Mistaking the symptom for the disease: preprints in biomedical science

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Back in February, much significance was attributed to the fact that some biologists, including Nobel laureate Carol Greider, were posting their research articles directly on the web. Amy Harmon wrote about it for the New York Times and others looked for reasons why a culture of preprints—research published online before being submitted for peer-review—developed in physics, but not biology (Harmon 2016; Nowogrodzki 2016).

Notably missing from this coverage, however, was a critical look at the preprint movement itself and the roots of the problem it aims to fix. Academic biomedical science today is plagued with hard issues. There's the rich-get-richer phenomenon, where 50% of NIH grants go to a small number of already well-funded labs (Slavov 2014). The competition for funding and a dearth of academic positions drive what Marc Kirschner called a "perverted view of impact": an obsessive desire to measure and rank scientific progress, which is often reduced to number of publications in high-profile journals or perception of clinical relevance (Kirschner 2013). The system also suffers from rampant sexism, conscious and unconscious, that repels women away from science (Jahren 2016; Moss-Racusin et al. 2012; Ghorayshi 2016). There is also the corrupting influence of money on science, including hawkish patenting practices that conflict with the university's basic tenets (Katz 2015). Working within this system can be an exercise in dissonance: the incentives for success are at odds with promoting open, diverse and adventurous basic science.

ASAPbio, as the biology preprint initiative has come to be known, chose to focus on a narrow manifestation of this unhealthy system: a lack of preprints in biomedical science. The initiative mistakes the symptom for the disease, by gearing its efforts towards publishers and the scientific establishment, who profit from the status quo and are unlikely partners in driving the necessary change in culture.

Traditional science publishers are for-profit businesses built on an exploitative model. Labor is provided for free by publicly funded academics, only to then have the products be sold to the public again. Yet Emillie Marcus, the editor of Cell—a journal that went from prohibiting preprints to subtly discouraging them—was invited as a speaker to ASAPbio. It was expected that scientists could reach a compromise with the journals. But the journals' profitability is undeniably threatened by the open culture that would benefit scientists and the public. It isn't the academic community's job to rescue a billion-dollar company like Elsevier (publisher of Cell), a notable hoarder of humanity's knowledge.

Perhaps more importantly, ASAPbio looks to the scientific establishment for leadership. The voices and concerns of Nobel laureates, HHMI investigators and former NIH directors dominated the meeting. Not surprisingly, the meeting fixated on the question of whether preprints determine priority of

discovery. This only fuels the toxic preoccupation with priority and importance in biomedical science, which Kirschner reminds us "can only be viewed in the rearview mirror." Moreover, priority and importance can't be judged in a closed meeting.

Even if elite scientists post preprints, they can make an obvious cynical use of them. With reputations built largely by publishing in "glamour" journals, these scientists know that their work will be read. For them, preprints can simply cut the tedium of dealing with editors and peer-review demands. The promise that preprints guarantee priority is icing on the cake. Faculty who want to continue to play the glamour publishing game can even submit these same articles to closed-access journals, defeating the purpose of open science. Indeed, some of the advocates of ASAPbio publish in closed-access journals. An early draft of an article may be available on the bioRxiv, only to later appear behind the paywall of Nature. Is this the big gain worth fighting for?

The "ASAP" in ASAPbio is a red herring. Expedience isn't the fundamental issue, but rather changing the culture of a perverted system. When it comes to publishing, the decision not to hand control over publicly funded work to journals is an ethical one—not just a matter of convenience. In fact, as Vitek Tracz pointed out, for traditional publishers "open-access" can become yet another source of revenue. Journals may charge authors more to make an individual article open, while continuing to publish closed-access articles. ASAPbio doesn't promote the principled stand for real open-access (and against parasitic publishers) that might change these practices.

The academic community can take action to genuinely promote an open science culture. One approach is divestment, familiar from other struggles for the common good. Universities could simply cancel their subscriptions to closed-access journals. This is already happening, though not necessarily out of support for open science. The University of Montreal recently canceled its subscription to most Springer journals, mainly because it could no longer afford it (Dumont 2016). Universities divesting from the journal system in this way would effectively cut the lifeline to exploitative publishers.

Boycotting of publishers is another strategy. Elsevier has been boycotted as part ofThe Cost of Knowledge campaign that was started by computer scientists and mathematicians. The biomedical community could follow a similar course, and promote a petition calling on scientists to refuse to publish in or review for closed-access journals. There's an obvious issue with such a petition: students and postdocs wouldn't be able to sign it, for the most part. This reflects one of the underlying structural problems. The strongly hierarchical nature of the biomedical academic lab, imposed in part by the way funding is distributed, means that students and postdocs have little control over how their work is published. This is a reminder that it's not enough to strive to democratize access to content—more equal control over the knowledge production process is also necessary.

There are other forms of resistance to exploitative publishing which are taking place outside the university. Alexandra Elbakyan started Sci-Hub, a website that serves digital copies of millions of articles that are behind journal paywalls. But Elsevier recently filed a lawsuit against the site, claiming millions in damages, which led to Sci-Hub's main domain getting shut down. Nevertheless, Sci-Hub revealed the huge scope of published work that has been locked away and people's desire to access it.

Academics, who are both the major consumers and producers of journal content, have enormous power to renegotiate the terms of publishing. This will require us to look beyond expedience and confront the politics of publishing as a matter of public interest. That a Nobel laureate agreed to post a preprint is of little significance. The hard work ahead will be to create a movement of scientists who value open science culture at their earliest stages in research, and to restructure incentives so that these scientists have a path for survival.

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