

Public Access to Scientific Information: Are 22,700 Scientists Wrong?

Mary M. Case

Almost 22,700¹ life-scientists from 158 countries around the world have expressed their discontent with the current system of scholarly communication and have pledged to do something about it. All these scientists have signed an open letter stating that as of September 1, 2001, they will publish in, review and edit for, and subscribe to only those journals that agree to make the contents of their titles available for free on a publicly accessible server, like PubMed Central (PMC), within six months of publication. Known as the Public Library of Science (PLOS)², this grassroots movement has the potential to effect significant change in access to the biomedical and life sciences literature.

Proponents of the PLOS are strong believers in the notion that the results of publicly funded research should be freely available to the public. They find no justification for private ownership and control of the work they produce. While they acknowledge that publishers contribute to the final product through managing peer review and editing manuscripts, they point out that this contribution hardly matches the creative energy and time investment of researchers and the financial investment of funding agencies and home institutions. As stated recently by two of the founders of the PLOS, "Should the reward for the publishers' small contributions be permanent, private ownership of the published record of scientific research, and monopoly control over how, when and by whom a paper can be read or used and how much this access will cost? No!"³

A second fundamental precept of the PLOS is the call for centralized electronic archives of life-sciences literature. Centralized archives in standardized formats provide the foundation for sophisticated full-text searching across the literature, linking among articles from disparate sources, and linking to related databases, encyclopedias, textbooks, and other resources.

The PLOS initiative was founded by a small group of leading biomedical scientists, several of whom had been involved in the development of PubMed Central. PubMed Central itself was first proposed by Harold Varmus, then Director of the National Institutes of Health (NIH), in spring of 1999. First called E-biomed, the project was intended to "facilitate a community-based effort to establish an electronic publishing site." The essential feature of the plan was "simplified, instantaneous cost-free access by potential readers to E-biomed's entire content in a manner that permits each reader to pursue his or her own interests as productively as possible."⁴ The early version of E-biomed called for support of both peer-reviewed and non peer-reviewed articles and stipulated that copyright would remain with the authors. Criticism of E-biomed was instantaneous.

¹ As of May 21, 2001.

² <http://www.publiclibraryofscience.org>

³ Michael Eisen and Pat Brown, "Should the Scientific Literature be Privately Owned and Controlled?" Nature Webdebates. <http://www.nature.com/nature/debates/e-access/Articles/Eisen.htm>

⁴ "E-BIOMED: A Proposal for Electronic Publications in the Biomedical Sciences," May 5, 1999 (DRAFT) and June 20, 1999 (ADDENDUM). <http://www.nih.gov/welcome/director/ebiomed/53ebio.htm>

Among many complaints, critics charged that E-biomed would undermine peer-review and current journals, put the government in charge of an activity best left to the private sector, and erode the financial base of scientific societies. Varmus responded:

The system we propose is intended to make knowledge and ideas in life sciences widely and freely accessible to the scientific community and the public, in the tradition of free public libraries. In no sense should E-biomed be interpreted as a proposal to interfere with, control, or restrict the activities of existing journals or other vehicles for transmitting scientific information. Rather it is intended to develop new opportunities to improve the communication of science.⁵

Nevertheless, by the time E-biomed went online as PubMed Central in February 2000, a number of concessions to the critics, primarily publishers, had been made. Support for a non-peer-reviewed system was put on hold; peer-reviewed content could be submitted by publishers at any time after being accepted for publication; and copyright ownership would be determined by the participating groups (i.e., publishers, societies, editorial boards). What had started out as a project with the potential to revolutionize access to scientific literature had been significantly altered in the face of publisher pressure. At launch, despite the concessions, only two journals had issues available on PMC - *Molecular Biology of the Cell* and *Proceedings of the National Academy of Sciences (PNAS)*. To date, only 8 journals have issues available with another 10 listed as forthcoming.

In the fall of 2000, frustrated by the unwillingness of publishers to contribute their content to PMC, the group of bio-scientists decided that another strategy to achieve free access to the literature was necessary. If the publishers could not be persuaded by the NIH acting on behalf of scientists, perhaps they could be persuaded by the scientists themselves who provide the papers, and review and edit for the journals. Echoing Varmus' words, the group took the name Public Library of Science and developed an open letter that they began circulating via e-mail to scientists around the world.

Not surprisingly, when news of this effort was made public in early 2001, the debate was reignited. While many publishers described the goal as laudable and even inevitable, they were not inclined to participate. Many publishers believe that there is no need for central repositories, especially one run by the government. Government control, it was argued, could lead to suppression of research results on controversial topics and to uncertainties in funding as Congressional priorities change. As *Science* and many HighWire publishers have demonstrated, publishers may be willing to make their articles available for free on their own sites, but they are not eager to turn their files over to another entity.⁶ They worry that the transfer of files to a third party will result in the corruption of files and compromise the quality of articles. In addition, they say, in the Internet environment a central archive, like PMC, is not needed for access across publisher resources. Searching across distributed systems is currently possible and such services as CrossRef link

⁵ Ibid.

⁶ In a response to the PLoS, the Editors of *Science* stated that they would make original research reports published in *Science* available for free after a year on their own website. "Is a Government Archive the Best Option?" *Science*, Mar. 23, 2001: 2319.

citations among participating publishers. Moreover, access to their articles at a third party site could undermine the ability of publishers to attract advertising dollars to their own websites.

Small society publishers are concerned that in disciplines where the drop-off in use over time is gradual, libraries will depend on the free access provided through the central archives rather than subscribe. In those cases, the journal may either have to cease publication or significantly increase the subscription price to its remaining subscribers.

The proponents of the PLoS have always said that PubMed Central is only one of a number of possible entities that could serve as an archive. In fact, some measure of duplication is desirable as a hedge against downtime, system crashes, and heavy network traffic. The PLoS has no intention of substituting one set of monopolies with another. They point to the example of GenBank, the public archive of DNA sequences, as a centralized repository in a single format which has generated a rich array of searching software and linked resources. But GenBank is also duplicated at two other sites, one in Europe and one in Japan. Sequences can be deposited at any of the three sites, and the sites are synchronized daily. GenBank is housed and managed at the National Center for Biotechnology Information (NCBI), a unit of the National Library of Medicine and the NIH, and has never faced a problem with funding. There is little reason to believe that if scientists support it, PMC would not also be fully supported.

PMC is also highly unlikely to have any influence on the editorial policies of archived journals. The role of the government in this case is to provide the technical infrastructure and provide financial support. Editorial boards will exercise the judgment about what is published in their journals and subsequently submitted to PMC. In terms of publishers' concerns about the integrity of the files when transferring them to a third party, NCBI Director David Lipman notes that PMC has actually detected data tagging errors in some of the files contributed by publishers. The result has been enhanced quality of the papers at both the publisher's and the PMC site.⁷

In recognition of the possible effect that viewing an article on a third party site could have on advertising revenues, the PMC recently announced a new policy that would encourage publishers to submit their content, but would protect their financial interests. The PMC would integrate the content into the PMC site for purposes of searching, linking, and archiving, but would pass the user on to the publisher's site for the full text of the article. PMC reserves the right to make the content available through PMC for free if the publisher does not do so on its own site within a year of publication, although six months is preferred.⁸ According to the PLoS, "This proposal . . . provides a good test of the publishers' real intentions."⁹

To allay the financial fears of the societies, the PLoS cites the examples of *PNAS* and *Molecular Biology of the Cell*, both of which make their articles available on PMC two

⁷ Julia Karow, "Publish Free or Perish: Life Scientists Are Urging Publishers to Grant Free Access to Archived Research Articles," *Scientific American*, April 23, 2001.

<http://www.scientificamerican.com/explorations/2001/042301publish/>

⁸ "New Option to Display Full Text at a Journal Site Only"

<http://www.pubmedcentral.nih.gov/about/newoption.html>

⁹ Public Library of Science, "Response to *Science* Magazine's Statement Regarding this Initiative."

<http://www.publiblibraryofscience.org/plosScienceRep.htm>

months after publication. After a year, neither title has lost subscriptions.¹⁰ This is an area, however, in which librarians can make an important contribution to the success of the PLoS movement. Libraries could reduce the risk for societies by pledging to continue to subscribe to society titles that make their content available for free after six months and keep their prices at reasonable levels.

Libraries can also help in a number of other ways. First, find out who on your campus has already signed the Open Letter. Names and institutions are available on the PLoS website. Talk with these faculty, listen to their rationale, and encourage them to talk with others in their departments. Second, provide the entire biomedical and life sciences faculty with information about the PLoS and issues in scholarly communication. Provide the names of their colleagues who have signed the letter and may be willing to discuss it with them.

Third, be prepared to provide or suggest alternative venues for faculty to publish in as of September 1. If publishers believe faculty have no other options, they have no real incentive to change their practices. Publishers can wait until September 1 and see what happens when 23,700+ scientists suddenly have no where to submit their papers. While you want to be sure to keep track of the publishers that have joined PMC, they may not on their own be able to absorb all of the new submissions. The leadership group of the PLoS has recognized this dilemma and is in the process of seeking out alternative publishing vehicles. In the meantime, it is important to explore with your faculty the possibility of setting up independent editorial boards. The PMC will accept submissions from such groups as long as three members of the board are currently principal investigators on research grants from major funding agencies. The library could play an important role in supporting the formation of such new "journals" and providing technical support and infrastructure.

Another important action the library can take is to cancel titles that do not agree to support the goals of the PLoS. If your faculty have signed the Open Letter and alternative journals are launched, it is time to cancel those that choose to ignore the interests of the scientists they are intended to serve.

For years, librarians have worked to engage faculty in discussing the issues in and exploring possible solutions to the scholarly communication crisis. While there may be disagreements with the precepts of the PLoS, the life-sciences community has clearly signaled what they desire in a system of scholarly communication: peer-review, free public accessibility, timeliness, flexible searching and extensive linking, and assured archiving. The PLoS is a challenging new approach to the crisis in scholarly communication and deserves the library community's attention and support.

Mary M. Case is Director of the Office of Scholarly Communication, Association of Research Libraries, and a member of the Public Library of Science Advocacy Group.

¹⁰ Ibid.