



**ACS Submission to the  
Office of Science and Technology Policy  
Request for Information on  
Public Access to Peer-Reviewed  
Scholarly Publications  
Resulting from Federally Funded Research**

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The American Chemical Society (ACS) is the world's largest scientific society with more than 164,000 members. ACS advances knowledge and research through scholarly publishing, scientific conferences, information resources for education and business, and professional development efforts. The ACS also plays a leadership role in educating and communicating with public audiences—citizens, students, public leaders, and others—about the important role that chemistry plays in identifying new solutions, improving public health, protecting the environment, and contributing to the economy.

ACS Publications is a division of the American Chemical Society. The Publications Division strives to provide its members and the worldwide scientific community with a comprehensive collection, in any medium, of high-quality information products and services that advance the practice of the chemical and related sciences. Currently, over 40 peer-reviewed journals and magazines are published or co-published by the Publications Division. Over 290,000 pages of research material are published annually, representing over 37,000 research papers. With the introduction of the ACS Journal Archives in 2002 and the C&EN Archives in 2011, we provide searchable access to over one million original chemistry articles dating back to 1879.

ACS Publications offers both sponsored and author-enabled open access to research articles through our ACS Author Choice and ACS Articles on Request programs. In addition, digital data that supports the findings of articles and bibliographic information, including abstracts of research articles, are freely available on our website. Since the beginning of the transition to electronic publishing in the mid- to late-1990s, we have developed, and are continuing to develop, innovative and accessible business models, policies, and practices to support the scholarly communication process and broaden information access.

As a socially responsible organization deeply rooted in the scholarly community, we share the interest of the Federal government in maximizing the dissemination and discoverability of knowledge. ACS believes that success in this area will hinge on these efforts being sustainable for publishers over the long-term. We welcome for the opportunity to respond to the invitation to contribute to the Request for Information (RFI) on Public Access to Peer-Reviewed Scholarly Publications Resulting from Federally Funded Scientific Research published by Office of Science and Technology Policy (OSTP) in the Federal Register on November 4, 2011.

Our response is in two parts: first a summary of our overall comments and recommendations, and second, answers to the specific questions posed in the RFI.

## **I. Summary**

The primary “markets” for peer-reviewed articles that analyze and interpret scientific research funded by Federal agencies are the academic, corporate, and governmental research and education communities. These communities are already well served by scholarly societies and scientific publishers like the ACS. In a study conducted by the Publishing Research Consortium and released in 2010, 97% of researchers in North America reported they had “very easy or fairly easy” access to research articles in journals. Over 96% of scientific, technical, medical (STM) journals are globally accessible in electronic form and that many publishers like ACS have retrospectively digitized early hard copy material back to the first volumes.

We believe that it is in the public interest to foster this economically beneficial publishing activity and invest heavily in staff and technology resources required to be successful. This investment contributes both directly and indirectly to U.S. job creation and economic growth. We invite the federal government to support our efforts and close whatever access gaps may exist by funding or licensing free-access to the version of record in collaboration with us, in a manner similar to the Howard Hughes Medical Institute and the Wellcome Trust which allow researchers they fund to use a portion of their grant funds to facilitate immediate open access to their published research. Both organizations recognize the value added to manuscripts by publishers and the peer-review process.

Similar federal arrangements with their researchers would respect our rights in these articles as well as allow us to recover the significant investments we have made in their development and dissemination. This promotes a sustainable scholarly communication enterprise and supports the creation of new jobs and industries that can arise from scientific advances. Such arrangements could consist of direct financial sponsorship to make articles arising from federally funded research immediately publicly available or a licensing agreement through which users of public federal websites could access the published article from its source at the ACS. We encourage the federal government to pursue this strategy on a voluntary basis with other responsible publisher partners taking into account the various models under which they provide access to different research communities.

Policies that require open access publication but that provide no specific funding for such publication are impractical and unsustainable. Green Open Access, or author self-archiving in institutional repositories, lacks a sustainable financial business model and has been found to have significant risks attached to it – see *Heading for the open road: costs and benefits of transitions in scholarly communications* from the Research Information Network available at <http://www.rin.ac.uk/transdynamics>. The assumption that costs for it are “paid through institutional journal subscription fees” is misleading since the presence of free copies of articles in repositories may jeopardize the continued subscription to journals containing those articles. Key stakeholders in scholarly communication are currently engaged in a large-scale project (PEER) to develop credible evidence on this important issue. Until this, or other credible evidence, is available, we believe that Federal agencies should be wary of broad mandates for “Green” open access with the potential for unknown and unintended harmful, long-term consequences.

Our analysis of web usage of ACS content deposited in NIH’s PubMed Central in accordance with the current Public Access mandate has revealed that at the time embargoed ACS copyrighted content becomes openly available on PubMed Central, a measurable and statistically significant diminution of web usage activity for the same content occurs on the ACS’s own web site. Further evaluation of these web usage trends is ongoing; however, ACS shares the concerns of other scientific publisher and societies that federal open access mandates, particularly if modeled on the NIH Public Access policy as currently implemented, would impact adversely our economic interests in copyright, and thus expropriate value in intellectual property investments we have made in undertaking the peer review and publications of scientific research articles.

## II Response to RFI Questions

**(1) Are there steps that agencies could take to grow existing and new markets related to the access and analysis of peer-reviewed publications that result from federally funded scientific research? How can policies for archiving publications and making them publically accessible be used to grow the economy and improve the productivity of the scientific enterprise? What are the relative costs and benefits of such policies? What type of access to these publications is required to maximize U.S. economic growth and improve the productivity of the American scientific enterprise?**

The primary markets for peer-reviewed articles that analyze and interpret research funded by Federal agencies are the academic, corporate, and governmental research and education communities. These markets are already well served by scholarly societies and scientific publishers like the ACS and peer-reviewed journals are the overwhelming vehicle of choice through which this material is disseminated, evaluated, and applied. In a global study conducted by the Publishing Research Consortium and released in 2010, 97% of researchers in North America reported they had “very easy or fairly easy” access to research articles in journals.

Currently, over 40 peer-reviewed journals and magazines are published or co-published by the ACS Publications Division. Over 290,000 pages of research material are published annually, representing over 37,000 research papers. In 2009, the Publications Division introduced the *ACS Symposium Series Online* and the *ACS Symposium Series Archives*. With the introduction of the ACS Journal Archives in 2002 and the C&EN Archives in 2011, we provide searchable access to over one million original chemistry articles dating back to 1879.

The journals that ACS publishes form a core part of the process of scholarly communication and are an integral part of scientific research and economic progress itself. ACS journals do not just disseminate information; they also provide a mechanism for the registration of the author’s precedence; maintain quality through peer review and provide a fixed archival version for future reference. They also provide an important way for scientists to navigate the ever-increasing volume of published material. Our journals showcase the world’s finest research in chemistry and related sciences, and the visibility that content in ACS journals receives not only helps scholars achieve new scientific breakthroughs but also leads to practical applications that directly benefit the U.S. economy and human health and welfare.

To enhance the access and use of our publications in primary markets and for the broader public, ACS offers both sponsored and author-enabled open access to research through our *ACS Author Choice* and *ACS Articles on Request* programs. In addition, data that supports the findings of articles, bibliographic information, including abstracts of research articles, are freely available on our website. Since the beginning of the transition to electronic publishing in the mid- to late-1990s, we have developed, and are continuing to develop, innovative and accessible business models, policies, and practices to support the scholarly communication process and broaden information access.

We believe that it is in the public interest to foster this economically beneficial publishing activity and toward that end we invest heavily in staff and technology resources required to be successful in this endeavor – further contributing to U.S. job creation and economic growth.

We invite the federal government to support our efforts by funding or licensing free-access to the version of record in collaboration with us, in a manner similar to the Howard Hughes Medical Institute and the Wellcome Trust which are allowing researchers they fund to use a portion of their grant funds to facilitate immediate open access to their published research through the ACS AuthorChoice program (see <http://pubs.acs.org/page/policy/authorchoice/index.html>). Both organizations recognize the value added to manuscripts by publishers and the peer-review process.

Similar federal arrangements with their researchers would respect our rights in these articles as well as allow us to recover the significant investments we have made in their development and dissemination – thereby promoting a sustainable scholarly communication enterprise and supporting the creation of new jobs and industries that can arise from scientific advances. Such arrangements could consist of direct financial sponsorship to make articles arising from federally funded research immediately publicly available or a licensing agreement through which users of public federal websites could access the published article from its source at the ACS. We encourage the federal government to pursue this strategy on a voluntary basis with other responsible publisher partners taking into account the various models under which they provide access to different research communities.

A recently released report by the Research Information Network, *Heading for the open road: costs and benefits of transitions in scholarly communications* (available at <http://www.rin.ac.uk/transdynamics>), supports this approach. Commissioned by the Research Information Network, the Publishing Research Consortium, the Wellcome Trust, Research Libraries UK and the UK Joint Information Systems Committee, the study by Cambridge Economic Policy Associates and Mark Ware Consulting is a substantial and very useful contribution to the debate around the future of scholarly communication. The study examines a number of scenarios surrounding the transition to greater access of the scholarly publishing system in the UK. The "Gold" (or author-pays) route to open access was the only access expansion model that the report considered to be fully sustainable. The "Green" (or repository self-archiving) route was found to have significant risks attached to it. This form of open access lacks a sustainable financial business model, and the assumption that costs for it are "paid through institutional journal subscription fees" is misleading since the presence of free copies of articles in repositories may jeopardize the continued subscription to journals containing those articles.

Our analysis of web usage of ACS content deposited in NIH's PubMed Central in accordance with the current Public Access mandate has revealed that at the time embargoed ACS copyrighted content becomes openly available on PubMed Central, a measurable and statistically significant diminution of web usage activity for the same content occurs on the ACS's own web site. Further evaluation of these web usage trends is ongoing; however, ACS shares the concerns of other scientific publisher and societies that federal open access mandates, particularly if modeled on the NIH Public Access policy as currently implemented, would impact adversely our economic interests in copyright, and thus expropriate value in intellectual property investments we have made in undertaking the peer review and publications of scientific research articles.

Finally, ACS notes that over 96% of scientific, technical, medical (STM) journals are globally accessible in electronic form and that many publishers like ACS have retrospectively digitized early hard copy material back to the first volumes. There is enormous variety and choice in

new and existing markets for peer-reviewed publications. It is estimated that there are about 25,400 active scholarly peer-reviewed journals globally, collectively publishing about 1.5 million articles a year. Some 50,000 U.S. workers are involved in private-sector scientific publishing and global annual revenues generated from English-language STM journal publishing revenues were recently estimated to be c. \$8 billion annually with 45% of this total (\$3.6 billion) coming from outside the U.S. In our case the percentage is even higher; approximately two-thirds of our peer-reviewed journal revenues originate from non-U.S. sources.

**(2) What specific steps can be taken to protect the intellectual property interests of publishers, scientists, Federal agencies, and other stakeholders involved with the publication and dissemination of peer-reviewed scholarly publications resulting from federally funded scientific research? Conversely, are there policies that should not be adopted with respect to public access to peer-reviewed scholarly publications so as not to undermine any intellectual property rights of publishers, scientists, Federal agencies, and other stakeholders?**

ACS believes that the best way for the federal government to protect the intellectual property interests of all stakeholders in the scholarly communication process is to fund or license free-access to the version of record in collaboration with us, in a manner similar to the Howard Hughes Medical Institute and the Wellcome Trust which are allowing researchers they fund to use a portion of their grant funds to facilitate immediate open access to their published research through the *ACS AuthorChoice* program (see <http://pubs.acs.org/page/policy/authorchoice/index.html>). Both organizations recognize the value added to manuscripts by publishers and the peer-review process.

Similar federal arrangements with their researchers would respect our rights in these articles as well as allow us to recover the significant investments we have made in their development and dissemination – thereby promoting a sustainable scholarly communication enterprise and supporting the creation of new jobs and industries that can arise from scientific advances. Such arrangements could consist of direct financial sponsorship to make articles arising from federally funded research immediately publicly available or a licensing agreement through which users of public federal websites could access the published article from its source at the ACS. We encourage the federal government to pursue this strategy on a voluntary basis with other responsible publisher partners taking into account the various models under which they provide access to different research communities.

Policies that require open access publication but that provide no specific funding for such publication are impractical and unsustainable. Green Open Access, or author self-archiving in institutional repositories, lacks a sustainable financial business model and has been found to have significant risks attached to it. The assumption that costs for it are “paid through institutional journal subscription fees” is misleading since the presence of free copies of articles in repositories may jeopardize the continued subscription to journals containing those articles. Key stakeholders in scholarly communication are currently engaged in a large-scale project (PEER) to develop credible evidence on this important issue. Until this, or other credible evidence, is available, we believe that Federal agencies should be wary of broad mandates for “Green” open access with the potential for unknown and unintended harmful, long-term consequences.

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**(3) What are the pros and cons of centralized and decentralized approaches to managing public access to peer-reviewed scholarly publications that result from federally funded research in terms of interoperability, search, development of analytic tools, and other scientific and commercial opportunities? Are there reasons why a Federal agency (or agencies) should maintain custody of all published content, and are there ways that the government can ensure long-term stewardship if content is distributed across multiple private sources?**

There are many who would view with concern the prospect of government control of scientific publications and the tools by which it can be searched and analyzed. An approach that would be more consistent with democratic and free market principles would be to foster the development and growth of interoperable repositories such as those hosted on publisher sites like the ACS. Publishers have already developed and are working on collaborative projects to foster interoperability between different public access systems. Such projects include:

- The Digital Object Identifier (DOI, <http://www.doi.org/>) for persistent identification, managing intellectual content, managing metadata, linking customers with content suppliers, facilitating electronic commerce, and enabling automated management of media. DOI names can be used for any form of management of any data, whether commercial or non-commercial. The DOI System is an ISO International Standard.
- CrossRef (<http://www.crossref.org/>) a non-profit organization whose mission is to be a trusted collaborative organization with broad community connections; authoritative and innovative in support of a persistent, sustainable infrastructure for scholarly communication. CrossRef's general purpose is to promote the development and cooperative use of new and innovative technologies to speed and facilitate scholarly research. Its specific mandate is to be the citation linking backbone for all scholarly information in electronic form and function as a sort of digital switchboard. It holds no full text content, but rather effects linkages through CrossRef Digital Object Identifiers (CrossRef DOI), which are tagged to article metadata supplied by the participating publishers. The end result is an efficient, scalable linking system through which a researcher can click on a reference citation in a journal and access the cited article.
- Open Research and Contributor ID (ORCID, <http://orcid.org/>) a non-profit organization dedicated to solving the author/contributor name ambiguity problem in scholarly communications by creating a central registry of unique identifiers for individual researchers and an open and transparent linking mechanism between ORCID and other current author ID schemes. These identifiers, and the relationships among them, can be linked to the researcher's output to enhance the scientific discovery process and to improve the efficiency of research funding and collaboration within the research

community. A resolution to the systemic name ambiguity problem, by means of assigning unique identifiers linkable to an individual's research output, will enhance the scientific discovery process and improve the efficiency of funding and collaboration.

In its review of the relative merits of centralized and decentralized approaches to achieving interoperability, the 2009 *Report and Recommendation from the Scholarly Publishing Roundtable* noted “Decentralization is critical to achieving this goal, especially with respect to interdisciplinary research...the standards and tools adopted by NIH, which effectively support interoperability within PubMed Central, do not provide broad interoperability with external databases, which are growing in number and size.”

ACS, like other publishers, has made arrangements with a trusted third party vendor to ensure the long-term availability of our content in the unlikely event of a lengthy service interruption or cessation of publishing activity. Our arrangements are with Portico (<http://www.portico.org/digital-preservation/>), a non-profit service of ITHAKA overseen by its Board of Trustees which represents all members of the academic community with an interest in the long-term preservation of scholarly content, including university presidents, librarians, publishers, and faculty members. In addition to Portico there are a wealth of other options for the long-term preservation of publications – CLOCKSS, LOCKSS, etc.

**(4) Are there models or new ideas for public-private partnerships that take advantage of existing publisher archives and encourage innovation in accessibility and interoperability, while ensuring long-term stewardship of the results of federally funded research?**

Yes. In May 2011 a group of scientific publishers met with NSF officials to explore ideas about collaborative projects that would enhance the public access, utility, and preservation of the results from NSF-funded research including reports, scholarly publications and data for use by both the research community and the general public. Publishers then followed up with a briefing paper where potential collaborations and partnerships with NSF that scientific publishers can provide to develop and implement were outlined. These projects/pilots included the development of standards and persistent identifiers to enhance the discoverability of NSF-funded research results and to promote interoperability among the NSF, publisher and any third party databases and platforms and possible pilot projects that would drive access, use and innovation from NSF-funded research results. These pilot project examples were offered to NSF as a basis for continuing discussions on collaborative efforts between NSF and the scientific publishing community. Such collaboration has the potential to significantly advance the achievement of joint objectives related to the dissemination and long-term stewardship of research results.

**(5) What steps can be taken by Federal agencies, publishers, and/or scholarly and professional societies to encourage interoperable search, discovery, and analysis capacity across disciplines and archives? What are the minimum core metadata for scholarly publications that must be made available to the public to allow such capabilities? How should Federal agencies make certain that such minimum core metadata associated with peer-reviewed publications resulting from federally funded scientific research are publicly available to ensure that these publications can be easily found and linked to Federal science funding?**



Steps are already being taken. Some funding agencies (e.g. NSF) currently require researchers to acknowledge in publications the support they have received. However, there are no standards on how this should be done. Consequently, federal agencies find it difficult to know and track what publications have arisen from the research they funded. Publishers have proposed to collaboratively develop a means of standardizing funder information and making that information available to the funding agencies in a public-private partnership, titled CrossGrant. CrossGrant was officially launched in fall 2011 by the non-profit publisher-led organization CrossRef and involves a collaboration with DOE-OSTI, which has offered to take responsibility for producing and maintaining a dictionary of funding agency names and associated nomenclature. A working group has been formed to plan and implement the CrossGrant project. It includes the Executive Directors of the CrossRef and NISO, as well as data experts from several publishers and funding agencies (e.g. DOE-OSTI and Wellcome Trust).

We believe that a community-wide solution of this type is easier and far less expensive to construct than each agency developing its own response to the problem. This is because publishers are in the best position to provide a simple way of ensuring that journal articles are accompanied by standardized, high-quality metadata providing information about the agency, program, and even specific grant that funded the research. Agencies lack a full accounting of this information.

**(6) How can Federal agencies that fund science maximize the benefit of public access policies to U.S. taxpayers, and their investment in the peer-reviewed literature, while minimizing burden and costs for stakeholders, including awardee institutions, scientists, publishers, Federal agencies, and libraries?**

ACS believes that the federal government can best maximize the benefit of public access to articles that analyze and interpret research funded by taxpayers and minimizing the burden and true costs for all stakeholders by funding or licensing free-access to the version of record in collaboration with us, in a manner similar to the Howard Hughes Medical Institute and the Wellcome Trust which are allowing researchers they fund to use a portion of their grant funds to facilitate immediate open access to their published research through the ACS *AuthorChoice* program (see <http://pubs.acs.org/page/policy/authorchoice/index.html>). Both organizations recognize the value added to manuscripts by publishers and the peer-review process.

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A recently released report by the Research Information Network, *Heading for the open road: costs and benefits of transitions in scholarly communications* (available at

<http://www.rin.ac.uk/transdynamics>), supports this approach. Commissioned by the Research Information Network, the Publishing Research Consortium, the Wellcome Trust, Research Libraries UK and the UK Joint Information Systems Committee, the study by Cambridge Economic Policy Associates and Mark Ware Consulting is a substantial and very useful contribution to the debate around the future of scholarly communication. The study examines a number of scenarios surrounding the transition to greater access of the scholarly publishing system in the UK. The "Gold" (or author-pays) route to open access was the only access expansion model that the report considered to be fully sustainable. The "Green" (or repository self-archiving) route was found to have significant risks attached to it. This form of open access lacks a sustainable financial business model, and the assumption that costs for it are "paid through institutional journal subscription fees" is misleading since the presence of free copies of articles in repositories may jeopardize the continued subscription to journals containing those articles.

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**(7) Besides scholarly journal articles, should other types of peer-reviewed publications resulting from federally funded research, such as book chapters and conference proceedings, be covered by these public access policies?**

As a socially responsible member of the scholarly publishing community, ACS recommends that the federal government should first ensure that it can fiscally support funding or licensing free-access from affected publishers to other types of peer-reviewed publications before enacting further public access policies. As noted elsewhere in our response to this RFI, funders like the Howard Hughes Medical Institute and the Wellcome Trust allow researchers to use a portion of their grant funds to comply with their public access policies and to facilitate immediate open access to their published research.

**(8) What is the appropriate embargo period after publication before the public is granted free access to the full content of peer-reviewed scholarly publications resulting from federally funded research? Please describe the empirical basis for the recommended embargo period. Analyses that weigh public and private benefits and account for external market factors, such as competition, price changes, library budgets, and other factors, will be particularly useful. Are there evidence-based arguments that can be made that the delay period should be different for specific disciplines or types of publications? Please identify any other items the Task Force might consider for Federal policies related to public access to peer-reviewed scholarly publications resulting from federally supported research.**

We caution the federal government against the use of overbroad and simplistic embargo periods. If embargo periods are to be used, they must take into account both the practices of the discipline and the frequency of the relevant journal publications – one-size will not fit all. To date there is no data on the mid or long-term effects of large-scale archiving of peer-reviewed manuscripts, under differing embargo periods, on the health, viability and sustainability of the scholarly communication system. Different disciplines use information at different rates and one-size-fits-all policies (i.e. a single uniform embargo period) will not work. In order to learn what the effect of such policies might be *before* they are implemented, the European Union is currently funding a collaborative study (PEER) involving publishers, repositories, and researchers on the effects of the large-scale, systematic depositing of final peer reviewed manuscripts on reader access, author visibility, and journal viability, as well as on the broader research environment (see <http://www.peerproject.eu/reports> for more information). ACS supports this evidence-based approach to policy-making and recommends a similar approach for the federal government.

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