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December 16, 2011

Re: OFFICE OF SCIENCE AND TECHNOLOGY POLICY (OSTP) – Request for Information:
Public Access to Peer-Reviewed Scholarly Publications
Resulting from Federally Funded Research

On behalf of Carnegie Mellon University (CMU) and the roughly 4,000 faculty and staff we represent, I write to thank you for this opportunity and to share our perspective on public access to peer-reviewed publications resulting from federally funded research. Carnegie Mellon is a small, private university with over 11,000 students and 86,500 alumni. Recognized for our world-class programs in technology and the arts, interdisciplinary collaborations, and leadership in research and education, we are innovative and entrepreneurial at our core.[1]

In September 2011, the Times Higher Education World University Rankings placed Carnegie Mellon at 21 overall and 12 in science and engineering. In August 2010, Unigo.com included CMU among the New Ivies. In 2007, the Academic Analytics Faculty Scholarly Productivity Index ranked us 4 overall, and in the top ten in nineteen disciplines, including 1 in information technology / systems; 2 in cognitive science, operations research, business, and public administration; and 4 in electrical engineering, computational science, and computer science.[2] Eighteen of our faculty and alumni have won Nobel Prizes. We firmly believe that open access to publicly funded research will increase productivity, innovation, and commercialization.

COMMENT 1

To maximize return on taxpayer investment in research, grow the economy, and improve the productivity of science, all federally funded peer-reviewed publications should promptly be made available to the public for full use without commercial restrictions. Full use entails not just the right to read and download the work, but the right to distribute, mine, crawl, create derivative works, and use in computations.

[1] See http://www.cmu.edu/about/index.shtml.
[2] See http://www.cmu.edu/about/rankings-awards/rankings/rankingsroundup.pdf.

Mandating prompt public access and full use rights – open access – to peer-reviewed scholarly publications will benefit not only higher education and research institutions, but small business owners, practitioners, and inventors currently hindered by cost barriers. Open access will grow existing and new markets by accelerating and broadening access and increasing use of the material. Faster access enables ideas to be generated and applied more quickly, speeding up the development cycle, creating jobs, and stimulating economic growth. Broader access enables more users and different kinds of users to stay on the cutting edge, encouraging innovative use and application of the work. As Google and other search tools demonstrate, public access and use rights encourage private investment and job creation. In contrast, restricted use stifles innovation and limits commercialization. Mandating public access and full use rights will maximize opportunities, encourage investors, and enable creative individuals and companies to build new products and services.

The factors that stimulate economic growth will also improve the productivity of science. Open access drives innovation and productivity by broadening access (and hence potential for interdisciplinary work), increasing use (evidenced by increased citations[3]), and accelerating development. Full use rights will add to this benefit by allowing scientists to use computers to process research findings, enabling them to use new findings in new ways (e.g., machine reading and computation) and to process more information faster, speeding and expanding opportunities for innovation and commercialization. The National Institutes of Health (NIH) reports that most of the 500,000 daily users of articles in PubMed Central are unforeseen users, i.e., not researchers in the .edu Internet domain.[4] Enabling unforeseen users and uses of federally funded scholarly publications will inevitably increase scientific productivity and commercialization of the findings. To maximize the number of people with the opportunity to contribute, the U.S. government must adopt mandatory open access policies.

The social and economic benefits of providing fast, free access and full use rights will far exceed the financial cost of ingesting, maintaining, and providing access to the content. The NIH spends less than 1% of its annual budget processing submissions, refining the system, staffing a help desk, and maintaining its database of two million articles.[5] **According to the Houghton report, *Economic and Social Returns on Investment in Open Archiving Publicly Funded Research Outputs*, over a transitional period of 30 years from implementation, open access to all federally funded scientific research modeled on the NIH policy will increase return on taxpayer investment by at least a factor of four and grow the U.S. economy by**

[3] See, for example, C.J. MacCallum and H. Parthasarathy (2006), "Open Access Increases Citation Rate," *PLoS Biol*ogy 4(5): e176. doi:10.1371/journal.pbio.0040176. See also the bibliography available at http://opcit.eprints.org/oacitation-biblio.html.

[4] D.J. Lipman (April 19, 2011), Testimony on Public Access to Federally-Funded Research. See http://www.hhs.gov/asl/testify/2010/07/t20100729c.html. Lipman reported that approximately 25% of PubMed Central use comes from universities, 17% from companies, and 40% from the public sector. The remaining 18% is government or other users.

[5] Lipman, 2011.

roughly a billion dollars.[6] Following the transitional period, the benefits of steady-state open access would be more than 50 times the cost. Federal public access mandates that expand on the NIH model to include full use rights will increase return on investment and grow the economy even more by allowing innovative uses and accelerated processing previously prohibited without permission.

Open access publishing and self-archiving are more cost-effective systems for scholarly publishing than toll access (subscription) publishing, offering cost savings throughout the scholarly communication process. According to the Houghton and Oppenheim et al report, *Economic implications of alternative scholarly publishing models*, "there are gains to be realized from moving towards open access publishing models and, despite the lag between the costs and the realisation of benefits, the transition may be affordable within existing system-wide budgetary allocations."[7] (See comment #9.) Transition cost has long been a key concern of academic administrators.

Federal public access policies can be implemented cost effectively by leveraging existing infrastructure and expertise. (See comments #3 and #4.) Furthermore, public access will provide data for federal agencies to assess return on investment and to target funding to the most promising research. Mandated public access is the appropriate federal response in an era calling for fiscal accountability, evidence-based decision making, and transparency.

COMMENT 2

Public access policies can be implemented within the current copyright framework. All that is needed to maximize return on taxpayer investment in research is an emphasis on author rights and appropriate licenses.

The NIH public access policy allows only limited use of the material. Greater utility is needed to realize the potential scientific and commercial value of federally funded research findings. Public access policies must enable full use of publicly funded work (i.e., the right to copy, distribute, re-use, crawl, create derivative works, mine text and data, and use in computation) in a timeframe much shorter than the copyright term. This can be accomplished under current copyright laws by implementing licenses that do not restrict use, for example, the Creative Commons CC-BY (attribution) license. To

[6] J. Houghton, B. Rasmussen, and P. Sheehan (July 2010), *Economic and Social Returns on Investment in Open Archiving Publicly Funded Research Outputs*, Report to SPARC, pp. 7-8. Available at http://www.arl.org/sparc/bm~doc/vufrpaa.pdf. According to the report, if calculations are based on federal R&D lifecycle costing, the benefits of open access will be four times the cost. If calculations are based on the NIH's costing, the benefits will be eight times the cost. If calculations are based on arXiv costing, the benefits will be 24 times the cost. These calculations are based entirely on increased returns to R&D. Savings in time spent searching or acquiring materials or duplicating research are not included.

[7] J. Houghton, C. Oppenheim, et al (January 2009), *Economic implications of alternative scholarly publishing models: Exploring the costs and benefits*, A report to the Joint Information Systems Committee (JISC), p. 14. Available at: http://www.jisc.ac.uk/media/documents/publications/rpteconomicoapublishing.pdf.

balance the interests of various stakeholders, a reasonable compromise would be an embargo period of restricted access and use, followed by public access and full use under an appropriate license. (See comment #8.)

Federal agencies need to understand what is at stake in articulating a public access policy from different stakeholder perspectives, and where in the supply chain each stake is claimed. In short:

- The public's stake in federally funded research is rightfully claimed at both the beginning and end of the supply chain. Taxpayers have a stake in how their tax dollars are invested in research – a driver for transparency and accountability – and a stake in access to the research findings funded with their tax dollars.
- Federal agencies have a stake in ensuring that their investment of taxpayer dollars yields maximum return. (See comment #1.)
- Intellectual property owners have an important stake in public access policies. The initial copyright owner of federally funded research findings is probably the author or perhaps the author's employer. Publishers are not the initial copyright owners, though they have a stake downstream of the authors' copyrighted expression of research findings. Authors are primarily interested in securing recognition and a reputation for advancing knowledge. Publishers are primarily interested in revenue.
- Academic institutions bear all the real costs of performing peer review by paying faculty salaries and providing office and laboratory space. In return, they have a right to expect broad dissemination and innovative use of research findings, in keeping with their mission. Publishers only coordinate peer review.

Federal public access policies must require initial copyright owners to grant the government the right to archive, distribute, and enable full use of their publicly funded work. Creative Commons licenses should be considered standardized terms of use. The right to license full and public use is enforceable under current copyright law.[8]

Traditionally publishers required authors to transfer their copyrights exclusively to them, to ensure their investment in publication and dissemination was profitable. Authors complied because they had no alternative when work was disseminated in print. The Internet dramatically changed the situation. Now authors have open access alternatives. They can publish in journals that allow them to self-archive their work in an institutional or disciplinary repository (known as green open access), or publish in open access journals (gold open access). At Carnegie Mellon University, roughly 83% of the faculty and graduate students have self-archived their work or published in an open access journal.[9] The Houghton and Oppenheim report indicates that both green and gold open access are more cost effective ways of disseminating scholarly work than subscription (toll access) publishing.[10]

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[8] See http://creativecommons.org/weblog/entry/8826.

[9] J. Sutkus (2010), *Faculty Survey of Library Resources 2009-10* and *Graduate Student Survey of Library Resources 2009-10*, Carnegie Mellon University: Office of Institutional Research and Analysis. See also D. Troll Covey (2011), "Recruiting Content for the Institutional Repository," *Journal of Digital Information* 12, 3. Available at http://works.bepress.com/denise_troll_covey/56/.

[10] Houghton and Oppenheim et al, 2009.

As of December 2011, 57% of the 1,043 publishers with policies in the SHERPA RoMEO database allow self-archiving of peer-reviewed articles without an embargo.[11] A small percentage allows self-archiving after an embargo period. In addition, many publishers support public access policies by depositing work in designated repositories for the authors. In 2009, 40% of the articles submitted to PubMed Central were deposited directly by the publisher. In April 2011, the NIH reported having formal agreements for direct deposit with more than 900 journals, "a number that has doubled in the two years since the policy became mandatory." The number is expected to grow.[12]

In addition to self-archiving, open access publishing is thriving. As of December 2011, the Directory of Open Access Journals (DOAJ) lists 7,000 journals; roughly four new titles are added daily.[13] DOAJ statistics indicate 1,432 open access titles added this calendar year.[14] Many open access journals are published by scholarly societies. According to the *SPARC Open Access Newsletter*, in 2007, 425 scholarly societies published 450 open access journals; in 2011, 530 societies publish 616 open access journals. Roughly 20% of these journals are published in the United States.[15] Open access is a growth industry and grand opportunity in publishing. Even traditional toll access (subscription based) publishers – including Elsevier, Nature, Sage, Springer, Taylor & Francis, and Wiley-Blackwell – are joining the movement, either by providing a fee-based open access option for publishing in subscription journals (known as hybrid journals) or, more recently, by publishing fully open access journals.[16] Open access publishing creates competition, ultimately yielding better (more effective) products at better prices. The Study of Open Access Publishing (SOAP) project found that

- At least 120,000 articles are published in fully open access or hybrid journals each year.
- Most open access articles are published by for-profit publishers.
- Two-thirds of open access journals and 75% of open access articles are STM.
- Fourteen publishers published roughly 72% of the open access journals and articles. A vast majority (82%) of these articles are published under a Creative Commons Attribution (CC-BY) license – granting the full use rights recommended here as critical to maximize the return on taxpayer investment in research.[17]

There is no evidence that libraries have cancelled journal subscriptions because some of the articles are available open access. However, should publishers see reduced revenue as a result of open access, "these reductions may well be offset by revenue gains from selling value-adding services to a larger number of readers and/or authors

[11] See http://www.sherpa.ac.uk/romeo/statistics.php.

[12] Lipman, 2011.

[13] H. Morrison (September 30, 2011), *Dramatic Growth of Open Access*. See http://poeticeconomics.blogspot.com/2011/09/dramatic-growth-of-open-access.html.

[14] See http://tinyurl.com/85bvfrf.

[15] See http://www.earlham.edu/~peters/fos/newsletter/12-02-11.htm.

[16] See http://www.sherpa.ac.uk/romeo/PaidOA.html.

[17] S. Dallmeier-Tiessen, R. Darby, B. Goerner, et al (2010), *First Results of the SOAP project. Open access publishing in 2010.* Available at http://arxiv.org/ftp/arxiv/papers/1010/1010.0506.pdf.

and from alternative revenue streams."[18] Furthermore, open access creates jobs across a broad spectrum of content, from peer-reviewed scholarly communications to user-generated social networking, e.g., from the Public Library of Science (offices in San Francisco and the UK) and Hindawi Publishing (offices in New York and Cairo) to You Tube, Flickr, and Facebook.

Despite ongoing publisher push-back on open access to scholarly work, increasingly publishers are leveraging open access to their financial advantage. **The U.S. government should not concern itself with preserving business models that no longer serve the best interests of authors and readers.** It should focus on supporting new business models that serve these interests, for example, by funding Article Process Charges (APCS) for authors to publish in fully open access journals. Publishers have a legitimate claim to the formatted, copyedited, published version of a work. They might have a claim to the peer-reviewed author's manuscript version, though given that publishers coordinate peer review (for which publishers expect remuneration) and academics perform peer review (funded gratis by their institution), the academy also has a claim to the peer-reviewed manuscript.[19] **What publishers cannot rightfully claim is that federal mandates result in the government's taking of private sector products.** If initial copyright owners choose not to transfer their copyrights to certain publishers, for whatever reason, that is their prerogative as copyright owners. If publishers choose not to support the rights authors need to comply with federal mandates, for whatever reason, that is their prerogative as publishers. Federal mandates do not take private sector products, but rather encourage authors to choose wisely in their own, their institution's and the public's interest.

Initial copyright owners – primarily authors – need to be educated, empowered, and required to steward their copyrights wisely. They must retain and license the rights necessary to comply with federal public access policies.

COMMENT 3

The federal government should be responsible for stewarding federally funded research findings. The government is in a unique position to ensure that the collections are permanently preserved, publicly accessible, and fully usable. The government should keep a copy of all research findings they fund. However, each agency need not maintain its own repository and additional repositories are necessary. These two

[18] Houghton and Oppenheim et al, 2009, p. 16.

[19] Houghton and Oppenheim et al provide an analysis of the cost of producing a journal article:

- 15% of the total item cost is the performance of peer review
- 55% is research and writing
- 30% is publisher related activities
- <1% is library acquisition and handling

A subsequent analysis reveals that universities fund 80% of the cost of peer review. Given that universities and funding agencies fund most of the costs of producing a journal article, they have a legitimate claim to the peer-reviewed manuscript. See Houghton and Oppenheim et al, 2009, pp. 6-7.

caveats insure the cost effective implementation of public access policies and the redundancy necessary for long-term preservation.

The government must maintain a repository of all federally funded content because current market attempts to archive collections comprehensively are inadequate. For example, Cornell University recently reported that only 13% of their journal holdings are currently archived by LOCKSS and Portico.[20] Many publishers do not participate in LOCKSS or Portico, either because they do not meet the technical conditions required by these archives or because the publishers do not respond to requests from librarians that they participate. Furthermore, though the cost of maintaining a LOCKSS archive is reasonable, licensing restrictions imposed by the publishers limit what can be done with archived copies. The limitations render actual use of the copies prohibitively expensive.[21] Cornell and Columbia Universities currently treat their LOCKSS caches as dark, inaccessible archives.

Experience has demonstrated that maintaining a dark archive is not a viable preservation strategy. Without access and use, media degrade, files corrupt, and formats slip into obsolescence. Delays in discovering these problems render them difficult if not impossible to solve. Therefore repository content maintained by the federal government must be accessible and usable. Only regular access and use can ensure preservation and maximize the benefits of public access. Prompt access increases use in the short term, but long-tail use can be just as powerful, as evidenced by many successful Internet businesses, e.g., Amazon, eBay, iTunes, and Netflix.[22]

The federal government need not allocate additional funds to each agency to develop infrastructure in support of public access. Large agencies, like the National Science Foundation, Department of Agriculture, and Department of Defense can, like the NIH, earmark 1% of their budget to develop and maintain an open access repository. Smaller agencies can piggyback on these efforts, increasing the return on investment.

Though the federal government must maintain an accessible copy, there must be other copies of the material. The government's investment in archiving will not unnecessarily duplicate the effort and cost of other providers. Additional repositories are necessary to provide the redundancy critical to long-term preservation and the decentralization critical to fostering interoperability standards.

These other repositories can be maintained by other organizations in partnership with the government. However, the government must stipulate the conditions or criteria that partner repositories must meet to support public access policies. Specifically, all partner repositories must

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[20] Cornell University Library and Columbia University Library (March 2011), *Final Report of the 2CUL LOCKSS Assessment Team*, p. 17. Available at: http://2cul.org/sites/default/files/2CULLOCKSSFinalReport.pdf.

[21] See Cornell University Library and Columbia University Library, March 2011.

[22] See http://en.wikipedia.org/wiki/Long_Tail.

- Support public access to federally funded content
- Enable full use of the material as mandated by policy
- Commit to long-term preservation of the content
- Interoperate with other repositories of federally funded content

Complying with existing or emerging open standards that facilitate public access and allowing full and innovative use of the content will maximize return on taxpayer investment, grow the economy, and increase the productivity of science. As of January 2010, the interoperability developed by the NIH among its holdings was extremely beneficial, but the Scholarly Publishing Roundtable recommended interoperability with external repositories to maximize return on investment.[23] More recently, testifying before the United States House of Representatives, David J. Lipman, Director of the National Center for Biotechnology Information (NCBI), described the added value and enhanced return on investment derived from the NIH's interoperability with archives in the U.S., U.K. and Canada:

> For example, during the recent H1N1 flu pandemic, NCBI was the major site for collecting all of the known flu sequences. Within months, NCBI had over 20,000 sequences from around the world. Taking advantage of the deep integration among NCBI systems, a researcher reading a paper on the spread of drug-resistant variants of the flu sequences could, with the click of a mouse, compare the new isolates to all other flu variants and gain insights into the epidemiological consequences. With equal ease, the researcher could map the variant viral proteins to known 3D protein structures to see how the mutations affect binding of the antiviral drug.[24]

COMMENT 4

The work to date in support of a distributed system of interoperable repositories must not be overlooked. Federal agencies should leverage existing expertise, infrastructure, and standards by partnering with academic institutions and other organizations that have already invested substantial resources in open access repositories and long-term preservation of digital content. Publishers willing to provide repositories that meet the conditions for public accessibility, full use rights, interoperability, and long-term preservation of publicly funded work may also be suitable partners.

Under no circumstances should access to publicly funded content be restricted to a single site. This would conflict with full use rights, including the rights to copy and distribute (mirror or harvest) the content. The ultimate goal of public access policies is the creation of new knowledge, products, tools, and services achieved through enhanced dissemination, discovery, use, and preservation. Anything that disrupts or

[23] Scholarly Publishing Roundtable, (January 2010), *Report and Recommendations from the Scholarly Publishing Roundtable*, p. 13. Available at: http://www.aau.edu/policy/scholarly_publishing_roundtable.aspx?id=6894.
[24] Lipman, 2011.

denigrates freedom of access and use will stifle innovation and commercialization and reduce return on taxpayer investment.

COMMENT 5

If federal agencies mandate and enforce deposit in open access repositories that meet established baseline criteria, the sheer volume of publicly accessible and fully usable material will drive development of interoperability standards and tools and, in the process, create jobs.

Federal agencies should require federally funded research results to be managed using open standards that are widely supported, regularly updated by the research community, and designed to facilitate interoperability and re-use of the material. Standards will no doubt evolve over time, but the government in collaboration with partner institutions can compile and maintain a list of accepted standards. For example, to facilitate searching, linking, mining, etc. and to optimize re-use, the storage format should use an open-standard mark-up like XML, with a standard document type definition (DTD) like the National Library of Medicine's DTD. The storage format must enable use by computers, not just people.[25]

Metadata provides more than an item description. It is a tool to enable use, re-use, and content analysis. To maximize return on investment, metadata must be machine-readable and machine-interoperable. It must be coupled with an Application Programming Interface (API) to enable standards-based data exchange and harvesting. Repositories suitable for deposit of federally funded research results should support the Open Archives Initiative metadata harvesting standard (OAI-MH), the object reuse and exchange standard (OAI-ORE), and protocols like the Simple Web-service Offering Repository Deposit (SWORD) that facilitate automatic deposit of manuscripts in multiple repositories at once. The efficiency provided by SWORD will provide the necessary redundancy and increase compliance by enabling authors to deposit their work simultaneously in federal and institutional repositories.

Dublin Core is the minimum acceptable core descriptive metadata for publications. Explicit information about use rights must be included, preferably using a controlled vocabulary. Articles should be assigned a Digital Object Identifier (DOI) to ensure persistent identification, management, and linking. Similar unique identifiers are being developed for authors and institutions (e.g., Open Researcher and Contributor ID or ORCID). Descriptive metadata should also include attribution for funding organizations and grant IDs.

Developments in semantic metadata need to be encouraged, monitored, and adopted over time, for example, metadata that describe relationships between entities (using the

[25] PDF may be used for display purposes, but PDF is not an acceptable storage format because it does not support robust searching, linking, text mining, reformatting, etc., i.e., it reduces the utility and value of the work.

Resource Description Framework [RDF] or Web Ontology Language [OWL]) or build bridges between publications and underlying data. Federal agencies can support these developments by working with agencies invested in improving metadata interoperability, such as the Library of Congress (LOC), the National Information Standards Organization (NISO), and other standards organizations.

COMMENT 6

To minimize the burden on researchers, offices of sponsored research, and academic departments, federal agencies should mandate consistent public access policies and uniform deposit requirements across agencies. Consistent expectations and conditions for managing grants and research publications will reduce costs and complexity, save researchers and institutions valuable time, and increase the rate of compliance.

To maximize impact, federal public access policies should do everything possible to ensure compliance and to encourage innovative use and enhancement. **Author compliance should be quid pro quo for future funding.** Protocols and standards that streamline deposit and redundancy (e.g., SWORD, OAI-MH) are also critical to compliance. Developers should be made aware of opportunities to add value, for example, by creating tools that help users compile bibliographies or create author profiles, or enable universities to easily measure their research output or apply their brand. Added value features and functionality will encourage compliance.

COMMENT 7

Federal public access policies should apply to all royalty-free, peer-reviewed publications of research findings funded by taxpayer dollars. Conference proceedings in particular should be covered by public access policies because in some disciplines, such as computer science, conference proceedings are more highly valued than journal articles.

COMMENT 8

Prompt, free access with full usage rights will unlock value in publicly funded research unrealized to date because of barriers to access and restrictions on use. The Houghton reports calculate the financial effects of an embargo period between publication and self-archiving an open access copy. The shorter the embargo, the greater the gain, such that eliminating the embargo maximizes return on investment.[26] A twelve-month embargo over a twenty year period can reduce return on investment by 2% during a

[26] Houghton et al, 2010, p. 8.

period of transition from subscription to open access publishing; eliminating the embargo during this period can increase ROI by 3.6%.[27]

Immediate access to peer-reviewed work would maximize the scientific and commercial value of publicly funded research. An embargo of twelve months or less is an acceptable compromise for the near future while publishers transition from a toll-access to an open-access business model. A report released by the Scholarly Publishing Roundtable – a group of academic administrators, academic librarians, STM publishers, and researchers – recommends an embargo of from zero to twelve months, the period to be determined by the federal agency in consultation with researchers and other stakeholders.[28]

Some publishers and research communities have expressed reservations about an embargo of twelve months or less, claiming that one solution does not serve all disciplines. However, funding agencies and hundreds of journals in many disciplines around the world have adopted an embargo of twelve months or less, with no evidence of harm to publishers.[29] Publishers that previously expressed concern about such a short embargo recently changed their position with no untoward effects. For example, *Molecular Biology of the Cell* reduced their embargo from twelve to two months.[30]

Interviews with Carnegie Mellon faculty in 2006 suggested that researcher concern about self-archiving open access copies is driven by unfounded publisher laments that self-archiving will result in canceled subscriptions. Faculty concern is heightened for scholarly societies that rely on surpluses from subscription income to fund conferences and other initiatives.[31] A survey of librarians conducted by the Association of Learned and Professional Society Publishers (ALPSP) in 2006 revealed that faculty need, journal usage and price were the top three factors influencing journal cancellations. Few of the librarians surveyed would cancel subscriptions unless the embargo period was three months or less and the published version of record and 90% of the journal's content were available open access. When asked to project their views five years out (2011), 98% of the respondents said price would be an important or more important factor and the availability of open access copies would not be among the top three factors influencing journal cancellations.[32] A cost-benefit comparison conducted by Houghton

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[27] Houghton and Oppenheim et al, 2009, p. 14.

[28] Scholarly Publishing Roundtable, 2010, p. 12.

[29] See http://roarmap.eprints.org/ and http://highwire.stanford.edu/lists/freeart.dtl.

[30] Scholarly Publishing Roundtable, 2010, p. 12, ft. 25.

[31] Denise Troll Covey (2006). Unpublished report. *Preliminary Findings: Study of Carnegie Mellon Faculty Rights and Scholarly Communication Practices.*

[32] Among the librarians surveyed, 82% said the embargo would have to be three months or less; 92% said six months or less. Only 39% saw an open access copy of the author's peer-reviewed manuscript as an acceptable substitute for the published work. Almost half (48%) of the respondents wanted the entire journal to be available open access before they would see open access copies as a substitute for the journal; 76% said an open access archive would have to contain 90% of the journal content for open access to be an acceptable substitute for the journal See Marc Ware (2006), *ALPSP survey of librarians on factors in journal cancellation*, Association of Learned and Professional Society Publishers (ALPSP), pp. 2-3. Summary and conclusions available at: http://www.alpsp.org/ForceDownload.asp?id=53.

and Oppenheim et al in 2009 indicates that the benefits of open access resulting from increased access and efficiency are sufficient to cover the cost of open access without canceling subscriptions.[33]

Federal public access policies can encourage the transition from toll access to open access by mandating an embargo of twelve months or less. If different embargoes must be considered for different disciplines, the appropriate embargo should be determined by the federal agency in consultation with the research community based on a thorough, objective assessment of market conditions that carefully isolates the effect of the embargo independent of changes in price, competition, licensing practices, library budgets, and revenue from long-tail citations. Under no circumstances should the embargo period be determined by for-profit publishers.

COMMENT 9

To facilitate compliance with public access policies and the transition to a more cost-effective scholarly publishing system, federal agencies should fund payment of Article Process Charges (APC) for grantees to publish in fully open access journals. They should not fund payment to publish in hybrid journals. Hybrid journals constitute double dipping, with publishers securing both subscription revenue and an APC for the same content.[34]

The Study of Open Access Publishing (SOAP) project found that scientists and scholars overwhelming support the idea of open access because of its many benefits, but only 8-10% of articles published annually are published in open access journals. A large survey conducted by SOAP found that 29% of the respondents had not published a single article in an open access journal. Among those who provided reasons for their delay, the biggest deterrent was funding to pay the APC.[35]

Analysis conducted by Houghton and Oppenheim et al indicates that funding agencies and institutions could allocate 3.5% of their research funding to paying APCs without exhausting the net benefits of open access; 3.5% is much higher than reported allocations and much higher than what is required, based on careful estimates. The

[33] Houghton and Oppenheim et al, 2009, p. 12.

[34] As of early 2010, eighty publishers offered a hybrid option for a subset of their journals. However, few authors exercise this option, i.e., only 2% of the articles in hybrid journals are available open access. See S. Dallmeier-Tiessen, R. Darby, B. Goerner, et al (2010), *First Results of the SOAP project. Open access publishing in 2010.* Available at: http://arxiv.org/ftp/arxiv/papers/1010/1010.0506.pdf.

[35] S. Dallmeier-Tiessen, R. Darby, B. Goerner, et al (2011), *Highlights from the SOAP project survey. What Scientists Think about Open Access Publishing*, pp. 3, 7, 11. Available at: http://arxiv.org/ftp/arxiv/papers/1101/1101.5260.pdf.

benefits of open access and the system cost savings far outweigh the cost of diverting funds to pay APCs. [36]

Scholars in fields that are poorly funded need institutional support to pay APCs. Carnegie Mellon University is forming a Scholarly Communication Advisory Board to guide strategic initiatives. A high priority for the new Board is to explore how and under what conditions the University could underwrite APCs. Options include creating a fund to pay APCS (i.e., joining COPE, the Compact for Open Access Publishing Equity[37]) or paying for memberships that offer discounted APCs (e.g., PLoS or BMC membership [38]).

Open access journals are currently at a disadvantage compared to subscription journals. Publication fees levied by many open access journals are one of the reasons why authors who perceive the benefits of open access choose to publish in subscription journals. Subscriptions insulate authors from the attendant costs of publishing. The institution pays the toll by investing in research and in the library, creating what economists call a "moral hazard." Moral hazards arise when individuals are isolated from the consequences of their choices. When someone else is held responsible for the consequences, people tend to act less carefully than they otherwise would. In the current context, the university (through funding for the library) suffers the consequences, paying escalating prices for access to subscription journals.

Stuart Shieber of Harvard argues that funding agencies must take responsibility not only for funding important research, but for the optimal distribution of research findings. "Part of that responsibility is putting in place an economically sustainable system of underwriting open-access publication fees."[39] He outlines criteria that would enable funding agencies to underwrite APCs without introducing a moral hazard. For example, the government must:

- Level the playing field for open access journals by allocating funds that can only be used to pay APCs in fully open access journals, not hybrid journals.
- Recognize that research publications often occur after the grant period ends. Therefore the government must allow funds allocated for APCs to be spent after the grant period ends.
- Provide incentives for publishers to switch from toll access to open access publishing. This is why federal funds for APCs must ***not*** be used to publish in hybrid journals. To allow this would provide no incentive for publishers to transition to open access publishing.
- Avoid the moral hazard of insulating authors from the costs of publication. Fund APCs in full or in part up to a limit. A cap will encourage authors to choose low-cost, high-service open access journals.

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[36] Houghton and Oppenheim et al, 2009, pp. 13, 15.

[37] See http://www.oacompact.org/.

[38] See http://www.plos.org/support-us/institutional-membership/ and http://www.biomedcentral.com/libraries/membership.

[39] S. Shieber (November 16, 2011), "How should funding agencies pay open-access fees?", *The Occasional Pamphlet*. Available at: http://blogs.law.harvard.edu/pamphlet/2011/11/16/how-should-funding-agencies-pay-open-access-fees/.

In closing, the federal government is in an ideal position to support key, evidence-based recommendations made by Houghton and Oppenheim et al.[40] The government can help overcome barriers by paying the APCs of grantees publishing in fully open access journals, by funding and encouraging the development of interoperable open-access repositories, and by advocating for alternative publishing models. The government can help realize system-wide cost savings, maximize return on taxpayer investment, grow the economy, and increase the productivity of science by mandating open access and full use rights to federally funded research.

Sincerely,

Gloriana St. Clair

[40] Houghton and Oppenheim et al, 2009, p. 18.