or non-commercial). Examples of these services are: text mining, citation and usage services, or curated special collections. For this to occur, the content within must be free of licensing conditions attached and available in non-proprietary formats.

## Management

Based on the previous experiences of other agencies around the world, we maintain that the following components are necessary to ensure compliance:

- **Policies must be mandatory.** The very low deposit rates of NIH funded researchers in response to the NIH voluntary policy demonstrated the need for a mandatory policy<sup>xi</sup>. This was also exposed in a 2005 survey of UK researchers found that study which found that about 15% of authors are self-archiving voluntarily, but 95% indicated that they would self-archive if their institutions and/or funders mandated it.<sup>xii</sup>
- **Policies must be monitored for compliance.** Compliance with a public access policy should be attached to any future funding decisions. There are ways of monitoring this, through the use of grant numbers inserted into the metadata of the deposited papers. Grant numbers would then be searchable and granting agencies would hypothetically be able to glean other valuable information related to funding decisions.
- **Policies should be consistent across agencies.** Researchers are often funded through multiple research agencies. In a global research context, it is increasingly problematic to have a wide variety of access policies with differing requirements of researchers. A consistent, nation-wide approach would cut down on confusion and greatly improve compliance levels. In addition, a uniform nation-wide approach to public access policies in the US would also be helpful for publishers in developing more consistent self-archiving policies.

In conclusion, we believe that current research dissemination practices do not adequately meet the needs of all stakeholders – especially the public who has funded much of this research through taxes. Millions of policy makers, clinicians and practitioners, small businesses, students and educators, patients and their families, and others are without ready or affordable access. With the Internet comes the opportunity and the imperative to share these results widely so all citizens can access, use and build upon research results in new and innovative ways.<sup>xiii</sup> In addition, economic analyses have shown that an open access system as a whole would also cost less than the current subscription-based system in the UK. A study conducted by Houghton et al. concluded, for example, that, "(s)haring research information via a more open access publishing model would bring millions of pounds worth of savings to the higher education sector as well as benefiting UK."<sup>xiv</sup> Presumably, the savings of open access in the US would be even greater.

We appreciate the opportunity to comment and would like to thank you again for initiating this very important consultation.

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<sup>i</sup> According to the Association of Research Libraries (ARL), the average cost of a serial subscription for ARL member libraries increased by 315% from 1989 to 2003. This increase far exceeds the rise in the Consumer Price Index of 68% for those years. From 2003 on, average journal prices have increased more slowly, but still continue to rise by about 9% a year. Journal Economics: A Turning Point: <http://www.acrl.ala.org/scholcomm/node/9>

<sup>ii</sup> UNESCO's Approach to Open Access and Public Domain Information: [http://portal.unesco.org/ci/en/ev.php-URL\\_ID=8439&URL\\_DO=DO\\_PRINTPAGE&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=8439&URL_DO=DO_PRINTPAGE&URL_SECTION=201.html)

<sup>iii</sup> <http://www.sherpa.ac.uk/juliet/index.php?sortby=country>

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- <sup>iv</sup> National Institutes of Health. Public Access Working Group Report, 2009.  
[http://www.nlm.nih.gov/od/bor/workgroup\\_roster.html](http://www.nlm.nih.gov/od/bor/workgroup_roster.html)
- <sup>v</sup> Swan, A. and Brown, S. (2005) Open access self-archiving: An author study.  
[<http://eprints.ecs.soton.ac.uk/10999/>]
- <sup>vi</sup> <http://romeo.eprints.org/stats.php>
- <sup>vii</sup> <http://www.rsp.ac.uk/pubs/briefingpapers-docs/technical-preservformats.pdf>
- <sup>viii</sup> In the case of Humanities and Social Sciences some funders allow a delay of up to 12 months. This may prove necessary for special types of publications (such as books) or for a transitional phase. Compare for example the Open Access Pilot of the European Commission and the European Research Council (ERC),  
<http://www.openaire.eu/>
- <sup>ix</sup> <http://www.ukoln.ac.uk/repositories/digirep/index/SWORD>
- <sup>x</sup> <http://www.opendoar.org/find.php>
- <sup>xi</sup> National Institutes of Health. Public Access Working Group Report, 2009.  
[http://www.nlm.nih.gov/od/bor/workgroup\\_roster.html](http://www.nlm.nih.gov/od/bor/workgroup_roster.html)
- <sup>xii</sup> Swan, A. and Brown, S. Open access self-archiving: An author study. 2005,  
<http://eprints.ecs.soton.ac.uk/10999/>
- <sup>xiii</sup> Text adapted from the Open Access Scholarly Information Sourcebook:  
[http://www.openoasis.org/index.php?option=com\\_content&view=article&id=547&Itemid=265](http://www.openoasis.org/index.php?option=com_content&view=article&id=547&Itemid=265)
- <sup>xiv</sup> Houghton, John, Bruce Rasmussen, Peter Sheehan, Charles Oppenheim, Anne Morris, Claire Creaser, Helen Greenwood, Mark Summers and Adrian Gourlay. Economic Implications of Alternative Scholarly Publishing Models: Exploring the costs and benefits. JISC, January 27, 2009.  
<http://www.jisc.ac.uk/publications/publications/economicpublishingmodelsfinalreport.aspx>



## THE RIGHT TO RESEARCH COALITION

### **Introduction**

The Right to Research Coalition is an organization of local, national, and international student associations that advocate for governments, universities, and researchers to adopt more open scholarly publishing practices. In just over six months since its launch, our coalition has expanded to represent over six million students and continues to grow rapidly – a revealing testament to the profound impact that access to research, and often the lack thereof, has on the entire student community, undergraduates and graduates alike across all disciplines. Specifically, our members include the following organizations:

- American Medical Student Association
- California Institute of Technology Graduate Student Council
- Canadian Federation of Students
- Dartmouth College Graduate Student Council
- International Association for Political Science Students
- Library and Information Science Student Association, Simmons College
- Massachusetts Institute of Technology Graduate Student Council
- National Association of Graduate-Professional Students
- National Graduate Caucus of the Canadian Federation of Students
- Oberlin College Student Senate
- St. Olaf College Student Government Association
- The Student Public Interest Research Groups
- Students for Free Culture
- Trinity University Association of Student Representatives
- United States Student Association
- Universities Allied for Essential Medicines
- University of Minnesota Graduate and Professional Student Assembly
- University of Nebraska - Lincoln Graduate Student Association
- University of Tennessee - Knoxville Student Government Association

We would like to thank the Office of Science and Technology Policy for convening this public comment period on such an important issue. The Right to Research Coalition supports the adoption of a mandatory public access policy for all relevant federal agencies using the NIH public access policy as a model.

### **How do students interact with the current system of scholarly publishing?**

Quite simply, students rely on access to academic research for a complete education. Whether researching for a paper or delving more deeply into a given subject, scholarly journal articles provide students with a crucial level of detail. While textbooks and classroom instruction play an unquestionably critical role, it is often the very specific scholarly literature that clarifies crucial points and brings true focus to a student's understanding of a particular concept. Given this essential role, protecting and expanding students' access to this information is of utmost importance.

However, students' access to scholarly articles often falls short of their needs. Since no library can afford access to the entire scholarly record, nearly any student in higher education today can point to at least one instance (and more likely, a number of instances) in which they were not able to read an article that seemed to be exactly what they were looking for, forcing them to settle for an article that was available but not as relevant or up to date. With journal prices continuing to climb and library budgets feeling the full force of the current economic climate, students' access to scholarly research results is under more pressure than ever.

While it is important to ensure students have ready access to academic journal articles across all fields, journals in the areas of science, technology, engineering, and medicine (STEM) have the highest access barriers due to their often expensive subscription prices, especially relative to other fields of study. In these areas, it is not uncommon for journals to cost thousands of dollars per title annually, and sometimes reach well over \$20,000 per subscription per year. Given these costs, some students are already losing access to core titles with more students threatened everyday as subscription prices rise and budgets are cut. One such example is the University of Washington at Pullman's 2009 library budget cuts:

“Once again we have completed the difficult but necessary task of trimming our journal subscriptions in anticipation of a steep increase in costs. The

task grows more difficult each year since we are now losing access to core periodicals in some disciplines. Making the job even more difficult is the number of licenses we have that are part of multi-library contracts. In the near future, many of these deals, which have preserved our access to materials that we could not afford on our own, will be on the table for cuts. If we have to step back from these deals, there will be a dramatic decrease in our access to primary journals.”<sup>1</sup>

The range of scholarly articles that students get access to rests squarely on the number of journals their library can afford to purchase. The more money a school has to pay for subscriptions, the more access its students enjoy. The current system, with its significant price barriers, forces students at smaller and less financially robust schools to settle for the limited subset of journals their libraries can afford, hindering their education and putting them at a disadvantage relative to their peers at wealthier institutions. While most articles are available on a pay-per-article basis, the \$20 to \$30 per article fee effectively puts them out of reach for students who already struggle with high textbook prices and would not be able to tell if an article was even truly useful before purchasing it.

One set of students which suffers disproportionately under the current system is the nearly half of American undergraduates who attend community colleges.<sup>2</sup> While we lean on community colleges to provide the backbone of America’s technical labor force, we often fail to provide them with the most up-to-date technical literature. Community colleges generally provide a lower level of access to scholarly journals than their four-year counterparts due to their more limited budgets.

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<sup>1</sup> WSU Pullman Libraries Journal Cancellation Project Title Summary Calendar 2009, <http://www.wsulibs.wsu.edu/collections/CancelCover.html#topic4>

<sup>2</sup> AACC STATS: <http://www2.aacc.nche.edu/research/index.htm>

### **How would an NIH-style public access policy change this interaction?**

A mandatory public access policy across all federal science agencies would guarantee students access to a solid base of academic research, greatly expanding what is available today. While the adoption of a public access policy would not alleviate all of students' barriers to academic research, it would provide free access to a very significant portion of academic literature while sending a strong message to the rest of the scholarly communication community that openness is the new norm and likely eliminating more barriers in the process.

Today's students have grown up in a world of "on-demand" access to information, both at home and in the classroom. Yet when they reach the undergraduate and graduate levels, when such access is most important for their education and training for a future career, they face the steepest barriers to access. Expanding the NIH public access policy would be a very significant step in providing students with the on-demand access they need for a complete education.

Furthermore, a public access policy would help the students who need it most -- those at institutions that do not have the library budgets to afford the multimillion-dollar annual investment required to secure access to a significant portion of the scholarly record. For these students especially, public access will be crucial in securing the information required for their education and training. More broadly, articles made available by a public access policy will not supplant current journal collections, but rather will greatly enhance and build upon those resources that a student's institution is already able to provide.

### **What are the necessary features for a public access policy?**

A public access policy must be mandatory. Given the experience of the NIH and numerous other funding agencies with optional deposit policies, a mandatory policy is crucial to move from low compliance to the more than 60% deposit rate the NIH currently enjoys under its mandatory policy.<sup>3</sup>

Immediate access is preferable; access within six months is reasonable. When research is publicly funded, students deserve immediate access to the author's final manuscript. However, if an embargo period is deemed necessary, it should be kept as short as possible and should not exceed six months. Research is both most relevant and most useful when it is initially published, and given the short timeframe of a typical class – approximately four months – any delay in access will negatively impact students' ability to learn with the most relevant material.

Following the example of the Federal Research Public Access Act of 2009, we suggest that all federal agencies with an extramural research budget of \$100 million or more be included in any public access policy. Including all of these major federal agencies will ensure that students in every field of study get access to the relevant federally funded research.

The final published article is the preferred version, but the author's final peer-reviewed manuscript is an acceptable substitute. While making the author's final manuscript available may put two versions of a paper online, the manuscript can be linked to the publisher's version to prevent confusion, and the widespread practice of posting preprints of forthcoming articles demonstrates that making the author's manuscript available will not create confusion.

The policy should require articles to be posted in a fully accessible format, such as XML, that allows reuse and remixing as well as computational data-mining

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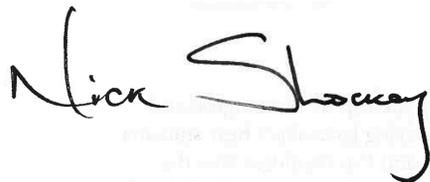
<sup>3</sup> NIHMS Monthly Aggregate Submission Statistics:  
<http://www.nihms.nih.gov/stats/index.shtml>

techniques. We stand to gain immensely from the hidden interrelationships between fields, which can often only be seen by computers sifting through thousands of articles for non-obvious connections and patterns.

## **Conclusion**

A mandatory public access policy with the characteristics described above would truly revolutionize students' access to the results of scholarly research. With such a policy, we could finally fully leverage the \$60 billion we spend annually on academic research grants and put into students' hands the information that they need to research, learn, and innovate, regardless of institutional size, type, or financial condition. On behalf of the six million students represented by the Right to Research Coalition, I thank the Office of Science and Technology Policy for convening and moderating this important discussion and urge the Obama Administration to implement the strong public access policy that our students deserve.

Sincerely,

A handwritten signature in black ink that reads "Nick Shockey". The signature is written in a cursive, slightly slanted style.

Nick Shockey  
Director, Right to Research Coalition  
<http://www.righttoresearch.org>  
[nick@arl.org](mailto:nick@arl.org)

21 Dupont Circle NW Suite 800  
Washington, DC 20036

Dr. John P. Holdren  
Director, Office of Science and Technology Policy  
Executive Office of the President  
New Executive Office Building  
725 17<sup>th</sup> St., N.W.  
Washington, D.C. 20502

January 21, 2010

Attn: Open Government Recommendations

Via E-mail: [publicaccess@ostp.gov](mailto:publicaccess@ostp.gov)

Dear Dr. Holdren:

I write in response to the request for input regarding enhancing public access to archived publications resulting from research funded by Federal science and technology agencies.<sup>1</sup> Wolters Kluwer Health (WKH) is a leading provider of information for professionals and students in medicine, nursing, allied health and pharmacy. WKH publishes over three-hundred periodicals, including journals for over sixty professional societies in twenty different medical disciplines.

Wolters Kluwer Health's Medical Research unit delivers electronic research information for medical and academic institutions and corporations for research and patient care, especially through its Ovid database system. WKH has invested millions of dollars in designing on-line digital archives and search functions to enhance the public's access to archived publications. WKH's innovative digital tools allow users to perform searches of archived journals, navigate, browse, immediately retrieve and print full text articles. WKH has innovated its software infrastructure to allow users to link instantly to other cited articles, export text to other databases and programs, and receive e-mail alerts when new journal issues are released. WKH has maintained and updated those tools as the needs and expectations of authors and users evolve. Verifying references and creating, managing and maintaining on-line links, providing coding for digital dissemination, integrating machine-readable tags, supporting reference linking and indexing, and otherwise enriching the content, design and functionality of on-line publications are all examples of the results of WKH substantial investment in the digitization of biomedical content.

President Obama has stated that for purposes of economic recovery and growth, "it's essential ...that we strengthen and reform our intellectual property system."<sup>2</sup> We could not agree with him more. However, a critical misconception appears to be underlying the

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<sup>1</sup> See 74 Fed. Reg. 65173 (December 9, 2009).

<sup>2</sup> See *Remarks of President Obama at Hudson Valley Community College* (September 21, 2009).

discussion on public access to research results. Free access advocates argue that taxpayers fund the articles, which, as you know, is simply not true.

Taxpayers fund the *research*. Taxpayers do not fund the peer-reviewing, selecting, revising and copy-editing of any subsequent article that may *reference* the research. When a researcher accepts a grant, he agrees to undertake the research, and write a report and/or summary. He could not commit to publish an article, because that is a highly selective, competitive proposition and being selected for publication is beyond the researcher's control. Private-sector editors make that decision, after reviewing hundreds of competing submitted manuscripts and managing the peer-review process. Publishers invest thousands of dollars *per published article* managing the peer-review, selection and copy-editing process, in part because high-quality journals reject so many submitted manuscripts. Rejection rates may be high because manuscripts do not sufficiently advance science, are not sufficiently unique, or are no longer timely, etc.

The current National Institutes of Health (NIH) policy inherently recognizes the value of that publisher expertise and investment. The NIH policy mandates that the final accepted manuscript – the *peer-reviewed* manuscript – be submitted, but only after being improved and validated by that publisher's expertise and investment. NIH could have instead required its funded researchers to submit the preprint manuscript that the researcher initially submitted to the publisher, before peer-review. Rather, it mandated that the researcher submit the version of the manuscript that has been accepted by the publisher for publication, after peer-review and after copyright has been transferred from the researcher to the publisher. Subsequently, NIH posts the peer-reviewed, copyrighted manuscript on a globally-accessible website, without any means to protect against piracy, which we already see occurring.

Protecting the copyright of these important works is essential to preserving incentives for private-sector investment in the peer-review, editing, and publishing of scientific research articles. We have serious concerns with the NIH mandatory public access policy. In addition to duplicating publisher services, this policy undermines intellectual property protections for copyrighted scientific research works and sets a troubling precedent for government taking of private-sector investments. Such policy is not an ideal model for subsequent initiatives for availing results of federally-funded research.

We therefore agree with the recommendation filed by the AAP in 2009 that a preferable way to enhance public access to the results of federally-funded research, while still preserving private-sector incentives to manage peer-review and perform copy-editing and digital archiving and search, is to make publicly available the reports and/or summaries of such research.<sup>3</sup> This approach, currently required for NSF-funded research in the America Competes Act, could be extended to all federal agencies that fund science and technological research. Not only does the America Competes Act require that reports be made public, but it requires that NSF post a link to the final published article on the NSF website.<sup>4</sup> The public therefore benefits from being able to link to the definitive published

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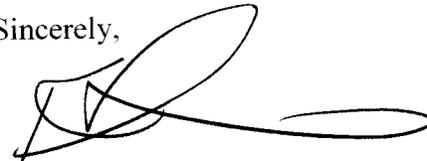
<sup>3</sup> See Letter from Alan Adler, Vice President AAP to Dr. Holdren, Director, OSTP (June 19, 2009).

<sup>4</sup> See Section 7010 of America Competes Act of 2007, codified at 42 U.S.C. Section 18620-2.

article after it has benefited from the publisher's copy-editing process, as well as any graphics and interactive web-based services coupled to the retrieval and review of the article. The America Competes model better balances the essential need to provide the private sector with incentives to invest in peer-review publishing and the goals of enhanced public access to research results.

Thank you for asking how publishers contribute to public access and what models may accommodate their needs. Heretofore, public policy has been adopted without appreciation of the value added by scholarly publishers to ensuring scientific integrity and progress. We look forward to working with you on realizing the President's goals to increase transparency and access to government data. As his remarks reflect, information products like scientific and medical articles are critical to an innovative economy. Publishers' incentives to produce such articles are essential for scientific advancement and must continue.

Sincerely,



Karen Abramson  
*President and CEO*  
*Wolters Kluwer Health Medical Research*

cc: Dr. Diane DiEuliis  
Assistant Director, Life Sciences  
Office of Science and Technology Policy



AMERICAN  
PSYCHOLOGICAL  
ASSOCIATION

January 20, 2010

Dr. Dianne DiEuliis  
Assistant Director, Life Sciences  
Office of Science and Technology Policy  
Executive Office of the President  
725 17<sup>th</sup> Street, NW  
Washington, DC 20502

**RE: Request for Public Comment on Public Access Policies for Science and Technology Funding Agencies Across the Federal Government**

Dear Dr. DiEuliis:

On behalf of the American Psychological Association (APA), we are pleased to respond to the Office of Science and Technology Policy (OSTP) notice in the December 31, 2009 *Federal Register* (Volume 74, No. 250) requesting public comment on "Public Access Policies for Science and Technology Funding Agencies Across the Federal Government." APA is the largest scientific and professional organization representing psychology in the United States and the world's largest association of psychologists with 150,000 researchers, educators, clinicians, consultants, and students. APA is also the largest publisher of behavioral science research, with 56 of the premier scholarly journals in the field of psychology.

Our association strongly supports the goal of enhancing public access to scientific publications. Accordingly, APA also endorses the guiding principles of "transparency, participation, and collaboration" that provide the cornerstone of the "Open Government Directive" that Office of Management and Budget Director Peter Orszag detailed in his December 8<sup>th</sup> memorandum to the heads of executive departments and agencies. The last line of this memorandum is particularly instructive for OSTP as it relates to the *Federal Register* notice on public access policies: "Moreover, nothing in this Directive shall be construed to suggest that the presumption of openness precludes the legitimate protection of information whose release would threaten national security, invade personal privacy, breach confidentiality, or damage other genuinely compelling interests." The future of scientific publishing should certainly be regarded as among these "genuinely compelling interests." Possible unintended consequences of public access policies include a reduction in the number of peer-reviewed journals, a shift toward "author pays" models of publishing, privileged access to publishing based on ability to pay, and commercial exploitation or re-use of content that is otherwise protected by the legitimate copyright and intellectual property interests of authors and publishers.

Given all that is at stake, we urge the federal government to refrain from mandating a public access policy that would apply across agencies without further study at a minimum. Such an

750 First Street, NE  
Washington, DC 20002-4242  
(202) 336-5500  
(202) 336-6123 TDD

Web: [www.apa.org](http://www.apa.org)



action would draw funds away from research and stifle innovation in a rapidly evolving industry. Publishers are currently engaged in and exploring a variety of approaches to increase public access to their publications, which include free access to abstracts with reasonable costs for the full article, free access for patients, and free access to developing countries. The National Institutes of Health (NIH) and the National Science Foundation (NSF) are implementing two very different public access policies. The NIH model requires all NIH-funded investigators to submit or have submitted for them an electronic version of their final, peer-reviewed manuscript resulting from NIH-funded research to PubMed Central to be made publicly available within 12 months after the actual date of publication. The NSF model requires NSF-funded investigators to submit their final project reports, citations of published research documents resulting from their research, and summaries of the outcomes of their research projects, and for these materials to be made publicly available in a timely manner and in electronic form through the NSF Web site.

In short, the federal government would be well advised to view this situation as a natural experiment with the benefits that it offers to evaluate the various public access models currently in place in both the public and private sector. This opportunity was clearly recognized by OSTP in the following statement in the *Federal Register* notice: "The NIH model has a variety of features that can be evaluated, and there are other ways to offer the public enhanced access to peer-reviewed scholarly publications. The best models may [be] influenced by agency mission, the culture and rate of scientific development of the discipline, funding to develop archival capabilities, and research funding mechanisms." The results of such an evaluative study would help to determine whether there is indeed a one-size-fits-all model of public access for federal agencies that would address the interests of key stakeholders, and if so, what the requisite features of such a model would be.

*We would now like to address the questions posed in the Federal Register notice that are of most interest to our association:*

**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?**

Federal agencies play a critical role in the development of scientific knowledge by supporting the conduct of research and the generation of research findings that are presented in manuscripts submitted for publication. Scientific publishers advance and disseminate scientific knowledge through their investment in a wide range of critical functions. These include editorial selection, peer review, copyediting, design production, marketing, distribution, and preservation. What at times is overlooked in discussions of public access is the value added by the publisher in the development of the peer-reviewed manuscript. This reflects years of investment in developing a journal brand recognized for its merit and standards of excellence in the scholarly community, the process of carefully reviewing articles for further consideration, the selection of peer reviewers, administrative management of the process, and editorial assistance to enhance the quality and readability of the manuscript.

It is important to note that the administration and infrastructure of the peer-review process, even with the reviews being conducted by volunteers, is a costly activity. These costs include

honoraria for editors and associate editors, salaries of manuscript coordinators, editorial office expenses, and programming and maintenance costs of the journal manuscript tracking system. On average, for every article that appears in an APA journal, there are five manuscripts requiring peer reviews. After peer review, the accepted manuscript then goes through a production process to make it ready for final publication. At present, the costs associated with peer review and publication production are offset by fees from licenses and subscriptions to APA publications and databases (mainly from libraries).

A viable public access policy must acknowledge that copyright protection extends to the entire work, including the peer-reviewed manuscript, when the author transfers the copyright to the publisher. Such a policy would retain financial incentives for publishers to invest in the scientific enterprise through peer review and the other vital functions related to journal production. Our overriding concern is that when peer-reviewed manuscripts are made widely and freely available on-line, the commercial value of the finished, published work is likely to be seriously diminished, with resulting declines in subscriptions and licensing agreements. This loss of income is likely to lead to less science publishing, and thereby, less public access to research findings.

APA and other publishers are engaged in efforts that promote public access to scientific publications, including in developing countries, that do not carry with them the type of unintended adverse consequences associated with some public access proposals. APA, through its own publishing program, and through partnerships with other publishers, provides state-of-the-art public access to scientific publications. For example:

- APA's PsycARTICLES Direct electronic product allows Internet access to a database of full-text articles from journals published by APA, the APA Educational Publishing Foundation, the Canadian Psychological Association, and Hogrefe Publishing Group. No fee is charged to search the electronic database, or to read and print the abstracts.
- APA participates as a publisher partner with the Health InterNetwork Access to Research Initiative (HINARI). Sponsored by the World Health Organization, HINARI ([www.who.int/hinari/about/en/](http://www.who.int/hinari/about/en/)) provides free or very low-cost online access to the major journals in biomedical and related social sciences to not-for-profit institutions in developing countries. HINARI includes over 2000 journals from 70 publishers.
- APA has entered into an agreement with the Wellcome Trust to make articles funded by the Trust publicly available on the Internet upon publication. The Wellcome Trust recognizes the significant costs for publishers associated with public access and has taken the financial responsibility to examine ways to help offset publication costs.
- APA provides the table of contents (ToC) for every issue of all of its journals, which is published on the APA Web site with links to each article's abstract. We also send e-mail alerts about those ToCs to anyone who signs up to receive them. The ToC with links remains posted on the Web until the journal's next issue is off-press and then it is replaced by the new one.

- APA's new Web site offers a state-of-the-art search engine, which allows visitors to search on a term (e.g., depression) and view results of relevant documents within APA's public content, as well as obtain free access to abstracts of articles within APA subscription databases. This new search feature provides public access to both the summarized psychological literature written for the lay public, as well as links to abstracts of the actual published research.

**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?**

There are many factors to consider in developing a public access policy (e.g., form of the research findings to be made available and length of embargo period), which are addressed in other questions. Yet, it is critical to also consider the economic impact of such a policy. A public access policy must not have a negative economic impact on publishers, either in this country or internationally, nor on U.S. business or industry, that would undermine our nation's high quality of research. This is likely to occur if publishers are required to forego their copyright interests without just compensation for their vital investments in the scientific enterprise. To address this concern, the public access policy could allow for the use of grant funds for the payment of publication fees, which is not standard practice for social and behavioral science publishing. (Historically, most social and behavioral science publishers have not assessed publication fees.) Alternatively, a federal agency could set aside funds to enter into direct licensing arrangements with publishers to deposit copyrighted work on behalf of authors as some other non-governmental funding agencies have done, such as the Wellcome Trust and the Howard Hughes Medical Institute.

**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 current users of peer-reviewed research publications are primarily academic researchers. They access these papers through direct or library journal subscriptions and through circulation of papers within the relevant scientific community. In our view, these papers are already easily accessible within the academic and scientific research communities. Increasing access to these papers to broader audiences would not increase their use among members of the general public, would not promote broader knowledge dissemination across the many fields of science, nor would it enhance the public's appreciation of the scientific research enterprise. As we suggest in addressing the next question, accomplishing those goals will require that papers be presented in different formats.

**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 wording of this question presupposes that peer-reviewed scientific papers are the appropriate research product to be made available to the public free of charge. As noted earlier, there is an essential distinction to be drawn between making research findings available and making available a peer-reviewed manuscript or the actual published version of the research investigation. The latter represents a value-added investment beyond that provided by the federal government and does not account for the interests of other possible non-governmental funders of the research. If it were deemed essential to select one public access model for government-wide dissemination, the NSF model would be the most viable since this model makes research findings freely available to the public in a timely manner through both project reports and summary documents, while providing ready access to the citations of publications resulting from the research. Each such deposited record could include a hyperlink to the publisher's own system for access to the final published version, along with a link to the author's Web site. Authors and publishers could be encouraged to produce two abstracts – one for a scientific audience and one for the lay public.

**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?**

In the best of all possible worlds, the definitive, publisher-authenticated version of a scientific paper would be made available under a public access policy to avoid compromising the quality of scientific publishing through access to other inferior versions. In the case of the NIH public access policy, for example, the peer-reviewed manuscript is made available, which has not benefited from the final copyediting, fact-checking, and proofreading required for formal publication. The integrity of scientific publishing will be severely compromised under public access policies that encourage multiple versions of the same paper being disseminated and circulated.

**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?**

The point in time at which the peer-reviewed papers might be made available to the general public will necessarily vary by scientific field and by the frequency of publication (whether weekly, monthly, or quarterly). For instance, some of the biomedical research society publishers will likely be able to collect sufficient fees during the 12 months between the date of publication and the posting of the manuscript to cover their expenses and thus sustain their publishing programs. Some of the more well-known journals (*Science*, *JAMA*, *New England Journal of Medicine*, and *Nature*) have either atypically high numbers of subscribers or large amounts of paid advertising from pharmaceutical companies and other commercial concerns. Many also assess submission and/or publication fees of various sorts to help underwrite their expenses. These journals also typically have a "shelf life," i.e., the lifetime usage or how long the article is used over time, for the science reported in their publication(s) that falls within a 12-month period (and often much shorter than that).

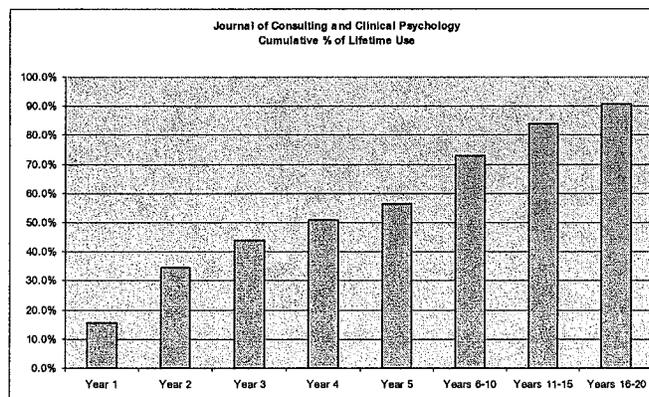
However, a 12-month shelf life is not the experience for the vast majority of publishers of social and behavioral science research and perhaps least of all for APA, which publishes mostly quarterly journals. The cutting-edge research in psychology that APA publishes is rarely obsolete within a year and may have a shelf life of 5 to 10 years, or more. Furthermore, only 16% of the eventual “lifetime” usage of APA journal articles—in the form of downloads—occurs within the first year after publication.

APA tracks the usage of individual journal articles and conducts annual data analyses on a journal-by-journal basis. Usage statistics are generated based on annual journal data and lifetime article data. APA’s PsycARTICLES full-text database is used to estimate the shelf life of an average journal article by examining downloads by copyright year.

The analysis of lifetime usage is conducted in two ways. First, individual articles are followed prospectively from their years of copyright forward. The ability to track download usage in this way is relatively recent and therefore does not allow the analysis to extend for more than five to seven years. A second method is therefore employed. This involves use of the APA full-text database, which includes the entire back-catalog inventory of APA journal articles. For a given year, download usage is computed retrospectively by computing current year usage stratified by year of copyright. This method allows the analysis to extend back in time for 20 or more years.

The following table and corresponding graph, based on this retrospective analysis, display electronic usage of an average article appearing in the *Journal of Consulting and Clinical Psychology*. This journal has one of the largest subscription bases and number of NIH-funded articles. These data show the percentage of articles downloaded in a given year with copyrights of that year (Year 1), the previous year (Year 2), and continuing retrospectively for 20 years (Years 16-20). Also provided is the cumulative percentage of “lifetime use,” defined as 90% of use.

Year	% in Year	% of Lifetime Use
1	15.4%	15.4%
2	19.0%	34.4%
3	9.3%	43.7%
4	7.2%	50.9%
5	5.4%	56.3%
6-10	16.4%	72.7%
11-15	11.2%	83.9%
16-20	6.8%	90.7%



The data for this one journal mirrors the experience across all of APA’s 56 journals. The basic pattern of lifetime usage in a given year is as follows: 16.3% in the initial year of copyright, 17.8% in the second year, 9.5% in the third year, 7.3% in the fourth year, 4.5% in the fifth year, 17.0% in years 6-10, 10.5% in years 11-15, and 7.3 percent in years 16-20. The basic pattern of cumulative lifetime usage across all APA journals is: 16.3% in the first year, 34.1% in the second year, 43.6% in the third year, 50.9% in the fourth year, 55.5% in the fifth year, 72.5% in years 6-10, 83.1% in years 11-15, and 90.4% in years 16-20.

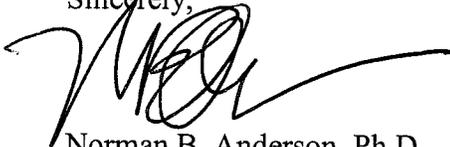
These data demonstrate that articles published in APA journals have a half-life and lifetime usage of about 4.5 and 19.5 years, respectively. Because life-time utilization of APA journal articles occurs over a long period of time, a public access policy with an unduly restrictive embargo period (such as the 12 months under the NIH policy) can be expected to have a significant, adverse impact on APA journals and all other journals with similar usage patterns.

**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 to be given the opportunity to comment or provide feedback?**

To make federally supported research more widely available to the general public, science writers should be enlisted to create public information materials that summarize a body of research for the general public or outline a series of research findings across areas through periodic communications (e.g., daily press releases, weekly news alerts, and monthly newsletters) written for the public on the results of federal agency-supported research. These could be made accessible through Web sites, radio, television, newspapers, and magazines.

In closing, the American Psychological Association appreciates the opportunity to respond to this request for public comment on the topic of public access policies for science and technology funding agencies across the federal government. The scientific publishing community is dedicated to the widespread dissemination of scientific research and looks forward to working with OSTP and other federal agencies to ensure that the goal of enhancing public access is achieved and that the scientific publishing industry is preserved in the process. For any additional information or assistance, please contact Dr. Ellen Garrison, APA's Senior Policy Advisor, at (202) 336-6066 or [egarrison@apa.org](mailto:egarrison@apa.org).

Sincerely,



Norman B. Anderson, Ph.D.  
Chief Executive Officer



Gary R. VandenBos, Ph.D.  
Publisher



Elsevier submission to Office of  
Science and Technology Policy public  
consultation on Public Access Policy

January, 2010

## INTRODUCTION

Elsevier is a publisher of scientific, technical, and medical (STM) research and reference information that was founded in 1880. Elsevier has a considerable presence as an established and integral contributor to the scholarly research community in the United States. Our US workforce comprises nearly 3,000 members spread across more than 15 offices in 10 states. Annually, we publish around 260,000 journal articles, many of which are authored by US researchers and of which approximately 35,000 acknowledge support from the US government. In addition, we publish over 250 journals in partnership with US scholarly societies, such as American College of Cardiology, American College of Surgeons, and American Academy of Otolaryngology – Head and Neck Surgery. There are over 3,000 researchers in the US whom we engage as editors and reviewers for our more than 2,000 journals. Finally our research information solutions and services reach over 10 million researchers in over 3,000 research and medical institutions globally.

Elsevier welcomes the opportunity to comment on the OSTP Request for Public Comments and appreciates the opportunity to respond to the US government’s open consultation with stakeholders.

STM publishers such as Elsevier have deep and well-established partnerships with the US research community and are essential stakeholders in the system of STM communications. Our comments are primarily concerned with STM journal publishing, which is the primary mechanism by which scientific and medical research results are formally certified and disseminated.

Through this formal submission, we first provide an executive summary of our key perspectives before secondly discussing those points in more detail. Thirdly, we respond to the specific questions posed by the OSTP.

### A. EXECUTIVE SUMMARY

- Society depends on today’s well-functioning system of STM communications that sustainably delivers extremely broad access and strong quality controls. STM publishers are custodians of this system today because of the essential role that they play in the communication of scientific, technical and medical research results.
- Elsevier supports the view that government should be guided by “the principles of transparency, participation and collaboration” as noted in the Open Government Directive.
- Elsevier supports the notion that taxpayers should have access to the outputs of taxpayer-funded research, and that the government should ensure access to such outputs. However, such outputs are not and should not be confused with the outputs of the STM publishing process.
- Taxpayers fund research but they do not fund the publication of research. Therefore, government should not impose mandates that pertain to outputs of the publishing process, including accepted author manuscripts and published journal articles. Such policies would not be justifiable or warranted, and would result in a government’s “taking” of private sector products.
- Government-imposed public access policies would violate fundamental copyright principles by allowing the government to diminish existing copyright protections for private sector journal articles.
- Any effort by government to establish policies in this area should be done in consultation with all affected stakeholders, ensuring that such policies do not undermine the sustainability of the peer review publishing system which is necessary to ensure the quality and integrity of scientific research.
- The government should consider the National Science Foundation public access approach in the America COMPETES Act as a model for other agencies.

## B. STM PUBLISHING, GOVERNMENT FUNDED RESEARCH AND PUBLIC ACCESS

**1. Society depends on today's well-functioning system of STM communications that sustainably delivers extremely broad access and strong quality controls. STM publishers are custodians of this system today because of the essential role that they play in the communication of scientific, technical and medical research results.**

### The role of STM publishers

STM publishing is a dynamic, finely-balanced, high quality global system that works well. There are around 2,000 STM journal publishers worldwide—including large commercial, small commercial, university presses and learned societies. These companies co-exist in a network that annually produces around 1.5 million peer-reviewed articles in some 23,000 journals. The STM publishing industry employs over 30,000 people in the United States and around 110,000 globally, constituting a highly educated and skilled employee base of knowledge workers.

STM publishers play an essential role in the communication of research results by:

- Identifying and supporting new areas of research by establishing new journals and developing communities around such journals.
- Establishing and developing the editorial perspective and scope for each of the existing 23,000 journals and creating the reputation and brand to attract author's manuscript submissions to the "right" journal in highly focused fields of research.
- Managing the appointment of journal editors and the ongoing development of journal editorial boards to ensure the proper editorial perspective, authority and responsibility to the scientific discipline and readers.
- Establishing and maintaining sophisticated systems to manage the processing of some 2-3 million manuscripts submitted from researchers around the world annually ("preprints").
- Organizing, managing, and financially and technologically supporting the peer review of submitted pre-prints, a labor-intensive globally-dispersed process that results in some 1-2 million "accepted author manuscripts" annually, and that is the primary mechanism to ensure the veracity and to improve accounts of new research. Peer review, the process of subjecting an author's scholarly manuscript to the scrutiny of highly qualified experts in the same field prior to publication in a journal, is widely supported by the academic community. In a recent study, 85% of researchers agreed that peer review greatly helps scientific communication and 90% said that it improves the quality of the published paper<sup>1</sup>.
- Managing the communication of peer review results with several million globally dispersed authors annually.
- Soliciting, editing and preparing for production some 1-2 million manuscripts that are accepted for publication by copyediting, proofing, formatting, branding, paginating, adding metadata and identifiers, checking and enhancing artwork quality, converting files, data and artwork to XML, and adding links to ensure interoperability using industry standards like CrossRef<sup>2</sup>.
- Producing some 1.5 million final "published journal articles" each year, and disseminating them globally both in print journals and online electronic journal platforms to tens of millions of researchers and members of the public.
- Archiving journal volumes and promoting their use in perpetuity, "future-proofing" against developments such as electronic document file format changes through arrangements with partners such as national libraries and Portico<sup>3</sup>.
- Ensuring the integrity of the published scientific record against plagiarism, distortion, and mutilation. For example, publishers regularly add errata or notices to articles and (on rare occasions) remove

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<sup>1</sup> Publishing Research Consortium (2007) "Peer Review in Scholarly Journals: perspective of the scholarly community. An international study."

<sup>2</sup> CrossRef was founded in 2000 and is a collaboration of scholarly publishers including more than 2,600 participating publishers, 700 member publishers and 1,500 library affiliate members (see <http://www.crossref.org>). It has developed a journal reference linking service that functions as a digital switchboard for access to bibliographic data on over 33 million journal articles. The CrossRef database contains essential article metadata supplied by participating publishers which allows researchers to search and link articles through a digital mechanism (CrossRef Digital Object Identifiers or "DOIs") that identifies and connects each individual article.

<sup>3</sup> Journals preserve the scientific record for future generations of researchers to build on. Professional publishers and libraries create and archive over one million peer reviewed journal articles every year. Over the last hundred years they have digitized and archived over 35 million articles, and these continue to be available for use today. At current growth rates a further 50 million articles will be added in the next 25 years. Publishers have organized and licensed well-established organizations such as the Koninklijke Bibliotheek (the Royal Library of the Netherlands, The Hague) and Portico to provide digital archival support for researchers and library customers.

articles from the scientific record. CrossCheck, a system developed by the STM publishing industry, has also been developed to detect and address plagiarism of manuscripts.

### The E-revolution in STM publishing

Within the last decade, the STM industry has undergone a dramatic digital revolution because it invested heavily to drive a format shift of published research from being fully print only to being one in which the majority of customers receive their content either only electronically (“E-only”) or in addition to print (“Electronic plus Print.”) For example, in 1999, 100% of Elsevier’s journal revenue came from print sales. Today, less than 20% of Elsevier’s journal revenues are from print sales, while more than 80% are from “E-only” and “Electronic plus Print” sales.

This digital revolution is continuing to deliver the following massive benefits to STM communities:

- i. Since 1999, there has been a dramatic increase in access levels for both researchers and the public .
  - STM researchers now have extremely widespread access to journals: a recent study showed that 94% of university and college-based respondents found access to information “very easy” or “fairly easy”, and access to journals is 14th on their list of concerns (lack of funding is number one; too much paperwork is number five)<sup>4</sup>.
  - ScienceDirect, Elsevier’s online journal platform, is used by around 14 million researchers globally. It hosts 10 million articles dating back to the 1820s and now has close to 600 million full text article downloads per year, approaching 2 million article downloads globally per day.
  - Researchers now have access to significantly more content than they did in the print-only era: researchers now read from 25% more journals than in the mid-1990s and university faculty are reading 34% more articles<sup>5</sup>.
  - Public access has also expanded dramatically due to initiatives that STM publishers have led in collaboration with others to broaden access for researchers in developing countries, patients, the public and disabled persons. For example:
    - Research4Life is a public-private United Nations initiative that makes thousands of STM journals available to over 5,000 institutions in over 100 developing countries at no or low cost. In 2009, Elsevier alone had more than 2.5 million articles downloaded as part of Research4Life initiatives.
    - Publishers, including Elsevier, have created PatientINFORM in partnership with key medical associations including the American Cancer Society, the American Heart Association, and the American Diabetes Association. PatientINFORM is a public health literacy project that provides patients and caregivers with a free online resource of interpreted, packaged, and up-to-date research about specific diseases that is based upon recently published journal articles.
    - Elsevier has also created Patient Research, which gives patients and their family members desktop access to articles in 100 medical journals for a processing fee of less than \$5 per article.
    - Elsevier’s “walk-in” clause enables libraries licensing ScienceDirect to give any member of the public free electronic on-site access to any journal article licensed by a library. Other publishers have similar programs.
    - Access for visually impaired persons (VIP) has also been increased as publishers have voluntarily implemented “read aloud” software for online sites.
- ii. Since 1999, researchers’ productivity has increased dramatically.
  - Cross-publisher initiatives enable researchers to click seamlessly from one article to another, for example by clicking on cited references.
  - Publishers have taken major steps to ensure that their published articles are accessible from “one stop shop” starting points such as third party search engines. For example millions of Elsevier articles, including all newly published articles, are “deeply indexed” and accessible by Google, i.e. their full text has been indexed by the search engine to enhance their discoverability globally.
  - Other initiatives have also improved productivity, such as the ability to link directly to an article’s associated experimental data set.

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<sup>4</sup> Ware, Mark. “ Access by UK small and medium-sized enterprises to professional and academic information,” Mark Ware Consulting Ltd for Publishers Research Consortium (April 2009)

<sup>5</sup> Dr. Carol Tenopir, “How Electronic Journals are Changing Reading Patterns”, April 2007.

- As a result of such developments one key study showed that between 2001 and 2005 scientists and engineers were the only professional group whose productivity actually increased because they spent less time gathering information and more time analyzing it<sup>6</sup>. In all other fields, knowledge worker productivity declined.
- iii. The effective prices paid per journal and per article have fallen considerably.
- Publishers' electronic licensing deals have developed so that most libraries now receive substantial volume discounts. Through these so-called "Big Deals" libraries can license access previously unsubscribed titles at a fraction of the listed subscription price. As a result, libraries now access more titles but pay less per title than they did several years ago.<sup>7</sup>
  - As the effective price paid per journal accessed has decreased, the number of journals accessed has increased, and the usage of those journals has grown by over 20% per year. Consequently, the average effective price paid per article downloaded has fallen from \$15 in 1999 to below \$2 an article today.
- iv. So far STM publishers have been able to deliver these benefits sustainably, without compromising the excellent standards of quality control and preservation.
- Throughout this E-revolution, STM publishers have been highly effective in protecting the quality and integrity of research and continue to invest in mechanisms to improve quality and standards further such as via electronically enabled peer review systems. Elsevier alone has invested tens of millions of dollars in creating, maintaining, and improving its electronic peer review/editorial system.

## **2. Elsevier supports the view that government should be guided by "the principles of transparency, participation and collaboration" as noted in the Open Government Directive**

Elsevier agrees that "Collaboration improves the effectiveness of Government by encouraging partnerships and cooperation within the Federal Government, across levels of government, and between the Government and private institutions." The STM publishing system represents and embodies these very same principles. The government contributes funds for research. Researchers and their institutions then provide the facilities and knowledge to support research and informal communications. Finally, publishers create and manage the formal and value-added system of scholarly communication via STM journals. This system of STM journals places such research into context, assists in its validation, ensures its quality and integrity through coordination and management of the peer review process, indexes and highlights important research, and distributes and preserves the scientific record.

However, it is important to distinguish between supporting initiatives that will promote transparency and open government, and government mandates that will result in the "taking" of private sector products.

## **3. Elsevier supports the notion that taxpayers should have access to the outputs of taxpayer-funded research, and that the government should ensure access to such outputs. However, such outputs are not, and should not, be confused with the outputs of the STM publishing process.**

Government, through its funding agencies, supports the research enterprise which generates outputs such as experimental data, technical reports, grant reports, and conference papers. Consequently, government has an important interest in ensuring that experimental data, technical reports and grant reports are accessible to the public whose taxes funded their production. Researchers and their institutions such as universities also have an interest in such material, and their contributions should be identified and recognized.

Elsevier supports the notion that taxpayers should have access to the outputs of taxpayer-funded research, and that the government should therefore ensure access to such outputs. Elsevier would support government requiring that research outputs such as experimental data, technical reports, grant reports, and conference papers be posted online and made freely accessible.

<sup>6</sup> Outsell I-Market Hot Topics, vol 1, May 6, 2005: "2001 vs 2005, Research study reveals dramatic changes among information consumers"

<sup>7</sup> LISU Annual Library Statistics : <http://www.lboro.ac.uk/departments/lis/lisu/pages/publications/>

Indeed, a policy supporting broader access to such outputs would also meet a clear need: independent research shows that while access to journal articles is not a barrier to effective research, access to research outputs such as experimental data, technical reports, grant reports, and conference papers could be improved.<sup>8</sup> Similarly the 2006 Audit of Interest Study by the National Science Foundation (NSF) Office of Inspector General determined that short summaries of results and publication citations were the preferred form of research results that the public would like to access. The NSF has embodied these same preferences in its current obligations under the America COMPETES Act. Under the Act, NSF-funded researchers are required to post summaries of final project reports online.

In addition Elsevier, like nearly all journal publishers, also permits authors to post online at any time the preprints that they have submitted to a journal (i.e. manuscripts prior to peer review). There are some exceptions for a very small number of journals that publish frequently and that perform a “news-breaking” function. Certain research communities have relied on such policies to develop their own informal systems for communicating unpublished research results. The most notable preprint repository is arXiv which is a forum allowing physicists to share conference papers and preprints. Computer science and economics disciplines have also been proactive in sharing their informal research outputs online. To help foster the exchange of conference papers, Elsevier has developed “Procedia” on ScienceDirect, a collection of published conference papers that are freely available to the public.

The above are examples of unpublished or informal research outputs. However, they are not and should not be confused with outputs of the publishing process, which have subsequently had value added to them as the result of the editorial oversight and investments of publishers.

**4. Taxpayers fund research but they do not fund the publication of research. Therefore, government should not impose mandates that pertain to outputs of the publishing process, including accepted author manuscripts and published journal articles. Such policies would not be justifiable or warranted, and would result in a government’s “taking” of private sector products.**

Unlike scientific and medical research itself, the *publication* of scientific and medical research is not funded directly by taxpayer dollars. While accepted author manuscripts and published journal articles are *based on* preprints that are submitted to journals, they are also differentiated from them by the value-adding activities that publishers contribute and invest in, not through the activities of government-funded research.

STM publishers employ highly skilled “knowledge workers” with significant knowledge of the underlying areas of research and the respective research communities. Many are former researchers or practitioners themselves. These skill sets enable publishers to anticipate the needs of researchers and to participate in the formal communication system, often working collaboratively with university faculty and researchers at research institutions who serve as editors and reviewers.

STM publishers incur significant ongoing capital investments and operating expenses to perform the value-adding activities described above in section B1. Elsevier alone has invested hundreds of millions of dollars to digitize its STM submission, peer review, production, dissemination and archiving processes. Other publishers have made similar up-front investments. These are not and have not been paid by taxpayer dollars, but by publishers who then recoup their investments via a combination of revenue sources such as subscription-based fees for institutional and individual licenses, transactional ‘pay-per-view’ fees, and commercial sponsorship and advertising.

The primary source of revenue that for hundreds of years has sustained the STM publishing system by enabling publishers to recoup their investments is subscriptions. Indeed it is the global system of predominantly institutional subscriptions that has enabled over 96% of scientific articles to be made available electronically to over 10 million researchers who account for 3 billion downloads growing at double digit rates annually.

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<sup>8</sup> In a recent PRC study (Access by UK small and medium-sized enterprises to professional and academic information, 2009), respondents were asked to say which one of the important but hard-to-access information types they would like to see improved. For university/colleges the two most frequent responses were conference proceedings (22%) and doctoral theses & dissertations (21%).

The ability for publishers to charge subscriptions to recoup the investments that they make in value-adding publishing activities would be significantly if not completely compromised if duplicate versions of their content were freely available elsewhere, such as via government-mandated posting of accepted author manuscripts in publicly accessible databases as is the case for the NIH Public Access Policy.

Therefore, the government should not mandate that outputs of the publishing process, including accepted author manuscripts and published journal articles, be made freely available. First, the government does not have the right to appropriate outputs of the private sector investments without appropriate compensation. This would constitute a government “taking” of private-sector products. Second, any such policy could destabilize the dynamic and well-functioning STM publishing system upon which researchers and society depend, and thereby cause serious albeit unintended consequences. Third, such a policy would not achieve any significant benefits because researcher and public access is now extremely broad. Finally, as discussed below, such actions would violate fundamental copyright principles.

#### **5. Government-imposed public access policies would violate fundamental copyright principles by allowing the government to diminish existing copyright protections for private sector journal articles.**

For over a century, copyright protection has provided the incentive for publishers to invest in the peer-review of research prior to publication and in the infrastructure necessary to publish and distribute scientific journal articles about the latest government-funded research. Publishers have depended on copyright to protect these works that have aided in the advancement and integrity of science and contributed to substantial gains in biomedical research and other knowledge.

In effect the application of government mandates like the NIH Public Access Policy—whether cloaked in the guise of funding, appropriations, or other policy—is indistinguishable from the imposition of an extraordinary and unprecedented exception to the most fundamental of rights under copyright—namely, the exclusive right to distribute the copyrighted work. While the government may have funded the research, or some of it, it should not claim fundamental rights in the research works that reflect substantial value added by publishers. Nor for that matter should the government claim fundamental rights that belong to authors in the drafts of papers to be submitted to journals.

Government agencies might attempt to trump copyright through blanket requirements in grant contracts that would essentially force authors and publishers to, in essence, forfeit their copyrights—without compensation for publishers’ investments. This type of government action might lead agencies to claim that taking and distribution of the copyrighted articles is consistent with copyright law. But it is not consistent with copyright principles which, among other things, are meant to prevent harm to the potential market for copyrighted works. Harm would be realized if freely available substitute versions of copyrighted works were distributed worldwide in competition with the rightsholders’ copyrighted works.

#### **6. Any effort by government to establish policies in this area should be done in consultation with all affected stakeholders, ensuring that such policies do not undermine the sustainability of the peer review publishing system which is necessary to ensure the quality and integrity of scientific research.**

Elsevier believes that government intervention in STM publishing would be inappropriate, unnecessary and unwarranted. However, in the case that the government does create policies to promote public access to government-funded research, formulation of the policy should uphold the following clear principles:

- i. The government should work in full and open consultation with all vested stakeholders. It should define clear measurable goals and objectives, such as by quantifying current and future access levels, taking into account key differences in publishing dynamics across subject disciplines.
- ii. The government should proceed with extreme caution.
  - While it is possible to adjust cautious policies over time once evidence has been gathered, policies implemented without due caution could cause irreversible damage that could not be undone with subsequent policy adjustments.

- There are clear examples of harm that have occurred or will occur to the publishing industry as a result of unrefined open access policies.
    - Studies have indicated that making journal articles freely available after an “embargo period” from the date of the article’s publication could lead to increased subscription cancellations.
      - One study found that with a twelve months embargo, even if only 40% of a journal’s content was made available for free, 44% of librarians said they would stop subscribing because they could get enough content for free.<sup>9</sup> Another study also found that librarians would cancel subscriptions if journals are freely available at 6 months or 12 months<sup>10</sup>.
    - Oxford University Press experienced subscription decline when it experimented with free access to its journal articles after 6-months.
  - Furthermore, it may take years for more widespread harm and unintended consequences to be realized. The newspaper industry’s free to online users model is now viewed as widely and irreversibly unsustainable, although it took several years for this to become apparent. Over 140 newspapers, which like journals in research communities serve as archives of the historical record for many local communities, have folded their operations in the US since 2007. From 2006 to 2009, daily newspaper usage dropped by 20%<sup>11</sup> and total news revenue fell by 26% from \$134 billion to \$100 billion<sup>12</sup>. Around 31,000 jobs have been lost in the US newspaper industry as it has contracted and rationalized in the last two years. Society and the science and medical research communities on which it depends cannot afford for the STM publishing community to experience a similar outcome.
- iii. The government should fund the publishing activities of any publishing outputs that it seeks to make freely available.
- The government should compensate the private sector if it intervenes, competes with, or takes actions that have the potential to undermine publishing markets and business models.
  - For example, some research funding bodies have provided funds to broaden access to published research outputs, notably the Wellcome Trust, the Howard Hughes Medical Institute (HHMI), and the British Heart Foundation.
- iv. The government should be evidence-based taking account of key differences across subject disciplines and should not pursue “one-size-fits-all” policies across subject disciplines.
- The government should be careful not to prematurely evaluate the NIH Public Access Policy and should not generalize the effects of a policy for biomedical sciences to other disciplines.
    - The NIH policy has only been mandatory since April 2008 and allows a 12 month embargo period for posting of manuscripts to PubMed Central (PMC). Therefore, journals with high percentage of articles reporting NIH funded research may yet to have a large percentage of their content made freely available on PMC.
    - It cannot be determined that the NIH policy has not nor will not negatively affect these journals by resulting in loss of usage and subscriptions. Library journal selections are typically made annually based on previous year usage of the journal on publisher platforms. It is too early to determine if posting of manuscripts on PMC will result in a decline in usage on publisher platforms that in turn will lead to journal cancellations.
    - Finally, the NIH policy primarily applies to biomedical sciences which are fast moving disciplines. A 12 month embargo period may be highly detrimental to journals in other disciplines.
  - Each discipline is unique in how it carries out its research and communicates its results and therefore the government should not pursue “one-size-fits-all” policies across subject disciplines.
    - Disciplines vary greatly in how quickly and often they download and “use” the final published article. “Usage curves” shows how quickly an article’s lifetime usage occurs, and how this varies by discipline. If articles are made freely available too early – which could be 24 months in certain scientific fields – the result could be widespread subscription cancellations because the majority of users would wait to access and use the freely available version of the article.

<sup>9</sup> “Self-Archiving and Journal Subscriptions: co-existence or competition? An international survey of librarians’ preferences”. Scholarly Information Strategies Ltd. for the Publishing Research Consortium, November 2006.

<sup>10</sup> “ALPSP survey of librarians on factors in journal cancellation”, Mark Ware Consulting Ltd for ALPSP, March 2006.

<sup>11</sup> “News Users 2009”, Outsell Inc., December 2009.

<sup>12</sup> “News Providers and Publishers: 2009 Market Forecast and Trends Report”, Outsell Inc., October 2009.

- Physicists, economists, and computer scientists often share and post preprints and conference papers, whereas life scientists do not.
  - Life scientists often cite many previous studies in their reference list, but chemists rarely do so.
- Similarly, each journal is unique in terms of its breadth of subscriber base (large vs. small, institutions vs. individuals), its revenue mix (e.g. subscriptions vs. advertising), its publication frequency (weekly vs. monthly vs. quarterly) and its usage over time (long vs. short “half-life”) . Therefore the government should not pursue “one-size-fits-all” policies across journals.

**7. The government should consider the National Science Foundation public access approach in the America COMPETES Act as a model for other agencies.**

We see the America COMPETES Act, as it pertains to the National Science Foundation, as the most replicable and sustainable model for increasing public access to the results of federally funded research.

- It focuses on broadening access to government-funded unpublished research outputs (not to publisher-funded published research outputs) by making short summaries of research results and publication citations of federally funded research publicly accessible.
- This model appropriately recognizes and does not undermine the value-add that publishers bring to the formal scholarly communication system.
- Publishers would likely be willing to develop this basic model into a collaborative public-private partnership by providing journal article abstracts and developing links from publication citations in project reports to the peer reviewed published journal article hosted on the publisher’s website.

Other models to consider are the European PEER project, and initiatives by Wellcome Trust, HHMI and the British Heart Foundation. The European PEER project, funded by the European Commission, is a partnership between publishers and research institutions in the EU to investigate the effects of embargoed access to posted manuscripts on the viability and sustainability of journals. The study is expected to be completed in the next three years. Studies of this nature are necessary to fully understand what access problems exist and to test and learn possible solutions.

The Wellcome Trust, HHMI and British Heart Foundation policies are also other models to consider. In each of these models, the funding body provides compensation to publishers for the added value that they provide.

Publishers are deploying numerous mechanisms to achieve even broader public access, including extended licensing schemes, sponsored access, free on-site “walk-in” online access, and subsidized transactional access e.g. Elsevier’s Patient Research. Scholarly disciplines and journals are extremely diverse and complex, and different types of mechanisms will work for different disciplines and journals. The government should therefore not prescribe any one single mechanism to achieve public access, such as mandating researchers to publish in journals that make the published journal article freely available after embargo periods. Rather, it should explore and support the full range of mechanisms by which public access can be achieved sustainably.

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The commentary above covers Elsevier’s key perspectives on the overall topics of STM publishing, government-funded research and public access. In the following section we respond to the specific questions posed by OSTP as part of the RFI process. We have set out answers to each of those questions below, although it will become evident that these answers necessarily repeat some of the key points that were stated in the commentary above.

## C. RESPONSE TO QUESTIONS POSED BY OSTP

*Question 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?*

- The current system for the dissemination of scholarly information is an example of a well-functioning public-private collaboration: the government contributes funds for research; researchers and their institutions then provide the facilities and knowledge to support research and informal communications; publishers manage the value-added peer review publishing and distribution system of formal scholarly communication via STM journals which place such research into context, assist in its validation, and distribute and preserve the scientific record. Finally, libraries and universities subscribe to journals to provide access to their researchers and readers.
- The role of the publisher in this process is critical. Private sector publishers manage the peer review of manuscripts, apply quality standards, create new journals in developing fields of science, provide electronic platforms for efficient discovery and archive the version of record. Publishers also provide a number of other value added services such as high quality production, reference checking and reference linking. See page 3 for a more complete listing of the activities performed and funded by publishers.
- A government mandated public access policy such as that implemented by NIH undermines incentives for the peer review, publishing and dissemination of private-sector journal articles. However, there are other approaches that would provide meaningful access and not negatively impact the peer review publishing system. These include:
  - The America COMPETES Act that directs the National Science Foundation to provide access to government-funded research reports (not to publisher-funded published research outputs), short summaries of research results and citations to journal articles reporting on federally-funded research.
  - US government-funded national subscription licenses: a mechanism that would not impact the peer review publishing system itself, aside from the consolidation of buying power from several thousand individual institutions to one national subscriber, i.e. the US government.
  - US government sponsored unlimited access to individual articles by authors whose research it had funded, as done by HHMI or Wellcome Trust (see discussion above).

*Question 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?*

- Elsevier supports the notion that taxpayers should have access to the outputs of taxpayer-funded research, and that the government should therefore ensure access to such outputs. The government could require that research outputs such as experimental data, technical reports, grant reports, and conference papers are posted online. Such a policy would not infringe on or appropriate the value-adding activities of the publishing process.
- However, the government should not appropriate versions of scholarly material (accepted author manuscripts and published journal articles) in which publishers have invested and added value. Such policies would not be justifiable or warranted, and would result in government “taking” of private-sector products.
- If the government does implement a public access policy that pertains to published research outputs, it should do so according to clear principles, as discussed in part B6 of our main commentary above, i.e. the government should:
  - Work in full and open consultation with all vested stakeholders
  - Proceed with extreme caution
  - Fund the publishing activities of any publishing outputs that it seeks to make freely available
  - Be evidence-based taking account of key differences across subject disciplines
  - Not pursue “one-size-fits-all” policies across subject disciplines or journals
- There are numerous mechanisms that the US government could deploy to achieve even broader public access, including working with publishers on extended licensing schemes, sponsored access, free on-site “walk-in” online access, and subsidized transactional access, e.g. PatientINFORM and Elsevier’s Patient Research. Scholarly disciplines and journals are extremely diverse and complex,

and different types of mechanisms will work for different disciplines and journals. The government should therefore not prescribe any one single mechanism to achieve public access, such as mandating researchers to publish in journals that make the published journal article freely available after embargo periods. Rather, it should explore and support the full range of mechanisms by which public access can be achieved sustainably.

**Question 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?*

- Researchers and academics are the primary users of peer-reviewed publications. Over 95% of STM journals are online. 75% of researchers describe access to research as “good” or “very good.” One study showed that 94% of university and college based respondents found access to information “very easy” or “fairly easy”, and access to journals is 14th on their list of concerns (lack of funding is number one; too much paperwork is number five).<sup>11</sup>
- Public access users constitute a tiny fraction of the overall user base of STM journals, not least because STM journal articles are so highly specialized and technical.<sup>12</sup> However, access for the public is also extremely broad, having expanded dramatically due to initiatives that STM publishers have led in collaboration with others to broaden access for researchers in developing countries, patients, the public and disabled persons. For example:
  - Research4Life is a public-private United Nations initiative that makes thousands of STM journals available to over 5,000 institutions in over 100 developing countries at no or low cost. In 2009, Elsevier alone had more than 2.5 million articles downloaded as part of Research4Life initiatives.
  - Publishers, including Elsevier, have created PatientINFORM in partnership with key medical associations including the American Cancer Society, the American Heart Association, and the American Diabetes Association. PatientINFORM is a public health literacy project that provides patients and caregivers with a free online resource of interpreted, packaged, and up-to-date research about specific diseases that is based upon recently published journal articles.
  - Elsevier’s Patient Research gives patients and their family members desktop access to articles in 100 medical journals for a processing fee of less than \$5 per article.
  - Elsevier’s “walk-in” clause enables libraries licensing ScienceDirect to give any member of the public free electronic on-site access to any journal article licensed by a library. Other publishers have similar programs.
  - Access for visually impaired persons (VIP) has also been increased as publishers have voluntarily implemented “read aloud” software for online sites.
- There is no systematic quantitative evidence to show that access is an issue for researchers or the public. It is therefore unclear why the government would seek to implement any policy that pertains to the outputs of published research.

**Question 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?*

- Peer reviewed papers do not arise from federal agencies’ funds. Peer reviewed papers arise from the peer review publishing process that publishers fund.
- If federal agencies want to ensure public access to peer reviewed papers they should provide funds either to license access for specific public users in the US, or to sponsor access for all potential users globally (see response to question 3 for a fuller discussion of possible mechanisms).
- To gauge whether there is an increased return on federal investment gained by expanded access the US government would first need to quantify what existing levels of access are for researchers and the public, and what is spent to achieve those levels. It would then need to quantify what metrics would be used to define “return” on investment, e.g. articles published, patents applied for. Once baseline metrics have been established – and to our knowledge they do not exist today – only then could

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<sup>11</sup> Publishers Research Consortium (PRC) study, “Access by UK small and medium-sized enterprises to professional and academic information,” (2009).

<sup>12</sup> According to the PRC study (2009), 72% of respondents from universities reported reading journal articles several times a week, whereas only 43% of SMEs and 30% from large companies read journal articles several times a week.

impact be measured. We would recommend that impact on other areas that are also important to STM researchers and society are also quantified, e.g. quality control, researcher productivity and cost effectiveness.

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

- Evidence strongly indicates that compliance rates are much higher where publishers are voluntarily included as part of the process and where funds are appropriately made available to recognize and compensate publishers for their value-added contributions to the formal scholarly communications system. For example, Elsevier has established agreements with the Wellcome Trust and HHMI to help their authors meet their public access policies. The compliance rate for HHMI authors is 100%. As a result of working with Elsevier to improve systems and communication, the compliance rate for Wellcome Trust authors publishing in Elsevier titles has increased by 47% since October 2008.
- Mandating researchers is not an effective way to ensure compliance. While posting rates to PubMed Central have increased since the NIH policy was mandated, the increase is mostly due to publishers' voluntarily co-operation not to researchers' behavior. For example, Elsevier accounts for almost 40% of manuscripts posted to PubMed Central because it voluntarily deposits all manuscripts from NIH-funded researchers 12 months after publication on behalf of authors, not because authors have changed their behavior. This is significantly more manuscripts than would be expected given that Elsevier publishes only 25% of articles by NIH-funded researchers. This voluntary depositing predated the NIH mandate and was begun as a good faith effort to work in public-private partnership with NIH.
- By contrast, there are many examples of institutional mandates that have near-zero compliance because only around 5% of authors voluntarily post their manuscripts and because publishers have not agreed to the terms of such systematic posting policies.
- In summary, co-operation with publishers, not mandates of researchers, is the key to ensuring compliance.

**Question 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?*

- We find the options presented in this question to be limited and leading. We agree that the public should have access to the outputs of publicly funded research. Those outputs include conference papers, experimental data, and the author's preprint version submitted for consideration before it has benefited from peer review organized by the publisher and from technical processes like copy editing, typesetting, reference linking etc.; and, crucially, from the association with a journal's brand that helps guide users to trustworthy content and improves research efficiency.
- We do not agree that any versions of a paper that are the result of publishers' investments, (i.e. accepted author manuscripts and published journal articles) "should" be made public under a public access policy unless the government compensates the publishers for their private-sector investments.

**Question 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?*

- Elsevier does believe that the author's preprint (the manuscript submitted for consideration) may be made publicly available as soon as the authors or their funding bodies wish. In fact, most journals already allow authors to post their preprints online – to repositories or personal websites.
- However, for accepted author manuscripts and published journal articles, both of which publishers have invested in heavily, we believe that publishers should determine the business models on which their publications operate and this should include the time, if any, at which the final peer-reviewed manuscript or final published article are made publicly available.
- Publishers are best placed to determine the optimal embargo period which varies greatly by discipline and based on the characteristics of the journal including usage patterns, frequency of publication, etc.. Prescriptive, one-size-fits-all policies may have unintended consequences and cause undue harm to the scholarly communications system.

- Only around 6% of published journal articles are made openly available after an embargo period, and in the vast majority of cases that embargo is 12 months or longer. The percentage of articles made available in this way varies widely by discipline.
- Only around 8% of preprints and accepted author manuscripts are posted. The percentage of preprints and manuscripts posted also varies widely by discipline.

**Question 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?*

- We believe that the solutions to these issues will, and should, primarily emerge from the private sector including large and small commercial publishers, and not-for-profit university and society publishers. Digital standards for interoperability and preservation are still emerging. Successful industry-led initiatives like CrossRef (<http://www.crossref.org/>) which provides linking across 21,000 journals and Portico, an archiving solution, are examples of how publishers have worked in collaboration. A sustainable STM system ensures that publishers will have the resources to continue to innovate as the technology continues to evolve.

**Question 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?*

- Publishers invest time and money in making their content usable. We do not believe that metrics like the number of downloads or visitors will be enlightening measures of success. To properly assess the impact of a public access policy we believe that the federal government should assess who is accessing content, for what purpose, determine how useful the content was to the user and the impact that the content had on the user's aims.
- It should also be noted that many publishers who are within societies provide public engagement services, where information that has appeared in the scientific literature is digested and reproduced in a friendly format for the non-specialist public user. Access to primary articles for the general public is unlikely to be of benefit in most cases.



Youngsuk Chi  
Chief Executive Officer, Science & Technology  
Elsevier  
360 Park Avenue South  
New York, NY 10010



Michael Hansen  
Chief Executive Officer, Health Sciences  
Elsevier  
1600 John F. Kennedy Blvd  
Philadelphia, PA 19103