Scholarly Publishing & Academic Resources Coalition

Support for National Institutes of Health (NIH)
Implementation of the Revised Public Access Policy

May 30, 2008

The following comments are submitted by SPARC (Scholarly Publishing and Academic Resources Coalition) in response to the National Institutes of Health (NIH) "Request for Information: NIH Public Access Policy" issued on March 31, 2008 (73 *Federal Register* 16881).

SPARC, established in 1997, is an alliance of hundreds of academic libraries and research institutions that advocate expanded availability and use of scientific and scholarly research findings via adoption of new scholarly communication practices that effectively utilize the capabilities of the Internet.

We commend NIH's extensive efforts to seek input from the full range of stakeholders throughout the public access policy development process. We believe the agency's overall response to constructive input has been commendable and that a fundamentally workable policy has resulted from the consultative process. We offer these further comments in order to demonstrate the strategic soundness and overall balance of the policy, and to underscore our community's continued willingness to work with NIH to ensure that the benefits of this policy may be fully realized by all stakeholders.

Need for a Public Access Policy
SPARC believes widespread dissemination of research results is an essential, inseparable component of the U.S. Government's investment in science. It is only through application of findings that funders—and, by extension, taxpayers—obtain adequate value from their investment. Faster and wider sharing of knowledge fuels the advance of science and thus the return of health, economic, and social benefits to the public.

Until relatively recently, funding agencies could rightly feel satisfied that their investment in research was being adequately leveraged via dissemination of findings exclusively in toll-access journals. It would have been inefficient and cost-prohibitive for them to take on or supplement publishers' dissemination of the results in a paper-based environment. However, the Internet can now bring timely and universal access to the ~80,000 articles that arise each year from NIH funding. The marginal cost of doing so, which is less than 0.02% of NIH's annual budget, is trivial relative to the tremendous leverage it offers.

A growing number of studies document that when scientific research is accessed more freely on the Internet it is cited sooner and more often in subsequent research.[1] According to economists Houghton

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[1] See "The effect of open access and downloads ('hits') on citation impact: a bibliography of studies," available at http://opcit.eprints.org/oacitation-biblio.html.

and Sheehan, the most immediate impacts of enhanced access would be likely to be felt within research, and include:

- Speeding up the research and discovery process, increasing returns to investment in R&D, and potentially reducing the time/cost involved for given outcomes;
- Enabling better-informed research, reducing the pursuit of blind alleys and reducing duplicative research, saving duplicative R&D expenditures, and improving their efficiency;
- Enhancing opportunities for multi-disciplinary research, inter-institutional and -sectoral collaborations, and enabling researchers to study their context more broadly, potentially leading to increased opportunities for and rates of commercialization; and
- Improving education outcomes, enabling a given education spend to produce a higher level of educational attainment, leading to an improvement in the capabilities of future researchers.

Enhanced access, such as the kind provided by the NIH Public Access Policy, also presents important new opportunities for private industry, including the potential to:

- Accelerate and widen opportunities for adoption and commercialization of research findings, increasing returns on public investment in R&D and on private investment in discovery and commercialization-related activities;
- Enable much wider access for doctors/nurses, teachers/students, small firms in consulting, biotechnology, nanotechnology, etc., with a positive impact on quality of services and, possibly, productivity of entities/sectors and their customers and clients;
- Encourage the emergence of new industries based upon open access content—similar to the weather derivatives industry based on public meteorological data;
- Open new opportunities for publishers to add value-added services overlaying open access content (*e.g.,* peer review, bibliometrics and webometrics for research evaluation, etc.), which might, in turn, enhance research evaluation and lead to better focused R&D expenditures.[2]

In addition to these benefits, public access to NIH-funded research will enable new computational research techniques and pathways such as text mining, creation of text-data linkages, and identifying and visualizing of relationships that could not otherwise be observed. The texts of journal articles in PubMed Central are linked to other public databases such as GenBank and PubChem, enabling researchers to explore relationships in powerful new ways. New kinds of interactivity between users and content and collaboration among geographically diverse researchers are also facilitated when all parties have access to a shared knowledge base. Such innovation is only feasible in the open environment and is precluded when research articles are locked up on proprietary websites.

The desirability of such an environment has been spotlighted by more than two-dozen Nobel Laureates who in 2007 pointed to its vital importance and emphasized the necessity of an investigator deposit mandate to enable public access:

> As we noted in a letter to Congress urging action on this policy nearly three years ago, we object to barriers that hinder, delay or block the spread of scientific knowledge supported by

[2] John Houghton and Peter Sheehan, "The Economic Impact of Enhanced Access to Research Findings," CSES Working Paper No. 23, July 2006, pp. 7-8. Available at http://www.cfses.com/documents/wp23.pdf.

> federal tax dollars—including our own works. Thanks to the internet, we can transform the speed and ease with which the results of research can be shared and built upon.
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> Despite best intentions, the voluntary policy enacted by NIH over two years ago has simply not improved public access significantly. As active scientists, it does not surprise us that a request—with neither incentives nor consequences attached—to submit our articles so that they are freely available simply does not make the lengthy "to-do" lists of our colleagues. We firmly agree with NIH Director Elias Zerhouni, who indicated in his testimony to the Senate LHHS Appropriations Subcommittee that only a mandatory policy will be an effective policy. Requiring compliance is not a punitive measure, but rather a simple step to ensure that everyone, including scientists themselves, will reap the benefits that public access can provide. We have seen this amply demonstrated in other innovative efforts within the NIH—most notably with the database that contains the outcome of the Human Genome Project.[3]

The higher education and research institute communities—recognizing that the broad dissemination of research is central to their core mission—have been vocal in support of NIH public access, as evidenced in public statements of the Association of American Universities (AAU)[4], the National Association of State Universities and Land-Grant Colleges (NASULGC)[5], and the Association of Independent Research Institutes (AIRI).[6]

Public access accommodates not just researchers' increasing needs to communicate rapidly, collaborate widely, and utilize emerging computational research methods, it also addresses the public's rising interest in self-education on health matters and need to see the results of their investment. Unfortunately, the access barriers faced by non-scientists such as teachers, patients, health practitioners, or small businesses are far greater than those encountered by scientists. Sharon Terry, President of the Genetic Alliance and mother of two children with a rare genetic disease called PXE, has described the problem in personal terms:

> My children have a genetic disease. It is rare, not well understood, and there is no treatment or cure. However, the most disturbing obstacle we face is the wall around published scientific research. Information critical to health and biomedical research is held hostage by questionable and arcane publishing practices. It is time for publishers, both private and academic, to respond to a new age of information sharing and a stronger sense of the scientific commons….[7]

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[3] Open letter to the U.S. Congress, July 8, 2007. Available at https://mx2.arl.org/Lists/SPARC-OAForum/Message/3858.html.

[4] Statement of Patrick White, Association of American Universities, at NIH Public Meeting, March 20, 2008, available at http://www.aau.edu/intellect/Comments_White_NIH_PAP_32008.pdf.

[5] "NASULGC Offers Support for NIH Public Access Policy" available at http://nasulgc.org/NetCommunity/Page.aspx?pid=896&srcid=836 .

[6] "AIRI Statement on Open Access, Released October 28, 2004." Available at http://www.airi.org/washington/statement_access.aspx. AIRI statements in support of the current mandatory NIH Public Access Policy implementation were presented at the March 20, 2008 NIH Public Meeting (http://videocast.nih.gov/ram/grants032008.ram) and posted on NIH's Comment Results web page (http://publicaccess.nih.gov/comments/comments_web_listing.htm).

[7] Sharon Terry, "In the Public Interest: Open Access," *C&RL News*, July/August 2005, Vol. 66, No. 7. Available at http://www.ala.org/ala/acrl/acrlpubs/crlnews/backissues2005/julyaugust05/publicinterest.cfm.

The extent of public support is illustrated by Harris Poll findings released May 31, 2006, showing eight out of ten (82%) adults surveyed believe that "if tax dollars pay for scientific research, people should have free access to the results of the research on the Internet." Six out of ten (62%) adults believe that if these research results are easily available (for free and online), it will help speed up finding potential cures for diseases.[8]

The US Chamber of Commerce, the world's largest business federation, also recognizes the benefits of NIH public access to America's business sector. "American businesses will benefit tremendously from improved access to NIH research," according to William Kovacs, the organization's vice president for environment, technology and regulatory affairs. "The Chamber encourages the free and timely dissemination of scientific knowledge produced by the NIH as it will improve both the public and industry's ability to become better informed on developments that impact them—and on opportunities for innovation."[9]

The publishing industry analysts at Credit Suisse First Boston have described the imperative for public access from another pertinent public-accountability perspective:

> [W]e would expect governments (and taxpayers) to examine the fact that they are essentially funding the same purchase three times: governments and taxpayers fund most academic research, pay the salaries of the academics who undertake the peer review process and fund the libraries that buy the output, without receiving a penny in exchange from the publishers for producing and reviewing the content....We do not see this as sustainable in the long term, given pressure on university and government budgets.[10]

NIH is hardly alone among research funders in recognizing the importance of public access. It is part of a broad worldwide movement to leverage the benefits of sharing research findings.[11] For example, the UK's publicly funded Medical Research Council (MRC) "requires electronic copies of any research papers that have been accepted for publication in a peer-reviewed journal, and are supported in whole or in part by MRC funding, to be deposited into PubMed Central (PMC) or UK PMC, to be made freely available as soon as possible and in any event within six months of the journal publisher's official date of final publication."[12] Major private biomedical funders Howard Hughes Medical

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[8] Harris Interactive, "Large Majorities of U.S. Adults Support Easy – and Free – Online Access to Federally-Funded Research Findings on Health Issues and Other Topics," The Harris Poll #44, May 31, 2006, http://www.harrisinteractive.com/harris_poll/index.asp?PID=671.

[9] Quoted in Alliance for Taxpayer Access, "Mandate for Public Access to NIH-Funded Research Poised to Become Law," October 24, 2007, available at http://www.taxpayeraccess.org/media/release07-1024.html. The Chamber of Commerce's support is also conveyed in "U.S. Chamber Applauds NIH Open Access Proposal; Action Will Make Taxpayer-Funded Research Freely Available to Public," a September 9, 2004 press release from the Chamber available at http://www.uschamber.com/press/releases/2004/september/04-121.htm.

[10] Credit Suisse First Boston, *Sector Review: Scientific, Technical and Medical Publishing*. April 6, 2004.

[11] Research funders' open access policies are compiled by SHERPA and available at http://www.sherpa.ac.uk/juliet/.

[12] Medical Research Council (UK), "MRC position statement in support of open and unrestricted access to published research." April 2008, available at http://www.mrc.ac.uk/PolicyGuidance/EthicsAndGovernance/OpenAccessPublishingandArchiving/PositionStatement/index.htm.

Institute[13] and Wellcome Trust[14] also both require availability of their funded research in PubMed Central or UK PubMed Central within six months of journal publication.

Even without the growing international take-up of public access, it would be in the U.S. taxpayer's interest to make it easier for the rest of the world to access the results of U.S.-funded research. We collectively benefit from medical advances by scientists who often work collaboratively across national boundaries. Substantial leverage on the U.S. research investment is obtained when a discovery reported by an US-based NIH investigator leads to a further advance by a researcher elsewhere. This leverage needs to be encouraged and expanded if we are to effectively meet such complex global challenges as avian influenza and HIV/AIDS.

Enhancement of NIH management capabilities is yet another rationale for investigator deposit of their funded research findings in PubMed Central. As Director Zerhouni has pointed out, this will permit NIH to monitor, mine, and develop its portfolio of funded research more effectively and will make it easier for all scientists to pursue NIH's research priorities effectively.[15] The NIH Public Access Policy is a critical element of the larger adaptation to opportunities for innovation brought about by the Internet and networked technology. It will result in a more dynamic and faster-moving scientific process, better suited to address increasingly complex health challenges.

Sufficiency of the NIH Policy Development Process

The protracted and deliberative process leading to the NIH Public Access Policy that took effect on April 7, 2008 has resulted in an implementation approach that effectively balances the reasonable interests of all stakeholders. In the months since its announcement on January 11, 2008, NIH and its grantee institutions have made substantial headway in introducing the new policy to investigators. As a result, investigator deposits in PubMed Central have surged in 2008—nearly doubling in the short time the policy has been mandatory.[16]

This welcome and anticipated upturn in compliance comes after a long consultative process that began in 1999, when then-NIH Director Harold Varmus articulated a proposal that ultimately led to establishment of NIH's PubMed Central online digital archive.[17] PubMed Central, as originally deployed in February 2000 and expanded in the following several years, succeeded in securing voluntary deposit of research articles by a number of publishers and clearly demonstrated the benefits and scalability of an open online biomedical research resource and the absence of material risk to participating publishers. But, being voluntary, it failed to capture more than a tiny fraction of NIH-funded research.

At the same time, the U.S. Congress took a growing bipartisan interest. In 2004, the House Appropriations Committee expressed concern about the lack of public access to NIH research and put

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[13] Howard Hughes Medical Institute, "Research Policies: Public Access to Publications (SC-320)," June 11, 2007, available at http://www.hhmi.org/about/research/sc320.pdf.

[14] Wellcome Trust, "Position statement in support of open and unrestricted access to published research," February 2008, http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Open-access/Policy/index.htm.

[15] Elias A. Zerhouni, "The NIH Public Access Policy: Overview and Context," presentation at the NIH Open Meeting on Public Access, Mar. 20, 2008. http://publicaccess.nih.gov/comments/Overview_Context.pdf.

[16] Statistics available at: http://www.nihms.nih.gov/stats/index.html

[17] Dr. Varmus's proposal and selected comments are available at http://www.nih.gov/about/director/pubmedcentral/ebiomedarch.htm.

forward a solution recognizing the role of the Internet in advancing NIH's mission:

> The Committee is very concerned that there is insufficient public access to reports and data resulting from NIH-funded research. This situation, which has been exacerbated by the dramatic rise in scientific journal subscription prices, is contrary to the best interests of the U.S. taxpayers who paid for this research. The Committee recommends that NIH develop a policy, to apply from FY 2005 forward, requiring that a complete electronic copy of any manuscript reporting work supported by NIH grants or contracts be provided to PMC upon acceptance of the manuscript for publication in any scientific journal listed in the NLM's PubMed directory. Under this proposal, NLM would commence making these reports, together with supplemental materials, freely and continuously available six months after publication….[18]

Signaling the issue's importance to the agency, NIH Director Elias Zerhouni personally engaged the discussion by conducting multiple public meetings with publishers, scientists, and patient groups in 2004. Based on these meetings, NIH published a proposal for public access to NIH-funded research in the *NIH Guide* on September 3, 2004. It called on all NIH-funded investigators to "provide the NIH with electronic copies of all final version manuscripts upon acceptance for publication" for free public availability through PubMed Central "six months after an NIH supported research study's publication—or sooner if the publisher agrees." The proposal explicitly highlighted NIH's desire for stakeholder input:

> The economic and business implications of any changes to the current paradigm must be considered as the NIH weighs options to ensure public access to the results of studies funded with public support without compromising the quality of the information being provided. The NIH has established and intends to maintain a dialogue with publishers, investigators, and representatives from scientific associations and the public to ensure the success of this initiative.[19]

Between September 3 and November 16, 2004, NIH received 6,249 comments on the proposal, the overwhelming majority of which were supportive.[20]

Nevertheless, moving conservatively in the face of narrowly focused journal publisher concern, NIH implemented on May 2, 2005 an initial Public Access Policy that *requested* (rather than *mandated*) deposit of articles stemming from NIH-funded research and pushed the embargo on public access to as much as 12 months after publication. As part of its policy document, NIH presented an inventory of key issues raised in public comments and a detailed explanation of how the policy implementation takes account of these. They also articulated the agency's three sound strategic objectives:

1) Create a stable archive of peer-reviewed research publications resulting from NIH-funded research to ensure the permanent preservation of these findings;
2) Secure a searchable compendium of these peer-reviewed research publications that NIH and its awardees can use to manage more efficiently and to understand better their research

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[18] House Report 108-636, Departments of Labor, Health And Human Services, And Education, And Related Agencies Appropriation Bill, 2005. http://thomas.loc.gov/cgi-bin/cpquery/?&db_id=cp108&r_n=hr636.108&sel=TOC_338641&.
[19] Available at http://grants.nih.gov/grants/guide/notice-files/NOT-OD-04-064.html. Also published in the *Federal Register* on September 17, 2004 (http://edocket.access.gpo.gov/2004/pdf/04-21097.pdf).
[20] Presentation by Director Zerhouni at March 20, 2008 Open Meeting on Public Access, slide 12. Available at http://publicaccess.nih.gov/comments/Overview_Context.pdf.

portfolios, monitor scientific productivity, and ultimately, help set research priorities; and

3) Make published results of NIH-funded research more readily accessible to the public, health care providers, educators, and scientists.[21]

Within a year of the voluntary policy's implementation, it was clear that this approach—which resulted in deposit of fewer than five percent of eligible articles—failed to address the agency's stated objectives. Responding to the striking shortfall, the NIH Public Access Working Group—established by the NIH and composed of publishers, societies, researchers, patient groups, and libraries—recommended on November 15, 2005, that researchers be *required* to deposit articles in PubMed Central and that public access be provided within six months of journal publication. On February 8, 2006 the National Library of Medicine's Board of Regents endorsed this recommendation.[22]

The U.S. Congress agreed, inserting language into the LHHS Appropriations bill in 2006 and again in 2007, calling for deposit to become mandatory. This change, endorsed by both the House and the Senate, was signed into law in December 2007.

The current policy implementation is the outcome of nearly a decade of information gathering, broad and probing community discussion, and continuing bipartisan encouragement and direction from Congress. The issues have been extensively covered in the scientific press (e.g., *Science, Nature, New England Journal of Medicine, The Lancet*) and mainstream media (e.g., *NBC Nightly News*[23], National Public Radio*, USA Today, Wall Street Journal, Washington Post*). Scientists and the public support it, as do the current NIH director and his predecessor.

Despite this long history, a handful of publisher organizations, which do not speak for all journal publishers, continue to charge that the policy has been framed without adequate publisher consultation. This claim is absurd and groundless.

NIH has gone to great lengths to understand and, within reason, accommodate the needs of publishers. Indeed, *the Office of the NIH Director has met with publishers to discuss the policy 29 times* between 2003 and March 2008, *versus 20 meetings with all other stakeholders*.[24] In addition, publishers have had numerous meetings with the staff of the National Center for Biotechnology Information in the National Library of Medicine, where PubMed Central is maintained, to work out procedural matters associated with the policy implementation.

The policy has undergone a lengthy, thorough and extremely public vetting process, which has amply demonstrated that:

- NIH's objectives are important and well focused;
- Agency consultation with stakeholders (including journal publishers) on how best to implement the NIH Public Access Policy has been extensive;

[21] "Policy on Enhancing Public Access to Archived Publications Resulting from NIH-Funded Research," *NIH Guide for Grants and Contracts*, NOT-OD-05-022, February 3, 2005. http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-022.html.
[22] National Library of Medicine, Minutes of the Board of Regents, February 7-8, 2006. Available at http://www.nlm.nih.gov/od/bor/2-06bor.pdf.
[23] In December 2004, *NBC Nightly News* called the lack of public access to NIH-funded research a "Fleecing of America." See http://www.msnbc.msn.com/id/6660340.
[24] Presentation by Director Zerhouni at March 20, 2008 Open Meeting on Public Access, slide 12. Available at http://publicaccess.nih.gov/comments/Overview_Context.pdf.

- The various interests at issue and potential impacts are well understood by NIH;
- NIH has gone to great lengths to accommodate publisher demands, in particular by incorporating a lengthy access embargo provision in its policy;
- The peer review process will not be harmed by NIH's announced policy implementation; and
- Further delay or dilution of the policy is damaging to the public interest.

Strengths of the Current Policy Implementation
SPARC believes the policy now in force is a smart, well-considered, and effectively balanced means of accomplishing the agency's important objectives. Several features are the foundation of its strength:

PubMed Central Ensures Archiving and Access
Only by requiring deposit of articles in NIH's PubMed Central online archive can NIH ensure that:

- Articles will be systematically preserved over time in digital form;
- Persistent access will be assured to all potential users; and
- The potential of new computational research techniques will be unlocked.

No other solution put forward over the years meets these objectives or NIH and Congressional aims.

Providing a digital archive of NIH-funded research is entirely consistent with the mission of the National Library of Medicine, which for over 150 years has provided the public with access to and preservation of the biomedical literature. In the digital arena, its National Center for Biotechnology Information, home of PubMed Central and other online resources, already serves millions of users. It has been efficiently, effectively preserving and delivering full-text journal articles through PubMed Central for the past eight years, and has the proven infrastructure and expertise to handle the estimated 80,000 articles that will be deposited annually as a result of the policy. Publishers, on the other hand, have never had archiving in their business plans, a responsibility that has fallen squarely on the shoulders of libraries.

Archival stability could be further enhanced if the NLM archive contents were replicated at multiple sites, such as institutional digital repositories at the universities of NIH investigators and digital archives maintained by other nations' national libraries or research funders.

Inadequate Alternative Proposals
Several times over the years, opponents of the NIH proposal have called for publishers' web servers to substitute for PubMed Central. While we enthusiastically support the continuing role of journals and publishers' online journal aggregations, we reject in the strongest possible terms the notion that they can substitute for PubMed Central. NIH thoroughly studied a publisher-developed linking proposal, conducted discussions of this with the publishers, and ultimately, dismissed it as failing to address adequately the needs of either taxpayers or the government.

As an alternative to PubMed Central, linking would fail to address the need for stable, long-term digital preservation of and access to the public resource represented by articles resulting from NIH funding. Publishers cannot guarantee that they will continue to provide open access to the linked articles over the long term since they may someday change their business models, go out of business, or sell their journals. Perhaps most crucially, under this proposal, NIH and the public would be left with a "dark" archive—one that can only be accessed by a handful of individuals with proper permissions—and thus would be extremely vulnerable to erosion in the quality of its contents. It is

widely accepted that, for a large database to be properly curated, as many people as possible should access it and use the content on a regular basis, thus ensuring its continuing integrity.

Given the compelling and widely acknowledged need for digital preservation, linking will not save the government money since it does not obviate the relatively modest cost of transforming manuscripts into appropriate, standardized digital archiving formats and maintaining web access to these. Furthermore, the linking alternative would fail to address the computational research opportunities offered by a homogeneous database. Maintaining the federally underwritten scientific record on PubMed Central is a uniquely effective, scalable, economical, and practical solution to a pressing need and opportunity.

Suitability of Final Peer-reviewed Manuscripts
We are aware that questions have been raised about the impact of PubMed Central capturing "final peer reviewed manuscripts" rather than published articles (except when instigated by the publisher). We are convinced the strategy of capturing final peer-reviewed manuscripts in PubMed Central is a perfectly suitable approach. It well serves scientists and the public while reinforcing the differentiation between journals and PubMed Central. It is no different than the long tradition of releasing scientific findings in conference proceedings that precede peer-reviewed publication or the well-established practice of posting pre-prints by many journals (including many biomedical journals). It is similar to the experience in physics, where the arXiv.org pre-print server has co-existed with journals for a more than a decade. To our knowledge, none of these longstanding practices has resulted in damage to the scientific record or its users.

There are practical ways to mitigate any potential ambiguity of having pre- and post-print versions, such as by including links between article versions or embedding metadata to indicate the version.[25] There is no valid reason for such concerns to alter the NIH plan.

A Fair Balance of Interests in an Environment of Change
Before the Internet, the best available means of fulfilling the government's obligation to maximize sharing and application of its funded research findings was through the exclusive use of toll-gated channels offered by journal publishers. But in the digital networked environment, it is possible to do far better. It is thus fair, reasonable, and responsible for the government to attach requirements pertaining to dissemination of the article as a condition of the grantee acceptance of funds. And it is no less reasonable for the grantee to make those conditions a part of the author's transfer of rights to a publisher.

The publisher pays nothing to obtain the rights granted by the author. The quid pro quo is that the publisher will maximize availability of the article so that its findings are used and applied as widely as feasible. The expense of any value addition by the publisher is undertaken with full awareness of the author's obligation to the research funder. Given the unprecedented publicity surrounding the NIH Public Access Policy, it is unimaginable that the NIH requirement is unknown to any publisher of biomedical journals.

In a letter supporting the current NIH policy, Michael Rossner, Executive Director of the Rockefeller University Press, publisher of two high-impact biological science journals, frames the motives of policy opponents:

[25] Protocols for addressing this are under development by the National Information Standards Organization and the Version Identification Framework project of UK's Joint Information Systems Committee.

> All scientific publishers understand several truths: 1) that their content is generated in large part through federally funded research, 2) that the peer review process is carried out in large part by federally funded individuals, and 3) that a significant portion of their subscription revenue is obtained from government funded institutions. Many publishers believe they have an obligation to give something back to the public that has provided those funds, and they make their online content free after a short delay under subscription control. However, a few large, highly profitable publishers have refused to do this, and have thus forced the NIH into the position of mandating deposition of NIH-funded research publications in PubMed Central to make them available to the public.[26]

For some time, the Rockefeller University Press, like a growing number of other journal publishers, has taken a forward-looking approach, depositing their journals in PubMed Central and permitting public access after a six-month embargo.

In the long course of considering the NIH Public Access Policy, no evidence has ever been presented that journals whose articles are available via PubMed Central have been rendered unable to financially sustain themselves. Some publishers have pointed to the heavy use of articles in the years after lapse of the PubMed Central embargo, suggesting this demonstrates that PubMed Central will reduce the value to them of the articles—and thus NIH should compensate them. However, publishers receive most of their revenue based on pre-paid subscriptions to journals, not use of articles. Their revenue does not increase with any particular shape of a usage curve.

No Impact on Copyright Disposition or US Copyright Law

Some opponents of the policy continue to claim that the NIH policy interacts adversely with U.S. copyright law. To the contrary, the NIH policy does not create a statutory exception or limitation to an investigator's copyright. It merely requires the agency to condition its grant of funding on the investigator's agreement to provide PubMed Central with a copy of his article for the purpose of making the article publicly available via PubMed Central.

If an investigator chooses not to receive NIH funding, he need not provide his article to PubMed Central. But if he elects to receive NIH funding, he must accept certain reasonable conditions, including deposit of the article with PubMed Central so that the article can be made publicly accessible. This condition serves the interests of the public, which funded the research, and of NIH, which depends on awareness of and application of its research findings to drive medical advances.

The policy also does not implicate the publisher's copyright. Many STM publishers require the investigator to transfer the copyright in the article as a condition to agreeing to publish the article. If, as a condition of receiving NIH funding, the investigator grants NIH a non-exclusive license to use the article, then the copyright the investigator subsequently transfers to the publisher is already subject to this license. This means that the proposed provision does not change the scope of the publisher's copyright *after* the publisher has acquired it. Rather, the investigator will have agreed to grant PubMed Central a license long before the publisher even enters into the picture.

Contrary to the suggestion of some publishers, the NIH policy does not constitute a "compulsory license" or a "taking." A compulsory license arises when the statute requires the copyright owner to permit others to use his work without his authorization. By contrast, under the NIH policy, the

[26] Michael Rossner, letter to Tevi Troy, Deputy Secretary, US Department of Health and Human Services, Feb. 26, 2008. Available at http://publicaccess.nih.gov/comments/files/DHHS_letter.doc.

copyright owner retains complete control of his work, unless he chooses to accept NIH funding. The proposed provision simply provides that, in exchange for public funding, the investigator must deposit a copy of the articles stemming from that funding with PubMed Central so that NIH can make it publicly available.

Significantly, there is nothing unusual about a federal agency placing conditions on its funding of research projects. These conditions relate to a wide range of issues, including intellectual property rights. The policy is consistent with this tradition.

No Impact on International Agreements
Several publishers have argued that the NIH Public Access Policy would violate U.S. treaty obligations under Article 13 of TRIPS and Article 9 of the Berne Convention, and potentially constitute a "compulsory license." These arguments have no merit. The policy concerns contract terms, not copyright exceptions. As such, it in no way implicates Article 13 of TRIPS or Article 9 of the Berne Convention, which address permissible copyright exceptions. These treaty provisions are completely silent on the issue of the terms a funder or other licensee can require of a copyright owner in exchange for valuable consideration.

Properly Placed Compliance Responsibility
By providing for deposit of articles by funds recipients, the policy correctly recognizes that the only operative legal relationship that can support the long-term preservation of articles in PubMed Central is the relationship between the grantee or contractor and NIH, as framed by the agency's award terms. Investigators have the option of either depositing their final peer-reviewed manuscript in PubMed Central as soon as it has been accepted for publication or publishing it in a journal that will deposit the article on their behalf.

It is the singular responsibility of the recipient of federal funds to ensure compliance with federal grant guidelines and requirements. The publisher cannot and should not be presumed to have inserted itself into the relationship between the federal government and the funding recipient, where the sole responsibility for grant compliance and accountability resides. The publisher has no obligation or incentive to cooperate. There is no assurance that publishers will actually comply, now or in the future after close public and Congressional scrutiny has faded.

Reasonable Expectations of Researchers Grant Recipients
In the near term, author/investigators will be required to navigate new territory to retain rights in their publication agreements consistent with their NIH public access obligation. However, NIH and campus education programs are well underway and can be expected to facilitate compliance in the months ahead.[27] Also, there are several legally vetted and well-publicized addenda forms that authors may attach to journal publishers' copyright agreements to ensure retention of rights to deposit in PubMed

[27] The NIH requirement that applications, proposals, and progress reports must include the PubMed Central reference number when citing an article will spur vastly expanded awareness of the policy. In addition, a substantial number of institutionally organized educational efforts are underway, some of which are listed in the Association of Research Libraries' web resource, "NIH Public Access Policy: Guide for Research Universities," at http://www.arl.org/sc/implement/nih/guide/nih-resources.shtml. NIH-sponsored Public Access communications and training activities are listed at http://publicaccess.nih.gov/communications.htm.

Central.[28] The need of an author to comply with the NIH policy will certainly not influence acceptance an article by any reputable journal.

Many research universities also can be expected to take steps ensuring their investigators have the right to deposit their works in PubMed Central. Several strategies for institutional action have been outlined in a recent white paper by Prof. Michael Carroll of Villanova University law school.[29] Harvard University set an example of institutional action recently when the Faculty of Arts and Sciences voted to give the university a worldwide license to make each faculty member's scholarly articles available and to exercise the copyright in the articles, provided that the articles are not sold for a profit, ensuring the university has the rights necessary to provide NIH with articles arising from the agency's funding.[30]

In addition, there is every reason to believe that publisher policies will quickly adapt to recognize the needs of their authors and thus streamline the process. This is no different than journals' virtually universal recognition in their publication agreements that works by U.S. Government employees are in the public domain. It is safe to say that publishers, as a practical matter, will likewise implement contractual provisions acknowledging the NIH Public Access requirement.

Even before the NIH policy, a growing number of publishers had begun permitting authors to offer access to their articles in open online repositories such as PubMed Central.[31] And in just the past several months many publishers have adapted their agreements in response to the NIH policy.[32] BioOne, an online publishing platform used by approximately 140 biosciences journals, has recently released a model publication agreement that would grant publishers an exclusive right of first publication and a perpetual, non-exclusive right to distribute articles while also allowing authors to deposit their work in digital repositories such as PubMed Central directly or permitting the publisher to deposit to the National Library of Medicine on their behalf.

NIH's taxpayer obligations are perhaps hastening the reshuffling of rights in articles, but the overall change is part of a larger process set in motion by the capabilities of the Internet. An example is Rockefeller University Press, which recently acknowledged the need for journal publishers to revise their perspective on copyright in the Internet age by announcing a new copyright policy under which authors will retain the copyright to their published work and are obliged only to attribute the work to its original publication. Six months after publication, third parties can use the material under the terms of a Creative Commons license, which will allow computational and other reuses.[33]

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[28] See, for example, the Science Commons Scholar's Copyright Addendum Engine at http://scholars.sciencecommons.org/.

[29] Michael Carroll, "Complying with the National Institutes of Health Public Access Policy: Copyright Considerations and Options," published by SPARC, the Association of Research Libraries, and Science Commons. Available at http://www.arl.org/news/pr/carroll-paper-29feb08.shtml.

[30] "Harvard to collect, disseminate scholarly articles for faculty," *Harvard University Gazette Online,* Feb. 13, 2008. Available at http://www.news.harvard.edu/gazette/2008/02.14/99-fasvote.html.

[31] A current summary of rights retained by authors as part of each publisher's copyright agreement is available at http://www.sherpa.ac.uk/romeo.php.

[32] The Edward G. Miner Library of the University of Rochester Medical Center has posted a selective list of publishers' policies issued in response to NIH's Public Access policy. See http://www.urmc.edu/hslt/miner/research_and_publishing/PublishersPoliciesonPubMedCentralMinerLibrary.cfm.

[33] Emma Hill and Mike Rossner, "You wrote it; you own it!" *Journal of Cell Biology*, Vol. 181, No. 3, pp. 405-406, published online April 30, 2008. http://www.jcb.org/cgi/content/full/jcb.200804037.

Upholding the Peer Review Process

The NIH policy is careful to avoid any negative impact on the continuity of journal subscriptions and, more importantly, the peer review process.[34] The PubMed Central access embargo leaves journals as the exclusive source of access for up to 12 months. Few journal subscribers are prepared to wait this long to know about the latest research in their field. While SPARC believes 12 months is an excessive delay, we recognize that an embargo of some duration may be necessary—at least for the time being—as a means to balance important interests.[35] The embargo is a blunt, unambiguous means of guaranteeing the journal's uniqueness while ensuring that research eventually becomes widely available.

An abundance of data on prestigious and profitable publishers demonstrates that when access to journals is available free after as little as a two-month embargo, neither institutional nor individual subscription renewal rates are materially affected. A survey of libraries by a publisher organization, the Association of Learned and Professional Society Publishers (ALPSP), reinforces this experience, indicating that the vast majority of librarians are not considering canceling journal subscriptions in response to public availability of research.[36] Moreover, many commercial and nonprofit publishers today allow authors to immediately archive their accepted articles under terms and conditions substantially similar to those proposed for NIH.

In fact, more than 340 journals have made their articles available via PubMed Central, with embargoes ranging from zero to 12 months, without being forced out of business. Several have publicly shared their positive experiences, including the American Society for Cell Biology, which since 2001has made its journal, *Molecular Biology of the Cell*, available on PubMed Central after only a two-month embargo. Despite this "liberal" access policy, the journal has profited and grown. Similarly, the American Society for Microbiology, publisher of 11 journals (including *Molecular and Cellular Biology, Journal of Virology,* and *Eukaryotic Cell*), recently reduced the embargo period on all of its primary research articles from six to four months, having decided on the basis of experience that such a move would not endanger the financial position of the society.[37]

Abundant Protection for Publishers' Interests

The embargo permitted by the NIH policy is just one of several ways in which journals are differentiated from PubMed Central. There are many other factors that underscore the continuing demand for journals in the era of public access, including these:

- The vast majority of research articles in most life sciences journals do not arise from NIH-funded research. This reinforces libraries' need to maintain their subscriptions to journals, which provide access to the articles that will not be available in PubMed Central. The ALPSP survey reported that for most librarians (76%) an archive would have to contain over 90% of the journal's content,

[34] It is important to recognize that, in virtually all cases, the peer review itself is done on a voluntarily basis by scientists. The publisher does not pay them; their institution and funders underwrite this contribution. The publisher role in peer review is to organize the solicitation of potential reviewers.
[35] SPARC has long advocated a six-month embargo as a compromise that better balances reasonable taxpayer expectations with publisher interests.
[36] Mark Ware. *ALPSP Survey of Librarians on Factors in Journal Cancellation.* Association of Learned and Professional Society Publishers (March 2006). Summary and conclusions available at http://www.alpsp.org/publications/libraryreport-summary.pdf.
[37] Gary Ward, "Deconstructing the Arguments Against Improved Public Access," *ASCB Newsletter*, vol. 29, no. 11 (Nov. 2006), p. 6.

and nearly half would need to see 100% duplication before they would view it as a potential substitute for a journal.

- Most journals publish a great deal more content than just research articles, which are the only component required to be deposited under the NIH policy. Many journals also offer letters, editorials, opinion pieces, book reviews, news, and conference information. These value-added features will be found only in journals, not in online archives unless the publisher so chooses. Our member libraries are not apt to cancel subscriptions to journals that successfully deliver these kinds of value-added services.

- Under the policy, NIH captures only the author's final accepted manuscript—not the formatted, paginated, copyedited, published version of the article preferred by authors for citation purposes—unless the publisher consents. While the quality of papers included in PubMed Central has been certified and they are suitable for use by individual taxpayers, most scientists and researchers in institutional settings will insist on access to the most authoritative version published in journals. Many commercial and nonprofit publishers have already acknowledged the safety and utility of multiple versions by allowing authors to immediately self-archive the penultimate peer-reviewed version of an accepted article under terms and conditions substantially similar to those proposed for NIH.

- Researchers use PubMed Central in ways that differ greatly from their journal reading. As part of NIH's richly interlinked system, articles in PubMed Central are integrated with comprehensive links to the world's biomedical journal literature and other resources such as DNA and protein sequence databases, 3D protein structure and protein domain data, population study datasets, expression data, assemblies of complete genomes, and taxonomic information. This unique environment enhances users' ability to follow a research thread and is part of what makes PubMed Central a uniquely useful and important research tool. However, it is *not* a replacement for the convenience of browsing a journal.

Timely public access to NIH-funded research findings via PubMed Central will leverage the federal investment without undermining longstanding business interests. Experience in other fields has demonstrated that online archives do not displace journals. For example, most new articles in physics are freely available from their creation in the arXiv (http://www.arxiv.org/) open-access archive, developed in the early 1990s with U.S. Department of Energy funding and in continuous operation since then. Yet subscription-based physics journals have continued to thrive, indicating that open archiving is not a threat to journals. The American Physical Society and Institute of Physics Publishing are unable to identify any subscriptions lost as a result of arXiv in its entire existence.[38]

Potential Policy Enhancement

We believe that a maximum 12-month embargo on public access is too long and a six-month maximum is a better balance of important interests. Six months allows adequate time for publishers to recoup their costs while ensuring that research is widely available while it still is useful.

SPARC has no less a stake than publishers and the NIH in supporting the review of scientific research to ensure its quality. We are confident that a policy requiring public access within six months of first publication does not fundamentally threaten the ability of journals to sustain themselves and the

[38] Key Perspectives. *Open access self-archiving: An author study* (May 2005), p. 3. Available at http://www.keyperspectives.co.uk/openaccessarchive/reports/Open%20Access%20II%20(author%20survey%20on%20self%20archiving)%202005.pdf.

research certification process they orchestrate. As stated previously, there is no credible evidence of a risk to journals from an embargo of six months or less.

Monitoring of the Policy
We encourage the NIH to closely monitor key aspects of the Public Access Policy's implementation, including:

- *Experience of publishers with six-month or shorter embargos*: It is in the taxpayer interest to reduce the duration of the public access embargo to as short a period as possible. NIH should collect data on the sustainability of biomedical journals that offer open access within six months of publication in order to evaluate the potential to reduce the maximum PubMed Central embargo.

- *Extent to which eligible articles are captured in PubMed Central*: For the policy to succeed, it is imperative that deposit of articles from NIH-funded research be nearly universal. We trust the agency will track this and take reasonable, appropriate steps to ensure success.

Conclusion
The NIH Public Access Policy embraces the potential of the Internet to enable new and increased usage of NIH-funded research findings by millions of scientists, physicians and health clinicians, public health officials, patients, small businesses, students, teachers, and others. SPARC commends NIH for its vision and leadership in putting forward this important policy.

The essential elements of the policy are sound and should go forward as outlined in the current implementation. We urge NIH to monitor the rates of deposit, along with the experiences of publishers who choose a six-month or shorter timeframe. *If possible*, it should reduce the length of the access embargo or eliminate it altogether.

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