

Real-Time Plant Physiology: My View of What's in It for Authors, the Journal, and ASPB

“Open Access” ensures free access of journal articles to anyone with a web connection. Open Access (OA) promotes accessibility by removing financial barriers for all potential audiences. Beginning with the January 2007 issue, all papers in *Plant Physiology* corresponding by ASPB members will be published with full Open Access. This means that anyone with an Internet connection anywhere in the world will have instant, full access to your paper as soon as it is published, i.e., *Real-Time Plant Physiology*. This includes full access to the publish-ahead-of-print version (*Plant Physiology Preview*) as well as to the final, fully edited version, full access to supplemental data, and full access to all the advanced linking and tracking tools.

Real-Time Plant Physiology offers authors higher impact. OA offers authors a larger, global audience, not one that is dependent on subscriptions for access, resulting in greater visibility and ultimately greater impact of your work. There have been multiple studies correlating the number of times an article is accessed with the number of citations those articles receive (Brody et al., 2006; Eysenbach, 2006a). OA articles

are accessed more frequently than comparable non-OA articles, suggesting that they will be cited more frequently. A recent longitudinal bibliometric analysis of OA vs. non-OA papers published over a six-month period in *PNAS (Proceedings of the National Academy of Sciences)* supports this premise (Eysenbach, 2006a). Multivariate analysis was used to disentangle potentially confounding factors including subject area and citation history of lead authors, thereby overcoming uncertainties in early analyses (Harnad and Brody, 2004; Kurtz, 2004; Antelman, 2004; Wren, 2005) that also concluded higher impact of OA. Even in a journal widely available in research libraries, and one that publicly releases its full content after six months, OA articles were found to be twice as likely to be cited in the first four to 10 months compared to non-OA articles. A recent update to this study found that OA articles continued to be cited more frequently 17 to 20 months after publication, reaching a 47% difference in citations between OA and non-OA papers (Eysenbach, 2006b). That the rate of new citations is still greater for the OA cohort (Figure 1) is strong evidence that the

effect of OA is a true increase in citations. It is somewhat puzzling why this is so. While there is a cohort of readers that do not have subscription access and thus must wait until the journal releases content six months after publication (12 months in the case of *Plant Physiology*), I believe a stronger factor is the ease with which Open Access papers can be directly viewed from various sorts of web searches.

Plant Physiology has since December 2005 offered an author fee-based Open Access option similar to that of *PNAS*, resulting in about 10% of the articles that we are now publishing being Open Access.¹ Although it is still too early to have meaningful citation data for *Plant Physiology* OA articles, Figure 2 shows that on average OA articles in *Plant Physiology* have been accessed 31% more often than non-OA articles in the same issue, and there seems little doubt that this increase in “hits” will translate into an increase in citations.

Even with the benefit of increased impact, the cost of OA publication can be an obstacle for authors. Access to funds that can be used for publication charges including OA charges may be a reason that a lower proportion of European authors select OA: Research grants in many of these countries do not provide funds for these purposes (MacCallum and Parthasarathy, 2006). Of the top 10 plant research journals ranked by impact factor (*Journal Citation Reports*, 2005, Thompson Scientific, formerly Thompson ISI), eight are experimenting with OA options for authors (Table 1). To date, all have been based on the “author pay” model and range in price from \$400 to \$3,000 per article. With the exception of *Plant Physiology* and *The Plant Cell*, the other journals offering OA options are not solely published by a scientific society. *Molecular Plant Microbe Interactions*, the other fully society-published journal, does not currently have an OA option. Blackwell Pub-

PNAS: OA vs. non-OA Citations

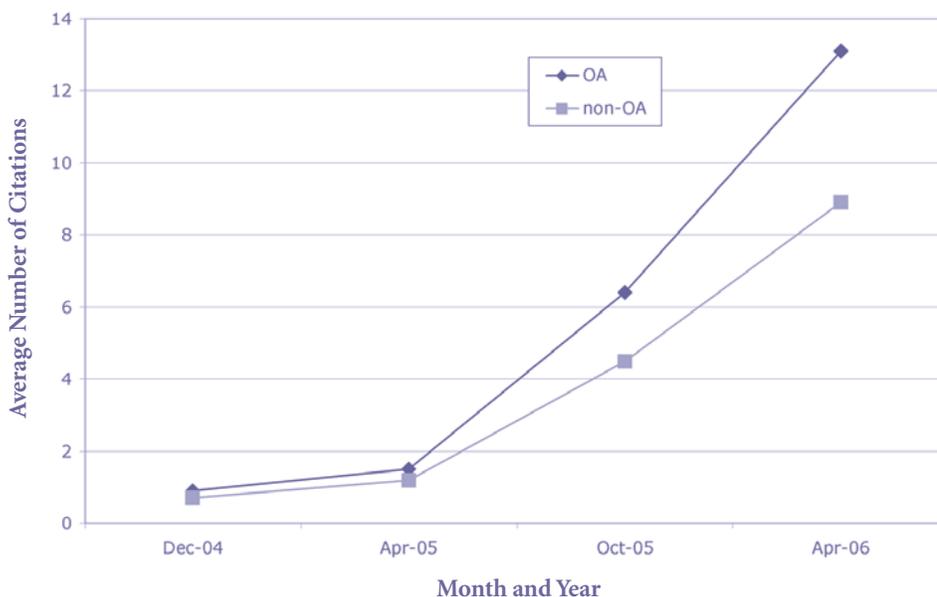


Figure 1. Comparison of mean number of citations of OA vs. non-OA research articles published in *PNAS* during June to December 2004. From Eysenbach (2006b).

¹ *The Plant Cell* also offers this option, with ~17% of authors choosing the author fee-based OA option.

Plant Phys: OA vs. non-OA Access

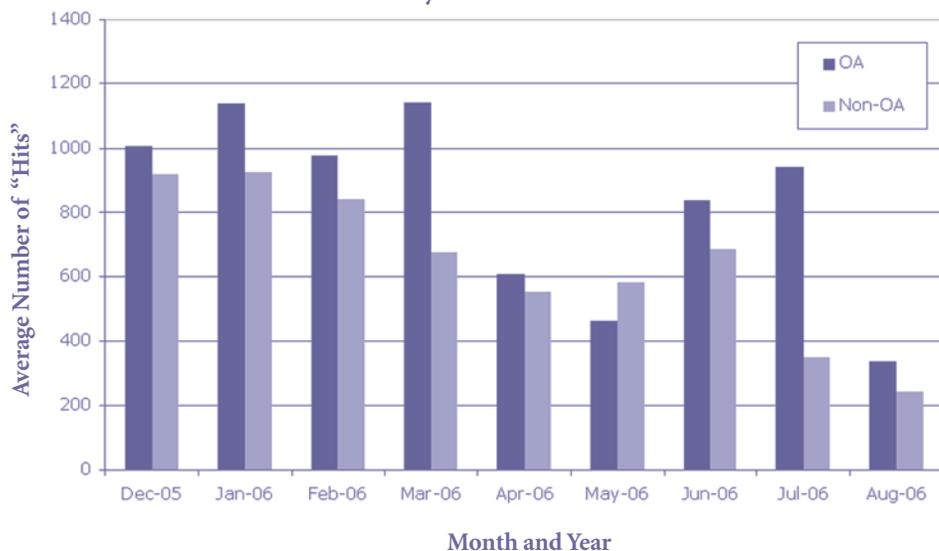


Figure 2. Cumulative full-text HTML and pdf access to OA and non-OA articles in *Plant Physiology*.

lishing and Oxford University Press offer OA for some but not all of the journals they publish. *Journal of Experimental Botany* received a substantial grant from the Joint Information Systems Committee (JISC) of the UK allowing for all papers with a UK author published in the trial to be freely available online without an author charge. The *Real-Time Plant Physiology* OA model makes OA accessible to more corresponding authors by only requiring membership in ASPB. Annual

membership in the American Society of Plant Biologists is \$115 for regular members (<http://www.aspb.org/membership/>) and considerably less for postdocs and students. If an author does not want to become an ASPB member, she/he still has the option of purchasing OA.

How does *Plant Physiology* benefit? In addition to helping attain the academic publishing aspiration of making new knowledge as widely available as possible, there is every

reason to believe that by driving higher impact and citation of the papers published in *Plant Physiology*, OA will in turn enhance the journal's impact and stature. Since more than 50% of the papers currently published in *Plant Physiology* are corresponded by ASPB members, over half the papers published in *Plant Physiology* during 2007 and beyond will be OA; I believe strongly that the journal will grow in impact and stature as a result. In line with ASPB's experience, a recent analysis by Oxford University Press on its OA experiment found that those issues of *Journal of Experimental Botany* published since the journal started offering OA were accessed more frequently, suggesting that "the presence of open access articles in a journal not only increases interest in those issues containing open access articles, but may also increase interest in other volumes" (Saxby, 2006). This observation lends further support that *Plant Physiology* will measurably benefit from this novel initiative. Because, with the exception of *The Plant Cell*, the other leading plant biology journals that offer OA are not published by a professional society, they will be unable to replicate a membership-based OA plan like *Real-Time Plant Physiology*, which I believe will translate into an improved competitive advantage for *Plant Physiology*.

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Rank	Journal	Publisher	OA policy	OA price (US\$)	2005 Total Cites	2005 Impact Factor
1	Plant Cell	ASPB	Author pay	\$1,000 (\$500 if institution subscribes)	23,294	11.088
2	Plant J	Blackwell Publishing	Author pay	\$2,500	18,089	6.969
3	Plant Physiol	ASPB	Free or Author pay	Free if corresponding author is Society member; otherwise, \$1,000 (\$500 if institution subscribes)	39,766	6.114
4	New Phytol	Blackwell Publishing	Author pay	\$2,500	11,370	4.285
5	Plant Biotechnol J	Blackwell Publishing	Author pay	\$2,500	409	4.256
6	Mol Plant Microbe In	Amer Phytopathological Soc	No OA option	—	5,532	3.928
7	Plant Cell Environ	Blackwell Publishing	Author pay	\$2,500	7,341	3.601
8	J Exp Bot	Oxford University Press	Author pay	\$400*	10,171	3.336
9	Plant Mol Biol	Springer	Author pay	\$3,000	10,981	3.328
10	Mol Plant Pathol	Blackwell Publishing	No OA option	—	761	3.327

Table 1. Comparison of OA options among the top 10 research journals in plant science.

**Journal of Experimental Botany* received a substantial grant from the Joint Information Systems Committee (JISC) of the UK; thus all papers with a UK author published in the trial will be made freely available online without an author charge. This grant was extended to include 2006.

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Real-Time Plant Physiology is the first significant OA initiative among plant journals and provides the potential opportunity for considerable “splash value.” This groundbreaking move by *Plant Physiology* promises to promote both publication in *Plant Physiology* as well as membership in ASPB.

Indeed, our unique option has already been noted in a prominent blog on Open Access (Suber, 2006).

Looking toward the future of professional society publishing. Open Access publishing addresses the Society’s mission “to promote the growth and development of plant biology, to encourage and publish research in plant biology, and to promote the interests and growth of plant scientists in general.” Since no library can subscribe to all journals, OA benefits readers by providing immediate, barrier-free access to an article they otherwise might not have. Importantly, OA also provides much greater access to the non-research community, which includes policy makers, teachers, and the media. The membership-based OA model of *Real-Time Plant Physiology* adds a tangible additional incentive to become and remain an ASPB member. It can reasonably be expected to grow membership numbers and thereby develop membership fees as a more important Society revenue source. In his blog on Open Access News, Peter Suber gave “[k]udos to *Plant Physiology* (PP) and the ASPB for this innovation” and also praised the Society’s “elegant model” (Suber, 2006). However, as pointed out by Mike Thomashow in his President’s Letter in the *ASPB News* (Thomashow, 2006), institutional subscription/site license sales to the Society’s premier journals account for almost exactly half of ASPB income. ASPB relies on this significant revenue stream not only to publish its journals but also to help fund the many important things that the Society does to benefit the plant biology community. A valid worry may be that if *Plant Physiology*’s content were to become fully OA, why should a library, with an already limited budget, maintain a subscription? The overall plan implemented to make *Real-Time Plant Physiology* feasible relies on the fact that *Plant Physiology* and *The Plant Cell* have always been marketed to institutional libraries as a bundled pair. The

cost of the *Plant Physiology/The Plant Cell* bundle to institutions is very competitively priced compared to any other single top 10 plant journal. Thus, if the content of *Plant Physiology* were to become fully OA,² the subscription bundle would provide libraries and their patrons subscription access to *The Plant Cell* at the same or lower cost of the other top journals. Clearly, *Real-Time Plant Physiology* would not have been possible without the full endorsement and support of *The Plant Cell* Editor-in-Chief Rich Jorgensen.

The leadership, editors, and staff of ASPB began in earnest a year ago to look critically at the potential impact of Open Access and Internet access to research in general on the future of publishing by professional societies and the sustainability of current publishing and society business plans. It is important, perhaps even urgent, that we continue our investigation as the implementation of OA could be externally mandated. A bipartisan-supported Open Access bill (Federal Research Public Access Act of 2006; Cornyn and Lieberman, 2006) now pending in Congress stipulates that any research funded with federal tax money³ must be made available online free of charge within six months of its publication in a scholarly journal. While it seems unlikely that reducing the subscription protection of ASPB journals from the current 12 months to six months would have any large impact (many major journals already publicly release content after six months; e.g., *Development*, *Journal of Cell Biology*, *New England Journal of Medicine*, *PNAS*; <http://highwire.stanford.edu/lists/freart.dtl>), this legislation does reveal a clear mechanism by which full OA could be legislatively mandated in this country or elsewhere. I suspect that it is the possibility of this bill leading eventually to mandated immediate public release of federally funded research that has many publishers in opposition to the bill. However, many colleges and universities support Open Access and legislation that promotes it. In fact, while we are all members of ASPB and understand the reliance of the Society on institutional subscription/site license sales, we also have firsthand knowledge at our own institutions about the consequences of rapidly escalating costs of journal acquisition on our library’s holdings and on our campus’s budget. These are

among the factors that led over 125 provosts and presidents of universities and colleges to express support for the Federal Research Public Access Act (<http://www.arl.org/sparc/advocacy/frpaa/institutions.html>).

Scholarly academic publishing is clearly in a period of transition that is being driven by Open Access and the accessibility of information via the Internet. ASPB and other professional society publishers are confronted with a different set of issues than those that confront commercial publishers. Conventional wisdom posits that OA will shift a greater proportion of publication costs to authors (i.e., funding agencies, research agencies, and academic departments) and away from library acquisition budgets. While this almost certainly would be true and is the route being taken by current fully OA journals, institutional subscription/site license sales need not disappear in an OA environment. As noted in an article by Van Orsdel and Born (2005), no decrease in subscriptions has been reported by publishers of physics journals despite the popularity of the Open Access online repository arXiv (<http://arxiv.org/>), which has been functioning since 1999. Innovative ideas are emerging to add value to our institutional subscriptions and provide incentive for libraries to remain enrolled. My personal view is that ASPB journals would fare very well in a mandated fully OA environment because with the significant cost to authors there will be an even higher premium placed on the quality and stature of journal. However, a fully OA environment would not be business as usual for ASPB or other professional society publishers. The launch of *Real-Time Plant Physiology* speaks to the Society’s willingness to embrace the change and take a leadership role. The next several years promise to be an exciting time. Stay tuned! 🌱

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² Under the *Real-Time Plant Physiology* plan, it is unlikely that *Plant Physiology* will become completely OA.

³ Technically, the bill pertains to research funded by agencies that have expenditures in excess of \$100 million; this includes USDA, EPA, DOE, NSF, and NIH, among others.

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