

NEWS

Finally, biologists get serious about preprints

BY JESSICA WRIGHT

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The ExAC browser is a hot new resource. It **allows geneticists to look for variants** in the genomes of more than 60,000 people. Yet it has never been published in a peer-reviewed journal.

ExAC's creators first presented the database at a genetics meeting two years ago. Excited by its potential, researchers started using it — so much that at the same genetics meeting the following year, dozens of posters included it. But without access to the manuscript, researchers had not yet had a chance to evaluate the tool's statistical foundation.

The paper is still meandering through peer review at a high-profile journal, but the team **posted a draft online** last year, on a site called **bioRxiv**. "We need to make sure that as geneticists, we

communicate our data as rapidly and accurately as possible,” says **Mark Daly**, a geneticist who studies autism and is a member of the database team. He and his colleagues **pledged** to do the same for all their publications.

Daly and his colleagues are part of a movement that is gaining traction. Over the past year, a group called **ASAPbio** has been leading the charge to use preprint servers to disseminate biology research results¹. The group has met twice this year with journal editors, researchers and funding groups to advance its cause.

On Monday, officials from the National Institutes of Health (NIH) and 15 other funding organizations committed to establishing a unified policy on taking preprints into account for grant applications. “The idea here is that we would try to be homogenous across funding agencies — which, believe me, doesn’t happen much — about our view of preprints,” says **Philip Bourne**, associate director for data science at the NIH.

In February, journal editors drafted a statement encouraging researchers to **post their studies to a preprint server** before submitting them for publication. ASAPbio aims to convince all journals to adopt this policy, says **Jessica Polka**, a postdoctoral fellow at Harvard University and an ASAPbio co-organizer.

Catching up:

Physicists and mathematicians have been posting preprints, mostly on a server called **arXiv**, for 25 years. These preprints allow scientists to share their work instantaneously — before any formal peer review — and receive feedback on early drafts. Papers are freely available to anyone.

But biologists have generally been wary. Traditional peer review lasts months or even years, as researchers respond to reviewers’ requests for more information or experiments. Yet biologists worry that their rivals might scoop their findings if they release them on preprint servers and that journals will refuse to publish them — and so doom young researchers’ chances of promotion, which depend on publication records.

But as researchers test preprints, these worries may fall away. Instead of making it easier for researchers to scoop each other, a preprint publication records who had the idea first, says **Michael Lombardo**, a senior researcher in psychiatry at the University of Cambridge in the United Kingdom.

“When you put the preprint out there, you are staking your claim to whatever findings you had,” Lombardo says. He has published two autism studies on bioRxiv, both of which are under review at journals.

The fact that many journals have agreed to accept manuscripts posted on preprint servers should

also reassure researchers, says **Dan Arking**, associate professor of genetic medicine at Johns Hopkins University in Baltimore, Maryland. Arking posted a paper on bioRxiv last October; the revised manuscript was **published in May** in *Translational Psychiatry*.

“When you see high-profile groups posting and you see those papers coming out in top-tier journals, you don’t worry about getting shortchanged,” he says.

Far from hurting junior researchers’ careers, preprint servers might help them get jobs, Daly says. Hiring committees often cannot see manuscripts under peer review. “It was mysterious and invisible to you,” Daly says. “Now I can look at a preprint and more fully evaluate the academic output of this individual.”

Sensitive science:

Still, even the most ardent advocates of preprints acknowledge the difficulty of establishing an official preprint site for biology. One concern is that science is global, so preprint servers should not be run by entities associated only with the United States, says Polka. There should also be measures in place to prevent servers from later being sold to a private organization.

Some also argue that papers on medical findings may be dangerous if released to the public without careful scrutiny. “In cases where the research has potential direct impact on human lives, it is especially important that the scientific community and publishers provide society with appropriately vetted and reliable findings,” **Emilie Marcus**, chief executive officer of Cell Press, said in a response emailed through the press office. Cell Press, which publishes several high-profile journals including *Cell* and *Neuron*, will consider publishing preprints on **a case-by-case basis**, Marcus says.

Unlike traditional peer review by three experts, preprints open papers up to public comment, allowing researchers to immediately post caveats and concerns. A poor article would generate negative commentary that would warn readers.

Researchers, too, benefit from these comments. The EXaC browser manuscript generated several comments on bioRxiv, ranging from corrections for typos to questions on how the researchers associated variants with a disease. The researchers revised their manuscript to address some of these concerns.

“There’s no reason why other scientists can’t be looking at your data and making their own decision about it and integrating it with their own studies,” Daly says. “If we self-impose a lot of delays in this, then we self-impose the fact that we’re not going to be helping people as soon as we ought to be.”

REFERENCES:

1. Berg J.M. *et al. Science* **352**, 899-901 (2016) [PubMed](#)