

# Postpublication Peer Review in Plant Science

**Jaime A Teixeira da Silva**

The literature and blogosphere are alive with activity related to fraud and misconduct in science.<sup>1</sup> One notable case in plant science is that of a South Korean plant organic chemist, Hyung-In Moon, who faked e-mail addresses so that he could review his own studies; this led to 31 (and possibly more) retracted papers (<http://retractionwatch.com/2012/08/30/20-more-retractions-for-scientist-who-made-up-email-addresses-so-he-could-review-his-own-papers/>). If one follows the increase in retractions ([www.retractionwatch.com](http://www.retractionwatch.com)) as a result of poor research conduct or lack of ethics—such as duplication, plagiarism, and data falsification—it becomes apparent that there are still relatively few retractions in plant science. That begs the question, “Is this because there is less fraud and scientific misconduct in plant science or because poor science and misconduct in this field are underreported?” Fanelli<sup>2</sup> considered the growing number of retractions to be a good sign in that it reflects an increase in academic integrity and awareness rather than an increase in academic misconduct.

Beall’s list of possible or probable predatory open-access (OA) publishers ([www.scholarlyoa.com](http://www.scholarlyoa.com)) highlights the risks caused by the explosion in OA publishing. Beall estimates that about 25% of OA journals listed on the Directory of Open Access Journals ([www.doaj.org](http://www.doaj.org)) are “predatory” and states that there has been a 20-fold spike in the number of predatory publishers or stand-alone OA journals in 3 years (<http://scholarlyoa.com/2014/01/02/list-of-predatory-publishers-2014/>). Predatory publishing spurred the development of a system to quantify predation, the Predatory Score,<sup>3</sup> but this system does not result in a tangible solution. Sting operations<sup>4</sup> may raise awareness, through anger and revolt or through deception and fake submissions, but they also cast doubt on the purpose of the entity conducting such stings and may

worsen the increasingly adverse perception of (and attack on) science (by society and skeptics).<sup>5</sup> Despite the increase in awareness, a stigma is still attached to using the word *fraud*, most likely because of the legal ramifications of its use, particularly the need to prove intent. Increasing the number of reviewers or making the peer-review process double blind still rely on a tiny, controlled sample of preselected peers, although such actions can improve the transparency of the process and reduce the level of risk.

A published paper is the culmination of a string of events that is based on the honesty and scientific integrity of four key elements that make up the publishing chain: authors, editors or editors-in-chief (EICs), peer reviewers, and publisher. A break in any of the chain’s links will weaken and corrupt the published paper. Retractions provide a window into the weaknesses of that chain. Because honesty and integrity can no longer be taken for granted in the publishing process and because it is difficult to confirm authorship, the lack of a conflict of interest (COI), or the lack of data or image fraud and manipulation even during the process of peer review, a mechanism—in addition to peer review—to detect such problems is urgently required after publication.

How does one go about correcting the literature, rectifying the errors that were introduced by editors or peers because of a lack of stringent quality-control (QC) mechanisms or slack peer review, or ensuring the removal of fraudulent papers? Postpublication peer review (PPPR) has emerged as a realistic solution. PPPR will no doubt be a voluntary service initially as awareness among conscientious plant scientists increases. However, it could become an integral part of the publishing process with greater acceptance by EICs. Ideally, in the new model, publishers would allow reports of PPPR to appear alongside published papers after scrutiny and editing. That would allow continuing debate and discussion among academics about the quality of a paper even years or decades after it has been published. Poor peer review, poor editorial oversight, and lack of scientific rigor

reflect to some extent a lack of QC and of oversight by EICs, editors, peer reviewers, and publishers. There may be little or no appetite in those four parties for embracing PPPR, inasmuch as it would constitute recognition of personal or professional weaknesses, breaks in the QC chain leading up to the publication of a paper. How can PPPR be effectively conducted if such elements resist factual claims and analyses made in PPPR reports? One possible way is through anonymity, although a stigma is still associated with anonymity, as revealed by Yong and colleagues<sup>6</sup> and even by Elsevier’s vice president, Tom Reller (<http://www.elsevier.com/connect/its-not-that-clare-francis-is-a-pseudonym-its-that-the-pseudonym-is-clare-francis>), who originally classified revelations by an anonymous whistle-blower (Clare Francis) as “unsettling” and “disruptive”. Anonymous reports are more likely to be ignored or not taken seriously than those made by named scientists.

The issue of anonymity aside, PPPR is an important way to find errors, detect scientific fraud, and examine other concerns that undermine the integrity of plant-science publishing and thus the validity of published data. A PPPR report allows an open-ended discussion among peers and thereby seeks to perfect scientific concepts that may have been unclear at the time of publication. A PPPR report would probably result in the publication of a correction. When a PPPR report is filed with a journal, the editor and publisher are responsible for examining the claim, making an independent investigation, and reporting to the person who prepared the PPPR report. For the process to be transparent, an expression of concern or in an extreme case a retraction should indicate the scientific reasons for the action taken by the publisher and, when the action is approved, also require the name of the person who issued the PPPR report and the EIC or editors who oversaw the PPPR claim. That allows identification of possible COIs of third parties. Even though a retraction that originated

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JAIME A TEIXEIRA DA SILVA is a retired scientist in Takamatsu, Japan.

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biologicals and approved trials for devices (including medical supplies).

The Sunshine Act and accompanying regulations largely, *but not entirely*, preempt state and local laws and regula-

tions. Thus, manufacturers and recipients must determine whether any additional laws or regulations are relevant to specific situations. For most journals, authors must disclose conflicts of interest and funding

support. The Sunshine Act provides yet another mechanism for transparency in those relationships and adds the force of law behind the failure to make such a disclosure. 

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in a PPPR report may serve as a form of public shame among peers, it also serves the important function of a deterrent for scientists who wish to commit scientific fraud or for those who accidentally and carelessly undermine the importance of QC before submission of a manuscript to a journal. With PPPR, a decision made by an EIC or editors—usually on the basis of peer reviewers' reports—does not determine the final status of a published paper. PPPR would also help to eliminate actual or perceived bias inherent in the traditional peer-review process<sup>7</sup>. Finally, a PPPR report would lead to a public historical record of scientific misconduct or fraud or lack of QC and should thus not be subject to copyright.

When a PPPR report is received by an EIC or publisher who flatly refuses to examine it—because it is outdated, because it may overburden the review system, or because of professional pride or arrogance—how can it be made public to raise awareness? Revealing a scientist's identity in a PPPR may expose the scientist to professional abuse or bias, reveal COIs, and damage his or her reputation, even though, as Yong and colleagues<sup>6</sup> indicate, “a person has the obligation to do the right thing if they can.” The adverse and unintended consequences of an EIC's or publisher's failure to act on a PPPR report that factually lists errors, fraud, or misconduct are that such a paper will continue to be referenced in the literature; that is, continued recognition will be given when it should no longer be. In such a case, who should be held accountable for intransigence and professional negligence?

PPPR is an important way—whether used anonymously or not—to raise awareness about and correct errors in the plant-science literature<sup>8</sup>. Even if somewhat controversial, PPPR is an effective tool.

Although still in a nascent stage, open-commentary tools used by such publishers as *Frontiers* ([www.frontiers.org](http://www.frontiers.org)), open peer-review systems used by such journals as *F1000 Research* (<http://f1000research.com>), and such tools as *PubPeer* (<https://pubpeer.com/>) and *PubMed Commons* ([www.ncbi.nlm.nih.gov/pubmedcommons/](http://www.ncbi.nlm.nih.gov/pubmedcommons/)) are all evidence that PPPR is becoming established as a way to correct the scientific literature and expose scientific misconduct and fraud.

### Summary

Errors in the plant-science literature can have fundamental adverse consequences for science and society. Incorrect findings and fraudulent data in scientific reports of research that cannot be reproduced may corrupt the literature, burden taxpayers, and diminish public trust in science. Inefficient, incomplete, and biased peer review aids that erosion, as does—to some extent—the rapidly evolving open-access movement. However, open access also provides a way to detect poor science, misconduct, and fraud. A spike in retractions in the biomedical sciences may reflect a rise in awareness of and action to correct research and publishing misconduct and improved methods for detecting such misconduct. An effective way to fortify the validity of data and to sustain trust among science peers and the public is required. Postpublication peer review (PPPR) is one concrete solution. PPPR complements traditional peer review and allows trust in the peer community to be regained. However, it will take an active effort by scientists, editors, peer reviewers, and publishers—the cornerstones of the publishing process, each with their own responsibilities, pre- and postpublication<sup>9</sup>—to improve and

correct the plant-science literature. PPPR will undoubtedly be embraced by some and skeptically shunned by others.

### Conflict of Interest Statement

The author declares that the research for this paper was conducted in the absence of any commercial, financial, or other relationships that could be construed as a potential conflict of interest. 

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