Promoting a culture of preprinting in biology

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Two views on publishing research articles

Either way, speed is paramount
Publishing in biology is slow

Publication is tied to evaluation

Ron Vale – bioRxiv & PNAS 2015
Preprints accelerate research sharing

Preprint server

Public

Private

Journal 1

Journal 2

Journal 3

Peer-reviewed journal article

Time

1 day
1 month
2 months
3 months
Months to years
Benefits of preprints

• Accelerate discovery
• Find collaborators
• Gain visibility
• Create a record of what work was done, on what date
• Demonstrate productivity (jobs, grants)
This is old news

Also SSRN, RePEc, etc
Can preprints play a larger role in biology?

Mid 2015: about 400 life sciences preprints posted per month
Meeting report

POLICY FORUM | SCIENTIFIC COMMUNITY

Preprints for the life sciences

Jeremy M. Berg¹, Needhi Bhalla², Philip E. Bourne³, Martin Chalfie⁴, David G. Drubin⁵, James S. Fraser⁶, Carol W. Greider⁷, Michael Hendricks⁸, Chonnettia Jones⁹, Robert Kiley⁹, Susan King¹⁰, Marc W. Kirschner¹¹, Harlan M. Krumholz¹², Ruth Lehmann¹³, Maria Leptin¹⁴, Bernd Pulverer¹⁴, Brooke Rosenzweig¹⁵, John E. Spiro¹⁶, Michael Stebbins¹⁷, Carly Strasser¹⁸, Sowmya Swaminathan¹⁹, Paul Turner²⁰, Ronald D. Vale²¹, K. VijayRaghavan²², Cynthia Wolberger²³

http://science.sciencemag.org/content/352/6288/899.full
ASAPbio moving forward

• Convening meetings & encouraging discussion
• Providing introductory information on preprints
• Tracking funder, university, & journal policies
• Studying stakeholder attitudes & preferences
• Working with funders to propose infrastructure development
Preprints in the life sciences are booming

Preprints per Month

- arXiv q-bio
- Nature Precedings
- F1000Research
- PeerJ Preprints
- bioRxiv
- The Winnower
- preprints.org
- Wellcome Open Research

Courtesy Jordan Anaya, prepubmed.org
Biology preprints in perspective

PubMed: ~100,000 articles per month

All life sciences preprint servers: ~1,000 per month
In some physics fields, >70% of manuscripts are preprinted

What’s different?

Larivière et al 2013 (arXiv)
Physics vs. biology

• Competition

• Difficulty of reproduction
  Math vs. HEP vs. Cond-mat

• Historic precedent

• Culture

Funding rates

<table>
<thead>
<tr>
<th>NSF 2016 Astronomy</th>
<th>NSF 2016 Physics</th>
<th>NIH 2014 RPG</th>
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<tr>
<td>22%*</td>
<td>33%*</td>
<td>18.1% **</td>
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NIH Information Exchange Groups (1960s)

Preprints made Outlaws

The Commission of Biochemical Editors of the International Union of Biochemistry is proposing to take firm and, it hopes, lethal steps against the Information Exchange Groups which have been organized, over the past four years, from the National Institutes of Health in the United States. At a meeting in Vienna a week earlier of 15 editors, it was decided to take legal action, and a letter to this effect has been circulated to all editors.

More at:
Predecessors of preprint servers
Learned Publishing 2001; 14(1): 7-13

James E. Till, The University of Toronto

* https://www.nsf.gov/funding/funding-rates.jsp?org=MPS
** https://nexus.od.nih.gov/all/2015/06/29/what-are-the-chances-of-getting-funded/
How can we promote culture change?
The cycle of cultural change

- Attitudes
- Values
- Beliefs

The cycle of cultural change

The cycle of cultural change

- Enable
  - Information/awareness
  - Capacity/Infrastructure
- Encourage
  - Incentives
  - Requirements
  - Recognition
- Engage
  - Co-production
  - Fora
  - Networks
- Exemplify
  - Consistency
  - Leading by example

Funders are major leaders in biology preprint adoption
Funder policies

We accept preprints in grant applications: new guidance for researchers

Category: Research

12 Jun 2017

Use of preprints in BBSRC-funded research

In line with the announcement by MRC (see [MRC: The MRC supports preprints](#)), BBSRC wishes to remind researchers that preprints are acceptable for citation in research grant and fellowship applications.
“In the interests of accelerating scientific discovery, the Biohub will establish a publication policy for open and rapid dissemination of research results: all Investigators will be required to post manuscripts on Arxiv on the date of submission to peer-reviewed journals.”

https://med.stanford.edu/rmg/funding/chan_zuckerberg.html
BioRxiv preprint server gets funding from Chan Zuckerberg Initiative

By Jocelyn Kaiser | Apr. 26, 2017, 3:00 PM

Big biology projects warm up to preprints

Consortium backed by US National Institutes of Health is first major biology programme to mandate online publication of results ahead of peer review.

Elie Dolgin

30 November 2016

Biologists have been slow to embrace preprints, but for some it’s no longer a choice.

The 4D Nucleome, a major research consortium funded by the US National Institutes of Health (NIH), is now requiring that all manuscripts related to its US$120-million, five-year programme are posted to an online preprint server ahead of peer review. And a privately funded, US$600-million biomedical research initiative in California is considering whether to demand its investigators do the same.
March 24, 2017: NIH encourages preprints

NIH’s new embrace of preprints will be a boon to science

Reporting Preprints and Other Interim Research Products

Notice Number: NOT-OD-17-050

Key Dates

Release Date: March 24, 2017
Effective date for application: Applications submitted for the May 25, 2017 due date and thereafter
Effective date Research Performance Progress Report (RPPR): RPPRs submitted on or after May 25, 2017

Related Announcements
NOT-OD-17-006: Request for Information (RFI): Including Preprints and Interim Research Products in NIH Applications and Reports

Issued by
National Institutes of Health (NIH)

Purpose

The NIH encourages investigators to use interim research products, such as preprints, to speed the dissemination and enhance the rigor of their work. This notice clarifies reporting instructions to allow investigators to cite their interim research products and claim them as products of NIH funding.
Cultural change is slower

7 concerns about preprints
Concern 1: We can’t be trusted to share our work before peer review

- Reputation is important
Concern 2: I’m going to get scooped

*ie: preprints are public but not obviously well-respected*

Paul Ginsparg, founder of arXiv on scooping:

“It can’t happen, since arXiv postings are accepted as date-stamped priority claims.”

asapbio.org/preprint-info/preprint-faq

39 responses (EMBO Postdoc Fellows meeting, 2016)
Concern 3: Journals won’t accept my preprint


Contains links to original policies
Annotations are inserted here to assist in identifying changes made in December 2016

Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals

Updated December 2016

I. About the Recommendations
   A. Purpose of the Recommendations
   B. Who Should Use the Recommendations?
   C. History of the Recommendations

II. Roles and Responsibilities of Authors, Contributors, Reviewers, Editors, Publishers, and Owners
   A. Defining the Role of Authors and Contributors
      1. Why Authorship Matters
      2. Who Is an Author?
      3. Non-Author Contributors
   B. Author Responsibilities—Conflicts of Interest
      1. Participants
         a. Authors
         b. Peer Reviewers
         c. Editors and Journal Staff

This recommendation does not prevent a journal from considering a complete report that follows publication of a preliminary report, such as a letter to the editor or an abstract or poster displayed at a scientific meeting. It also does not prevent journals from considering a paper that has been presented at a scientific meeting but was not published in full, or that is being considered for publication in proceedings or similar format. Press reports of scheduled meetings are not usually regarded as breaches of this rule, but they may be if additional data tables or figures enrich such reports. Authors should also consider how dissemination of their findings outside of scientific presentations at meetings may diminish the priority journal editors assign to their work.
Preprints complementing & strengthening journals

• Potential for more peer opinions and early error correction

“In addition, the journal reserves the right—but is not obligated—to consider the comments made to manuscripts posted to preprint servers and factor these comments into final decisions at any stage of the peer review process.”
A new kind of marketplace for papers

Editorial Board

Over 140 members of the genetics community submit manuscripts meet the journal's standards.

The editorial process is run as a partnership of experts who act as Associate Editors.
“In our view, it is better to share science in two forms: carefully peer reviewed and not peer reviewed than the “modest peer review and quality control” that many journals can muster now in the face of pressure to publish more at lower costs.”

“Journals don’t have to perform every publishing trick anymore. Maybe it’s time to return to doing what they do best — vetting information carefully, validating claims as best they can, and ensuring novelty, quality, relevance, and importance around what they choose to publish.”
Concern 4: How should preprints be covered in the media?

Cell phones & cancer

Vaccines & autism
Concern 5: How can we ensure ethical disclosure of data?

Screening standards/expectations are needed.
Concern 6: How should preprints be licensed?

bioRxiv licenses over time

- No licence: 29%
- CC-BY: 19%
- CC-BY-NC: 9%
- CC-BY-ND: 7%
- CC-BY-NC-ND: 36%

“Creative Commons licenses are not compatible with the [PNAS] License to Publish. Authors are requested to select the “no reuse” distribution/reuse option.”

Daniel Himmelstein

“NIH strongly encourages awardees to select a Creative Commons Attribution (CC-BY) license or dedicate their work to the public domain.”

We have established a task force on licensing

ASAPbio.org/licensing

Biologists debate how to license preprints

Flood of online manuscripts generates confusion about terms for distribution and reuse.

Lindsay McKenzie
16 June 2017
Concern 7: what is a preprint, & how to find it?

Different policies & resources for archiving, screening, access

Courtesy Jordan Anaya, prepubmed.org
Funder principles for supporting infrastructure

1. Independent governance
2. Community support
3. Open content and scholarly standards
4. Build on existing infrastructure, services, and good practice
5. New code open & interoperable
6. Access must be free
7. Easy to use
8. Sustainability model

http://asapbio.org/principles
Major discussions

• How to promote an ecosystem that works in the best interest of research?
• How should best practices & standards be set?
• How should machine access be supported?
• What infrastructure or services are needed?

Meeting on July 19 to discuss these questions
jessica.polka@asapbio.org
Thank you!

- ASAPbio board
  - Ron Vale (Founder/President)
  - Cynthia Wolberger
  - Jaime Fraser
  - Harold Varmus
  - Daniel Colon-Ramos
  - Tony Hyman
  - Harlan Krumholz
  - Dick Wilder (non-voting)