What Is Really Driving the Preprint Trend? 4 Key Factors in Its Success

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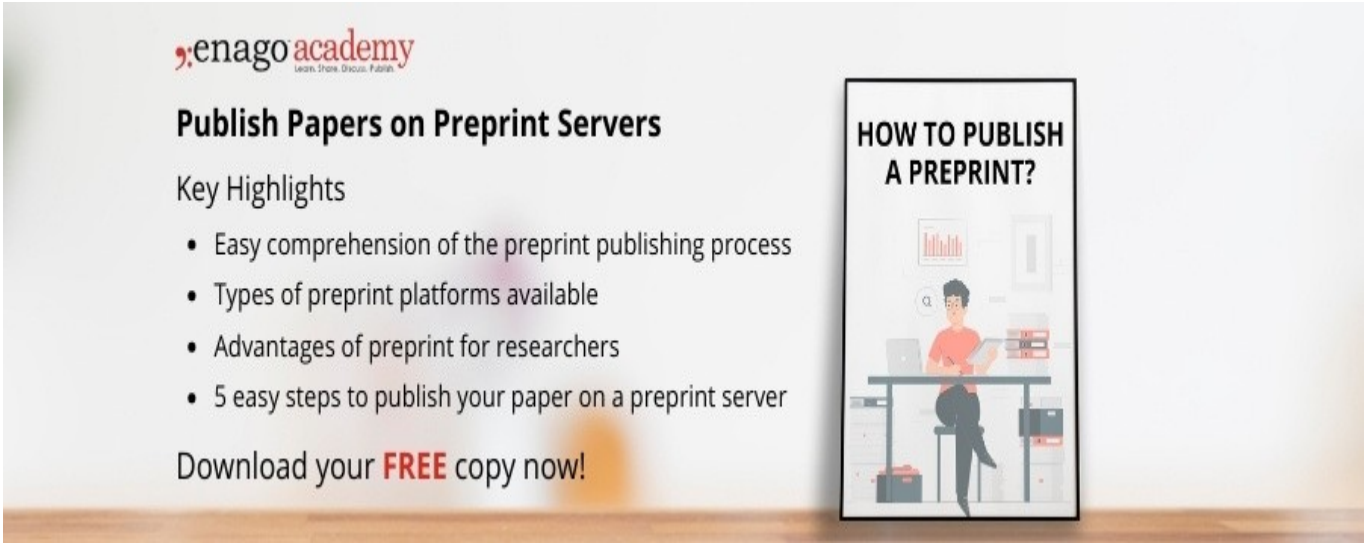
Academic publishing has long relied upon a simple approach. Write the manuscript, ask a few colleagues for comments on it, and then submit it to a journal for peer review. Hopefully, the manuscript is accepted for publication, usually after one or more revisions. This entire process often takes at least several months. However, adherence to this publication model is changing fast in biology.

Is Preprints a Real Trend?

A recent study by J. Polka highlights the increasing use of preprints in the academic publishing of biological research. A preprint is a non-peer-reviewed, yet complete draft of a manuscript that is available online, typically in a repository. As such, it is quickly and publicly available for others to see and read before undergoing formal peer review and acceptance at a target journal. Indeed, authors in physics and mathematics have been “preprinting” for 25 years now using the ArXiv repository.



The main study result is quite astounding. While preprinting was mostly flat at 100 manuscripts per month for 9.5 years, from January 2003 through July 2012, since then it has taken off, reaching 900 manuscripts per month by July 2016. Importantly, this rapid rise occurred in tandem with the expansion of preprint services, namely BioRxiv, PeerJ Preprints, and F1000Research. Although ArXiv has long had a “quantitative biology” section, it did not drive the exponential rise in preprints.

Is this upswing in preprinting a fad? Or is it a real shift, a promising trend in how biologists communicate their academic research? It is a fair question; 900 preprints per month is a drop in the bucket, being just 1% of PubMed articles published over the same study period.

Key Factors Affecting Preprint Success

The study shows how any long-term success of preprinting in biology will rest on four crucial factors.

1. The first factor deals with culture. People are reluctant to change their ways unless they see peers and mentors do it too. The study author (Polka) and her colleagues were impressed by the positive responses received at a 2016 conference of stakeholders in biology academic publishing, aptly named ASAPbio. They now actively promote preprinting in life sciences by bringing together scientists, funders, and publishers, alongside tech experts and societies, for information exchange and dialogue.
2. The second factor concerns the preprint policies. This is a fast-moving era and funders seem most enthusiastic about using preprints. Arguably, from their perspective it is sensible: research quickly comes to light, is no longer hidden or mired in peer review, allowing for “real-time”, up-to-date evaluation of an applicant’s research productivity. Some funders (e.g., *Welcome Trust*) now allow authors to cite their own archived preprints. Universities are also gradually noticing the value of preprints for academic promotion and advancement.

3. Similarly, another factor is the playing field and infrastructure for preprinting. Specifically, nothing prevents scholarly societies, and even journals (e.g. PloS), or any other organization from starting their own preprint service. Is more better in this respect? ASAPbio is setting up a centralized open access archive for biology, with the support of major funders, to coordinate efforts on this front.
4. The fourth factor makes for an interesting thought experiment. Will the relevance of scholarly journals diminish with the rapid rise in biology preprinting? It seems unlikely, judging by the persistence in journal publishing of older ArXiv preprints, since journals still do the essential tasks of organizing peer review, alongside evaluating and curating academic research. More importantly, journals are complementary actors on the preprint landscape, who may even seek out worthwhile preprints for soliciting submission invitations (e.g., *PLoS Genetics*).

Preprint Services: Pros and Cons

With the internet increasing accessibility and affordability, preprinting is fast, cheap, and easy. Another advantage with preprints is enhanced visibility and showing experiments that have been completed on time—perhaps most benefitting early-career biologists—and of setting precedence for novel findings or even a major discovery. For example, BioRxiv has no fees, and your work reaches its audience much faster than any traditional journal, and leaves the door open to commenting and informal peer review of your preprint, from the entire research community, which could improve the manuscript's quality before submission to a journal.

However, trade-offs are unavoidable with preprint services. The biggest one is that, unlike traditional publishing, most preprint services lack a structured process of peer review. Some eschew it altogether, arguing that science can progress better with preprints, since it then falls to readers to make the final judgment on the originality and value of the academic research. A major risk is being uncertain about how your preprint is received and viewed by others, who may not take it seriously or respect you for it. In addition, some journals may not accept a submission if it is a preprint already, but this is changing. As preprint services expand, how to judge and select among them adds another layer of uncertainty, as does the current dire funding climate and the hyper-competition in academic research it fosters.

Impact of Preprints

It is too early to say. Clearly, biologists have shed their reluctance to "preprint", especially since they are less restricted in also trying to publish in a journal. Life scientists increasingly appreciate the value and openness it offers, which ultimately lets readers judge the final value of the work and the speed to share research given the troubled state of peer review system. How far this trend goes and endures, will surely depend heavily on how it affects researchers' careers. Notwithstanding a few concerns, the case for preprinting in biology has a lot going for it.

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