

# Promoting a culture of preprinting in biology

Jessica Polka

Director, ASAPbio

Visiting Scholar, Whitehead Institute

@jessicapolka | @ASAPbio\_ | #ASAPbio

# Two views on publishing research articles



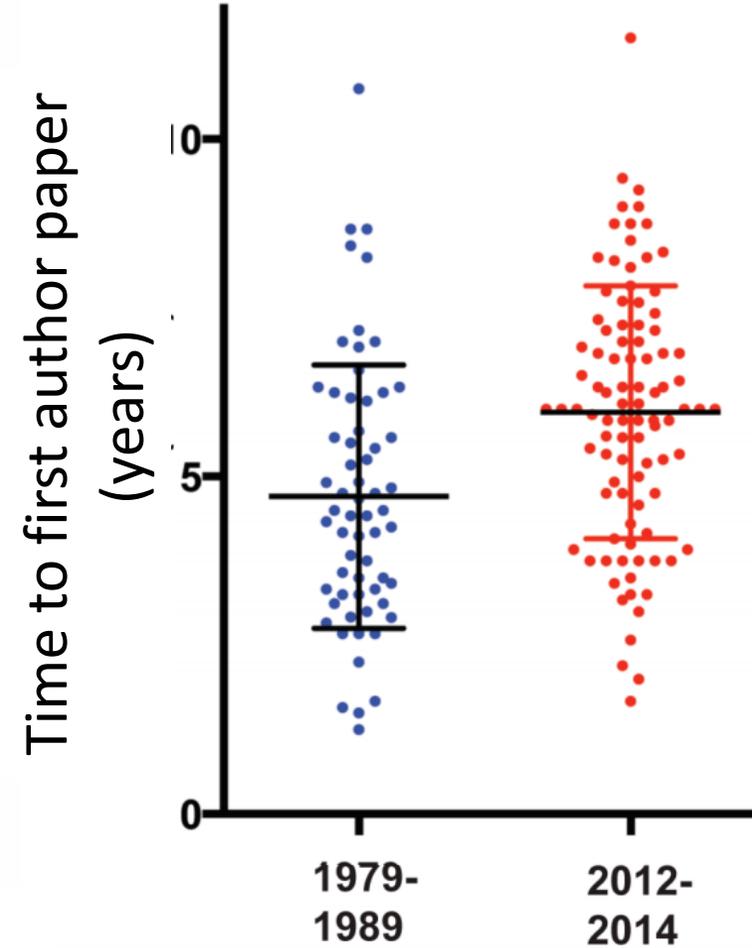
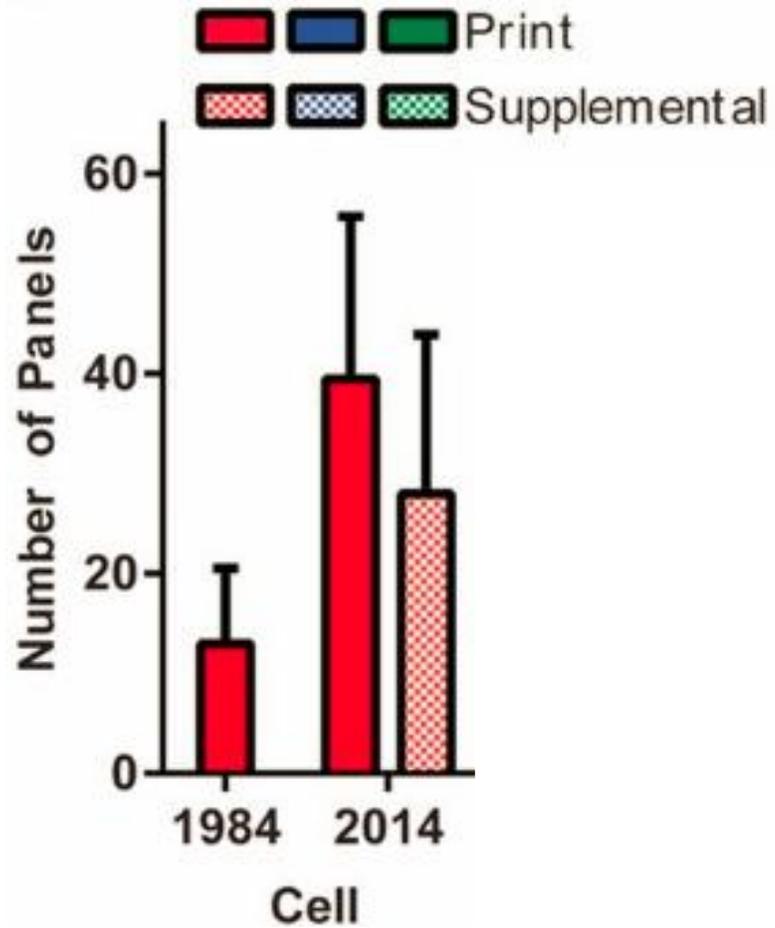
Photo by [George Makris](#)



Photo by [calafellvalo](#)

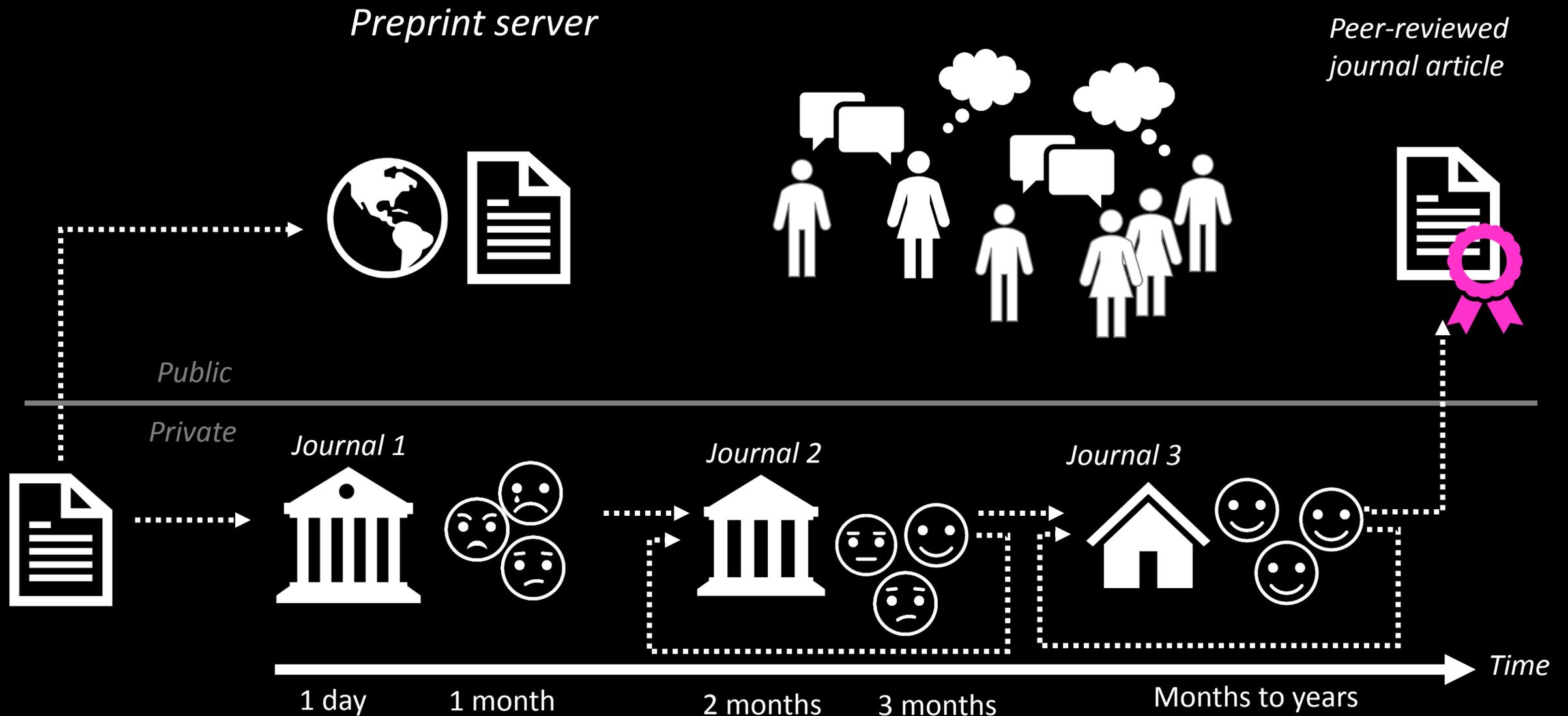
**Either way, speed is paramount**

# Publishing in biology is slow



Publication is tied to evaluation

# Preprints accelerate research sharing



# 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



Cornell University  
Library

arXiv.org

Open access to 1,275,427 e-prints in Physics, Mathematics, Computer Science, Quantitative

Subject search and browse:

Also SSRN, RePEc, etc

Mid 2015: about 400 life sciences preprints posted per month

Can preprints play a larger role in biology?

February 2016, HHMI Headquarters



<http://asapbio.org/meeting-information>

# Meeting report

**POLICY FORUM** | SCIENTIFIC COMMUNITY

## Preprints for the life sciences

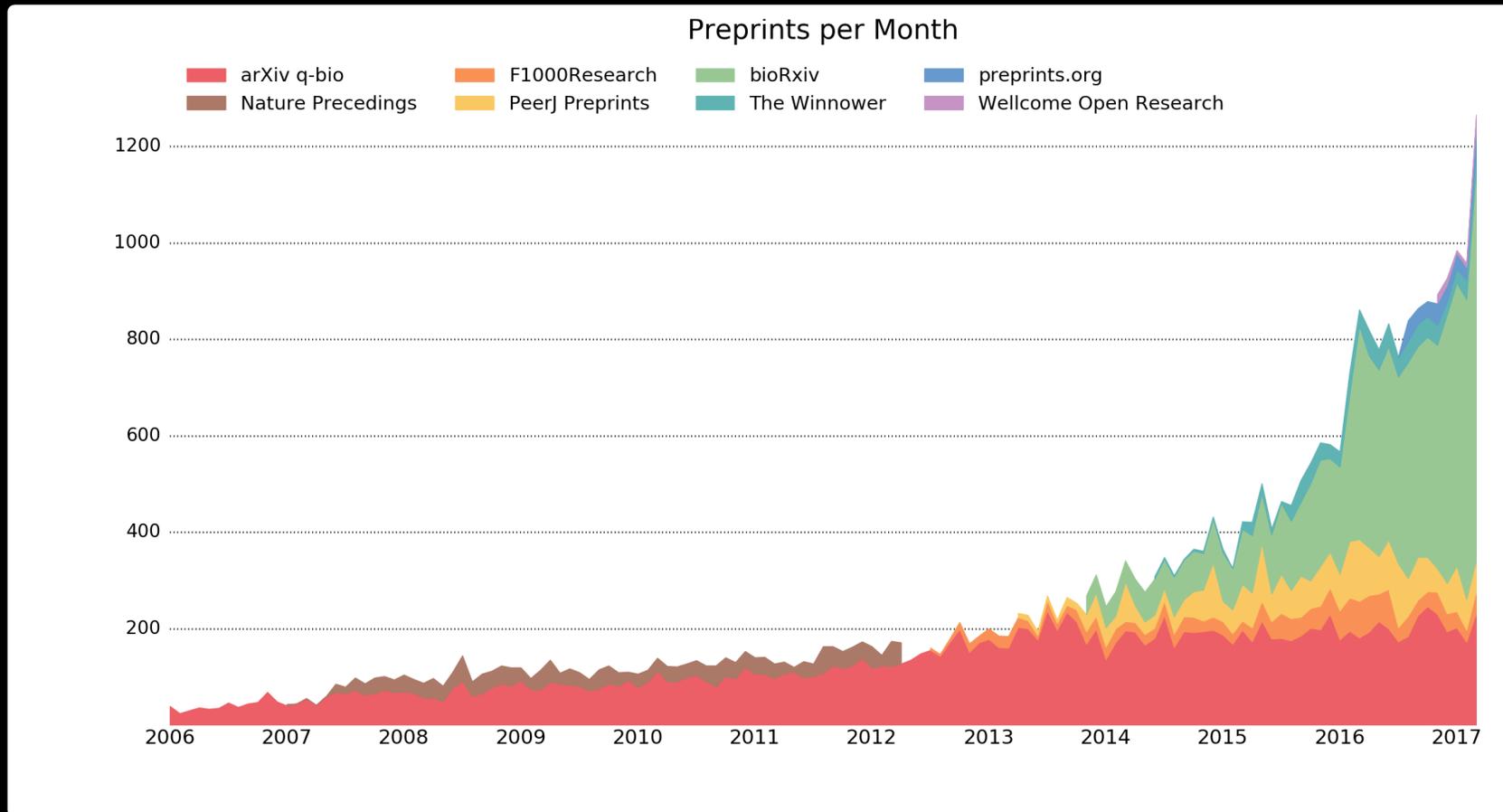
**Jeremy M. Berg<sup>1</sup>, Needhi Bhalla<sup>2</sup>, Philip E. Bourne<sup>3</sup>, Martin Chalfie<sup>4</sup>, David G. Drubin<sup>5</sup>, James S. Fraser<sup>6</sup>, Carol W. Greider<sup>7</sup>, Michael Hendricks<sup>8</sup>, Chonnetia Jones<sup>9</sup>, Robert Kiley<sup>9</sup>, Susan King<sup>10</sup>, Marc W. Kirschner<sup>11</sup>, Harlan M. Krumholz<sup>12</sup>, Ruth Lehmann<sup>13</sup>, Maria Leptin<sup>14</sup>, Bernd Pulverer<sup>14</sup>, Brooke Rosenzweig<sup>15</sup>, John E. Spiro<sup>16</sup>, Michael Stebbins<sup>17</sup>, Carly Strasser<sup>18</sup>, Sowmya Swaminathan<sup>19</sup>, Paul Turner<sup>20</sup>, Ronald D. Vale<sup>21</sup>, K. VijayRaghavan<sup>22</sup>, Cynthia Wolberger<sup>23</sup>**

<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



Courtesy Jordan Anaya, prepubmed.org

**ChemRxiv**<sup>TM</sup>

**AgriXiv**  **PsyArXiv**

**BioRN**  
an  
**SSRN**  
NETWORK

**SciELO** *Preprints*

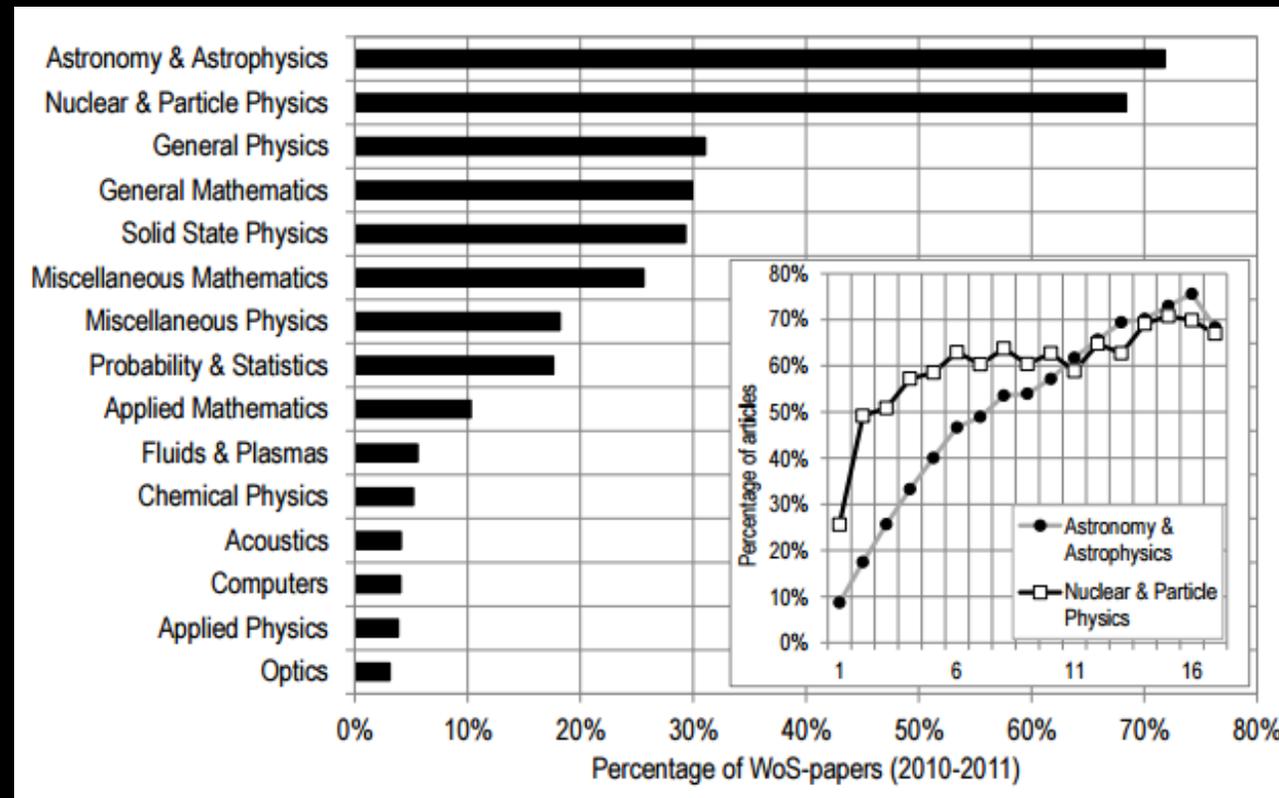
# Biology preprints in perspective



PubMed: ~100,000 articles  
per month

All life sciences preprint  
servers: ~1,000 per month

# In some physics fields, >70% of manuscripts are preprinted



Larivière et al 2013 (arXiv)

## What's different?

# Physics vs. biology

- Competition
  - Difficulty of reproduction
    - Math vs. HEP vs. Cond-mat
  - Historic precedent
- Culture

\* <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/>

## Funding rates

NSF 2016

Astronomy

22%\*

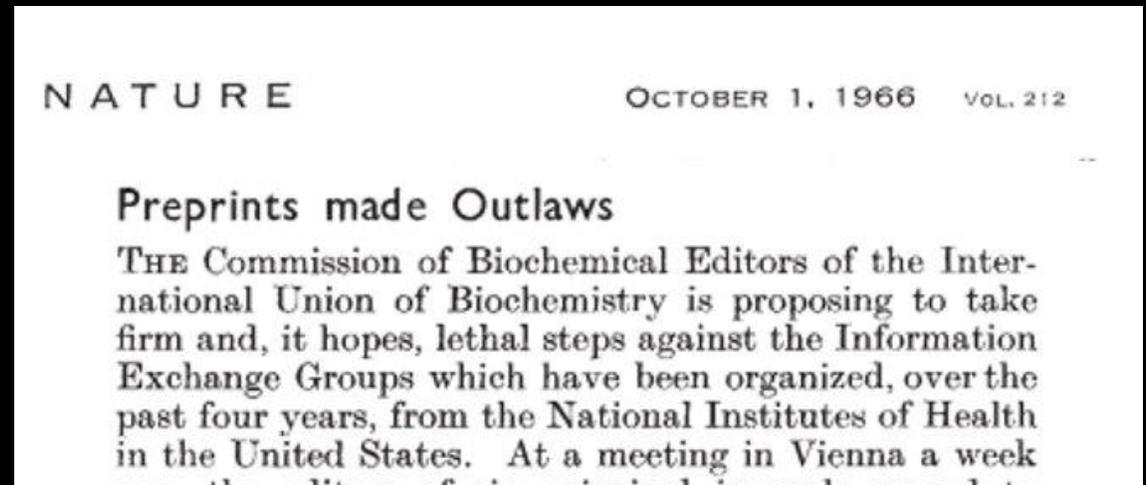
NSF 2016 Physics

33%\*

NIH 2014 RPG

18.1% \*\*

## NIH Information Exchange Groups (1960s)



*More at:*

*Predecessors of preprint servers*

*Learned Publishing 2001; 14(1): 7-13*

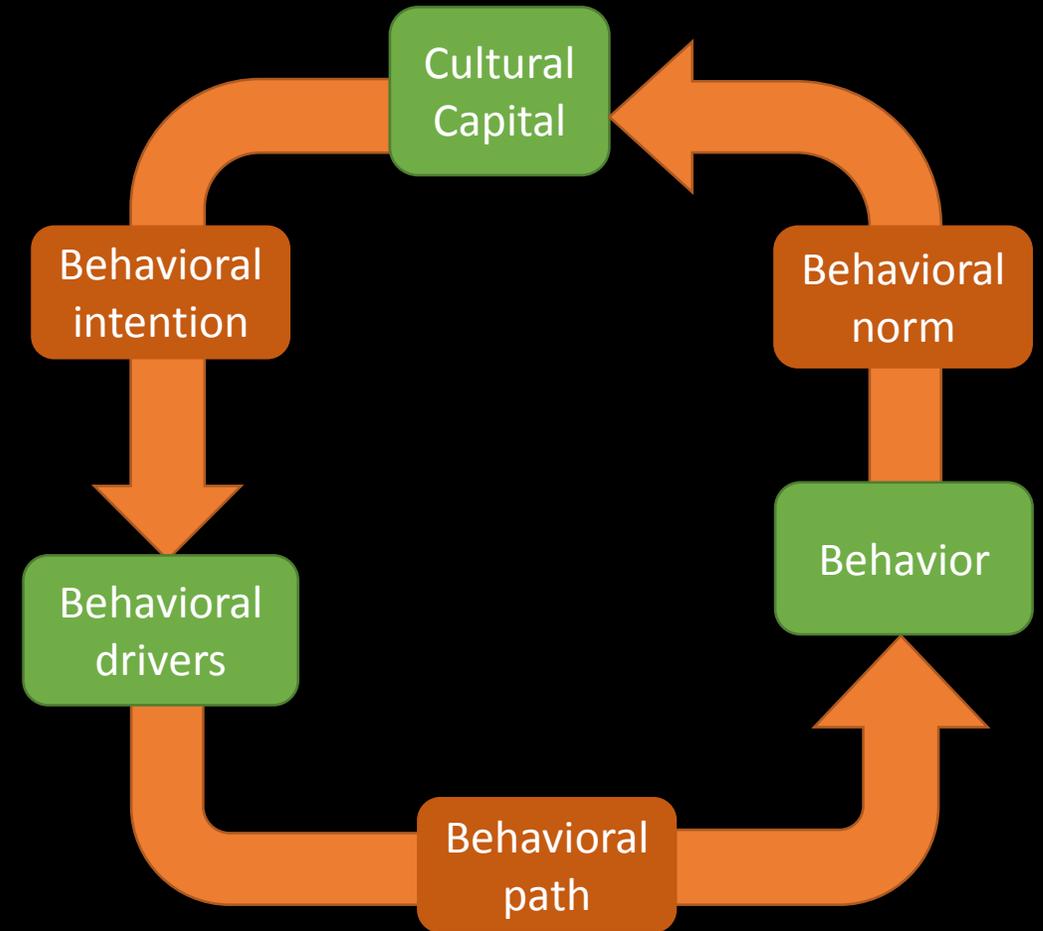
[arXiv:physics/0102004v1](https://arxiv.org/abs/physics/0102004v1) [*physics.soc-ph*] 4 Feb 2001

*James E. Till, The University of Toronto*

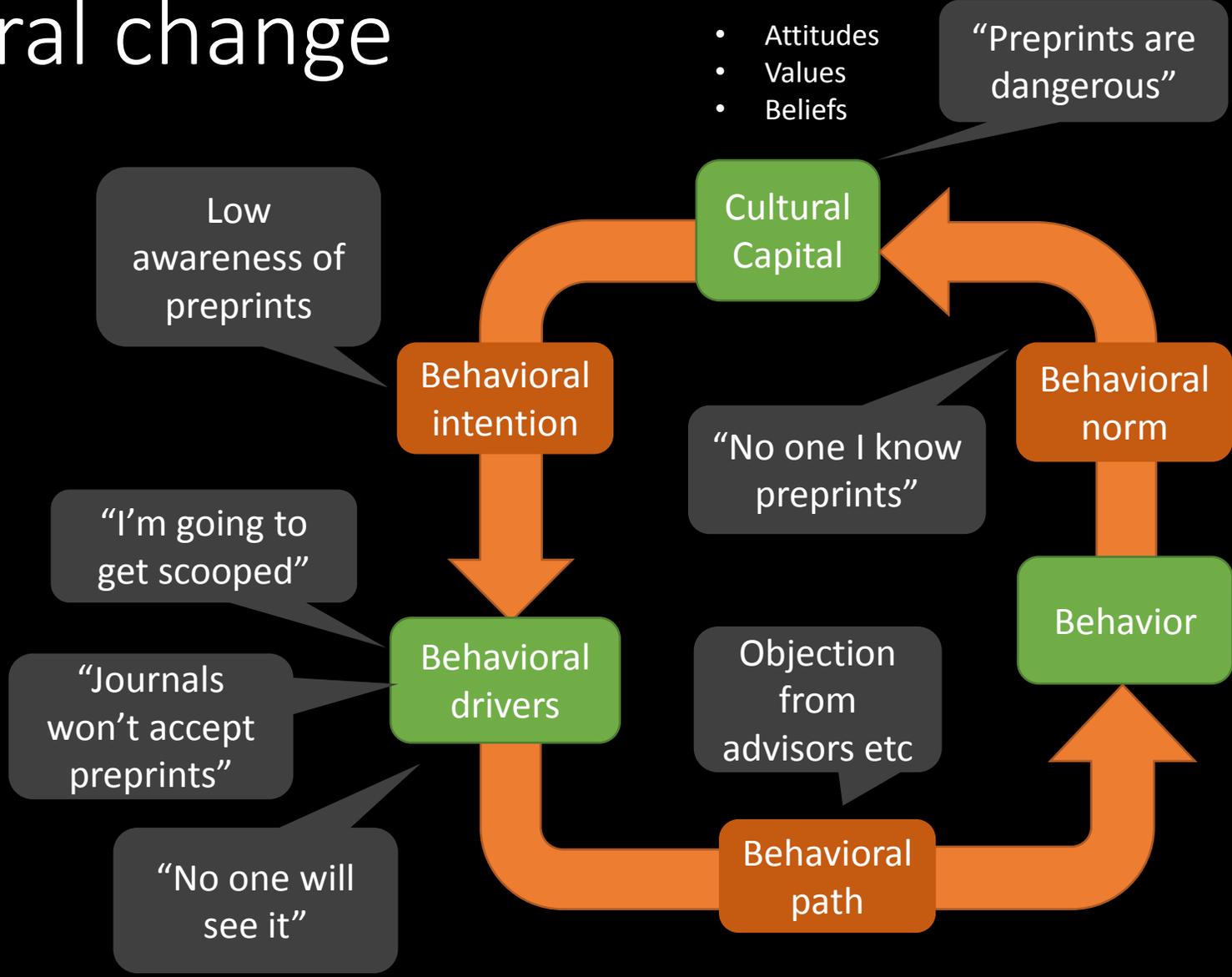
How can we promote culture change?

# The cycle of cultural change

- Attitudes
- Values
- Beliefs



# The cycle of cultural change

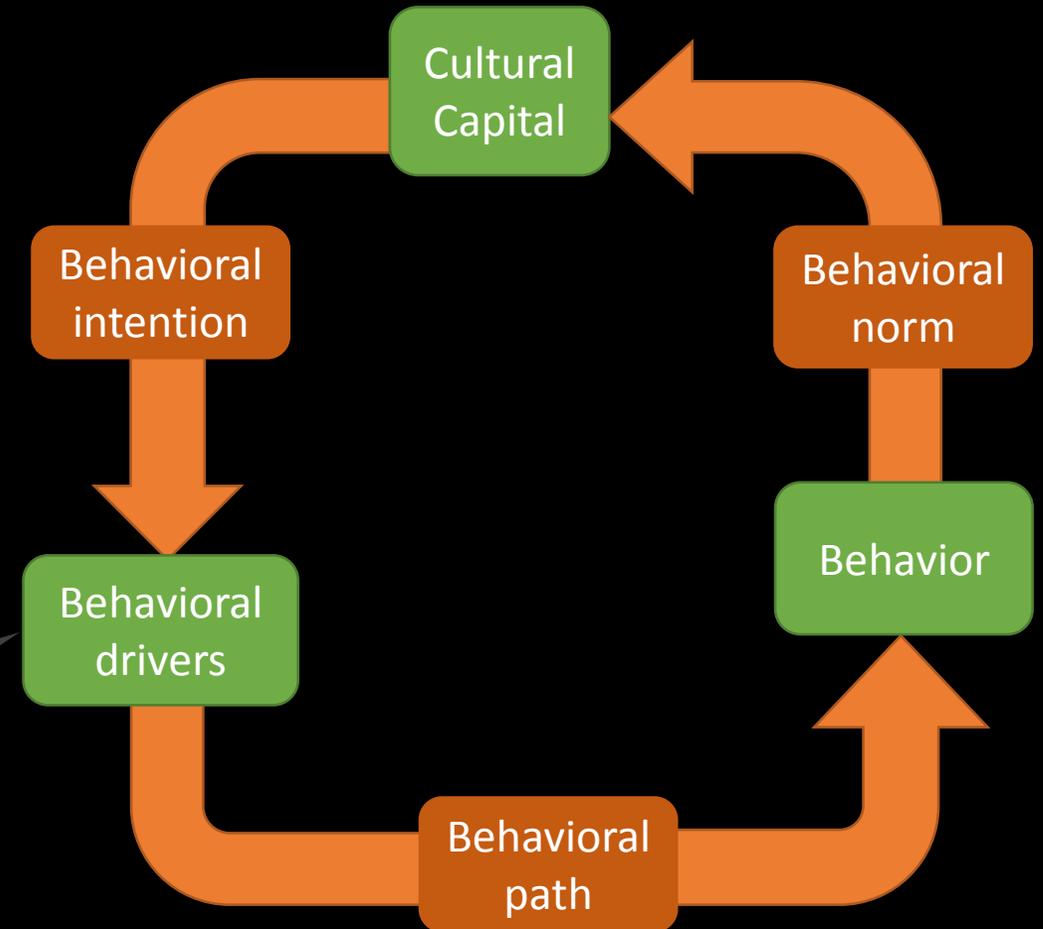


Adapted from Knott, Muers, Aldridge, 2008. Achieving Culture Change: A Policy Framework. UK Cabinet Office Strategy Unit.

# The cycle of cultural change

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

- Attitudes
- Values
- Beliefs



Adapted from Knott, Muers, Aldridge, 2008. Achieving Culture Change: A Policy Framework. UK Cabinet Office Strategy Unit.

Funders are major leaders in  
biology preprint adoption

# Funder policies

MRC Medical Research Council  
Leading science for better health

HOME FUNDING OUR RESEARCH OUR SUCCESSES INNOVATION SKILLS & CAREERS NEWS

Home > News > News and features > The MRC supports preprints

HFSP HUMAN FRONTIER SCIENCE PROGRAM  
FUNDING FRONTIER RESEARCH INTO

Supported by [Flags]

Funding

Awardees

You are here: Home >

Funding

- Eligible countries
- What is HFSP?

Use of preprints

CANCER RESEARCH UK  
Let's beat cancer sooner

Donate

HOME ABOUT CANCER SUPPORT US OUR RESEARCH FUNDING FOR RESEARCHERS SHOP ABOUT US

Home > Funding for researchers > Research features > We accept preprints in grant applications: new guidance for researchers

## We accept preprints in grant applications: new guidance for researchers

Category: Research

hhmi | Howard Hughes Medical Institute

Science

### Public Access to Publications

HHMI laboratory heads may also wish to consider depositing at The Institute recognizes deposited, publicly-available preprints : them for purposes such as laboratory head reviews.

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.

News

Search

## Preprints will permit researchers to cite their reviewed manuscripts, in and end-of-grant review

lic draft of a scientific document, yet



Credit: Wellcome

Robert Kiley: "We hope the ability of researchers to cite preprints will empower them to communicate their research findings more quickly."

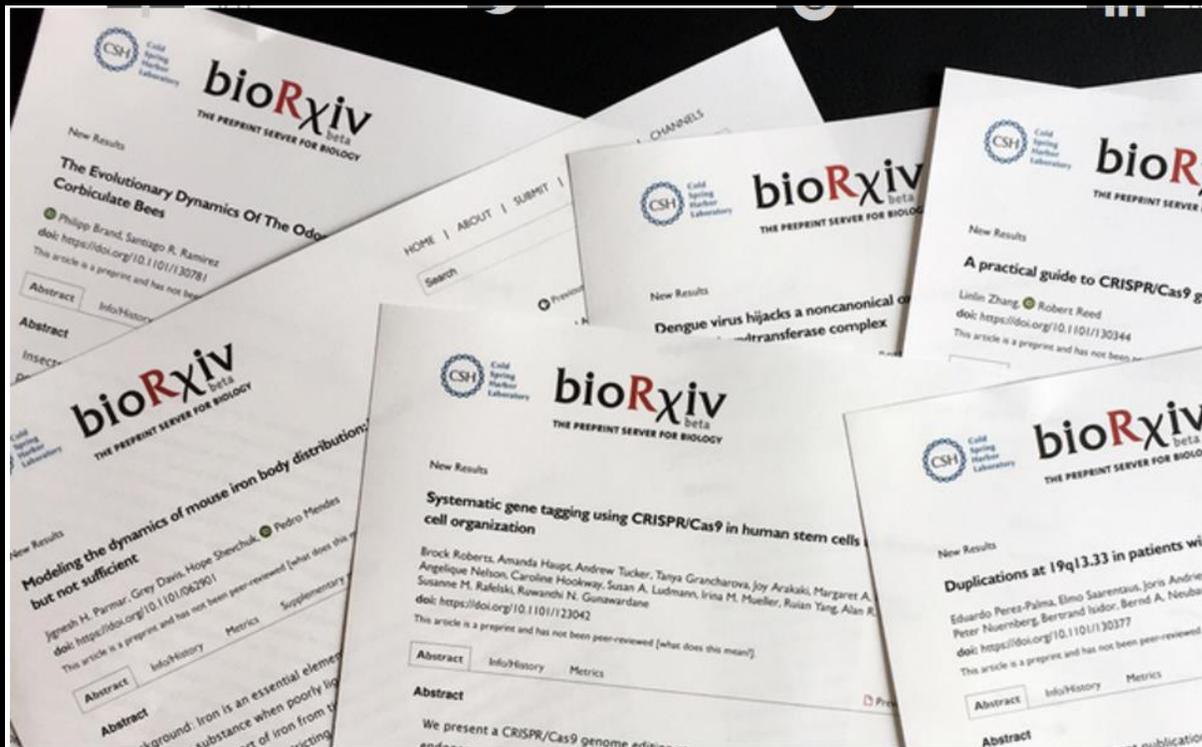
se reviewing grant applications) to researchers' work



CHAN  
ZUCKERBERG  
INITIATIVE

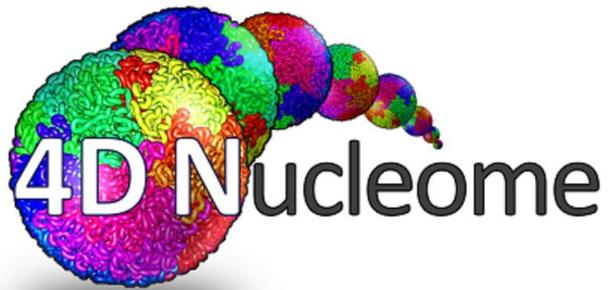
“In the interests of accelerating scientific discovery, the Biohub will establish a publication policy for open and rapid dissemination of research results: all Investigators **will be required to post manuscripts on Arxiv on the date of submission to peer-reviewed journals.**”

[https://med.stanford.edu/rmg/funding/chan\\_zuckerberg.html](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



*A project of the NIH  
common fund*



## 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

 [Rights & Permissions](#)

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



## 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](#))

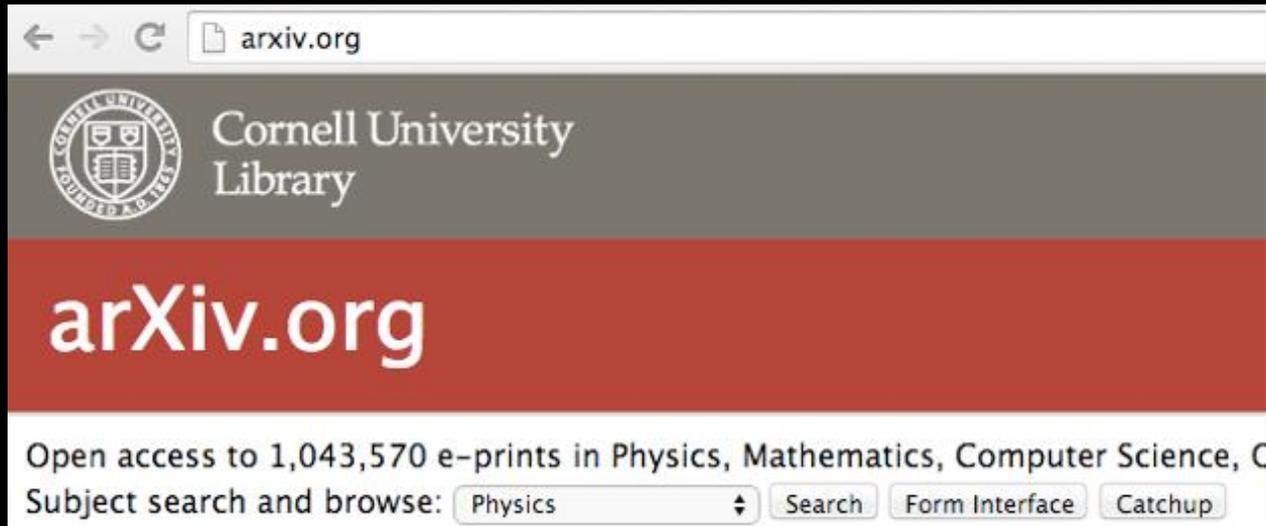
### Purpose

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.

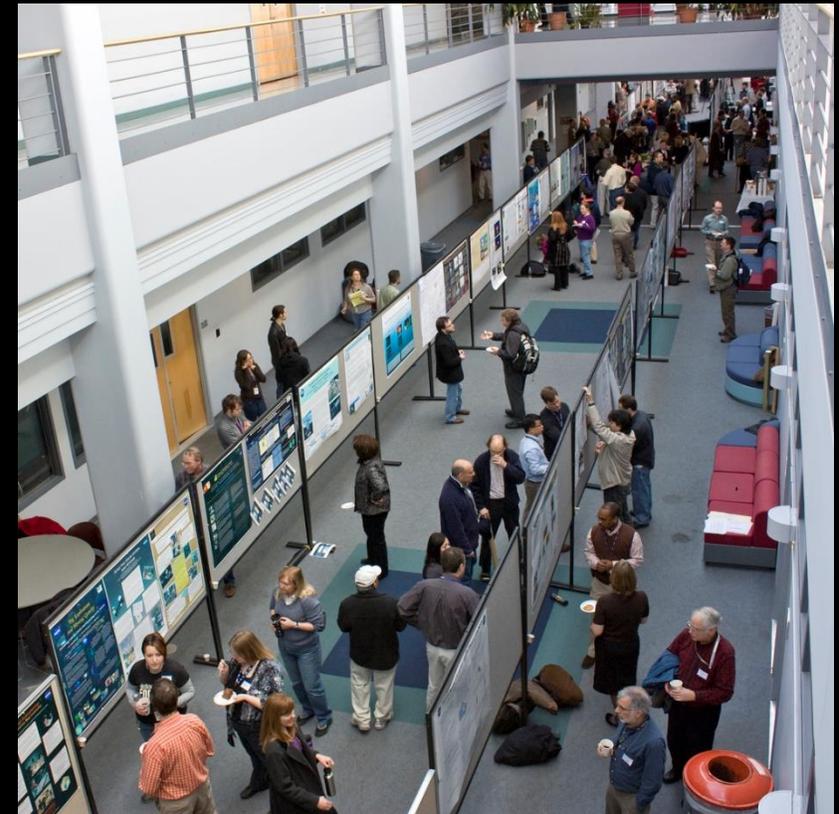
Cultural change is slower

7 concerns about preprints

# Concern 1: We can't be trusted to share our work before peer review



- Reputation is important



Flickr/NASA Goddard



# Concern 3: Journals won't accept my preprint

Nature and Nature journals,  
Science,  
PNAS,  
Cell,  
J. Biol. Chemistry  
MBoC,  
eLife,  
J. Cell Biology,  
EMBO,  
ASM journals,  
Oxford Press journals,  
Genetics,  
J. Neuroscience,  
.....

Article Talk

## List of academic journals by preprint policy

From Wikipedia, the free encyclopedia

**This article has multiple issues.** Please help [improve it](#) or discuss the issues on the [talk page](#) ([messages](#))

This is a list of [academic journals](#) by their submission policies regarding the use of [preprints](#) prior to publication. They routinely accept manuscripts that have been posted to preprint servers.

**Contents** [\[hide\]](#)

- 1 Publishers with unified policies
- 2 Individual journals
- 3 See also
- 4 References

### Publishers with unified policies [\[edit source\]](#)

Publisher	Policy type	
American Association for Cancer Research (AACR)	Incompatible	Submission page does not explicitly mention preprints, but numerous preprint has been submitted.
American Institute of Physics (AIP)	Compatible	"Author-prepared files only may be used; files prepared and/or formatted in the online journals and proceedings) may not be used for this purpose"
American		From the submission FAQ: "E-print number, e.g., 0804.1718, assigned"

Contains links to original policies

# ICMJE recommendations, December 2016

Annotations are inserted here to assist in identifying changes made in Decemeber 2016

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

Updated December 2015 ← 6

Document is available at [www.icmje.org](http://www.icmje.org)

- 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

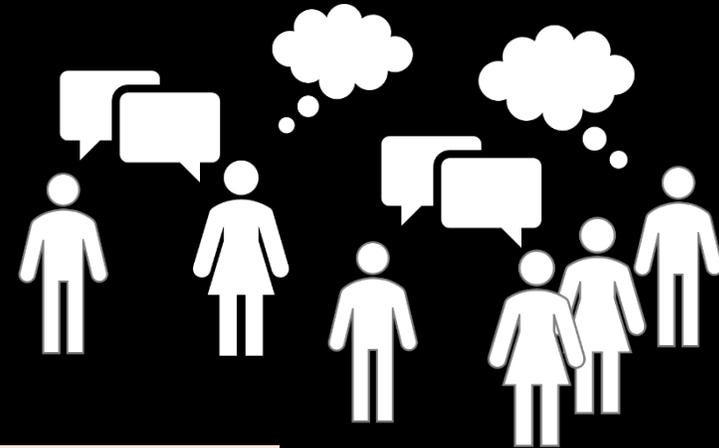
that has already been reported in large part in a published article or is contained in or closely related to another paper that has been submitted or accepted for publication elsewhere, the letter of submission should clearly say so and the authors should provide copies of the related material to help the editor decide how to handle the submission. See also Section IV.B.

**, a preprint,**  
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

*Preprint server*



THE  
**FASEB** JOURNAL  
The Official Journal of the Federation of American Societies for Experimental Biology

“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



October 4, 2016

Editors-in-Chief

Section Editors

Front Section Editors

Associate Editors

Preprint Editors

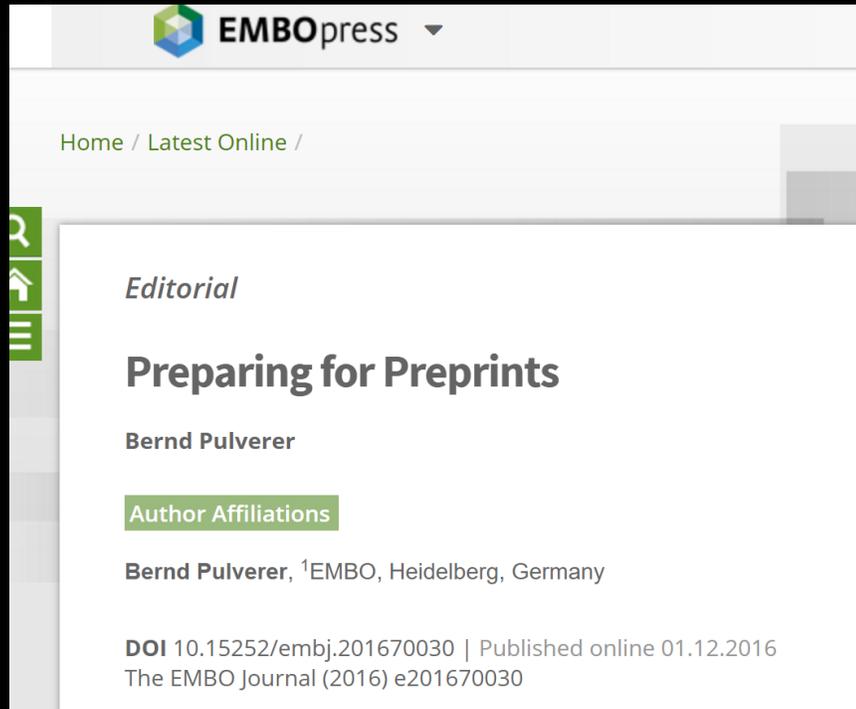
Consulting Editors

## Editorial Board

Over 140 members of the genetics community submitted manuscripts meet the journal's

The editorial process is run as a partnership with experts who act as Associate Editors.

# Removing pressure from peer review



EMBOpress

Home / Latest Online /

*Editorial*

## Preparing for Preprints

Bernd Pulverer

**Author Affiliations**

Bernd Pulverer, <sup>1</sup>EMBO, Heidelberg, Germany

DOI 10.15252/emj.201670030 | Published online 01.12.2016  
The EMBO Journal (2016) e201670030

“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.”



THE SCHOLARLY  
**kitchen**

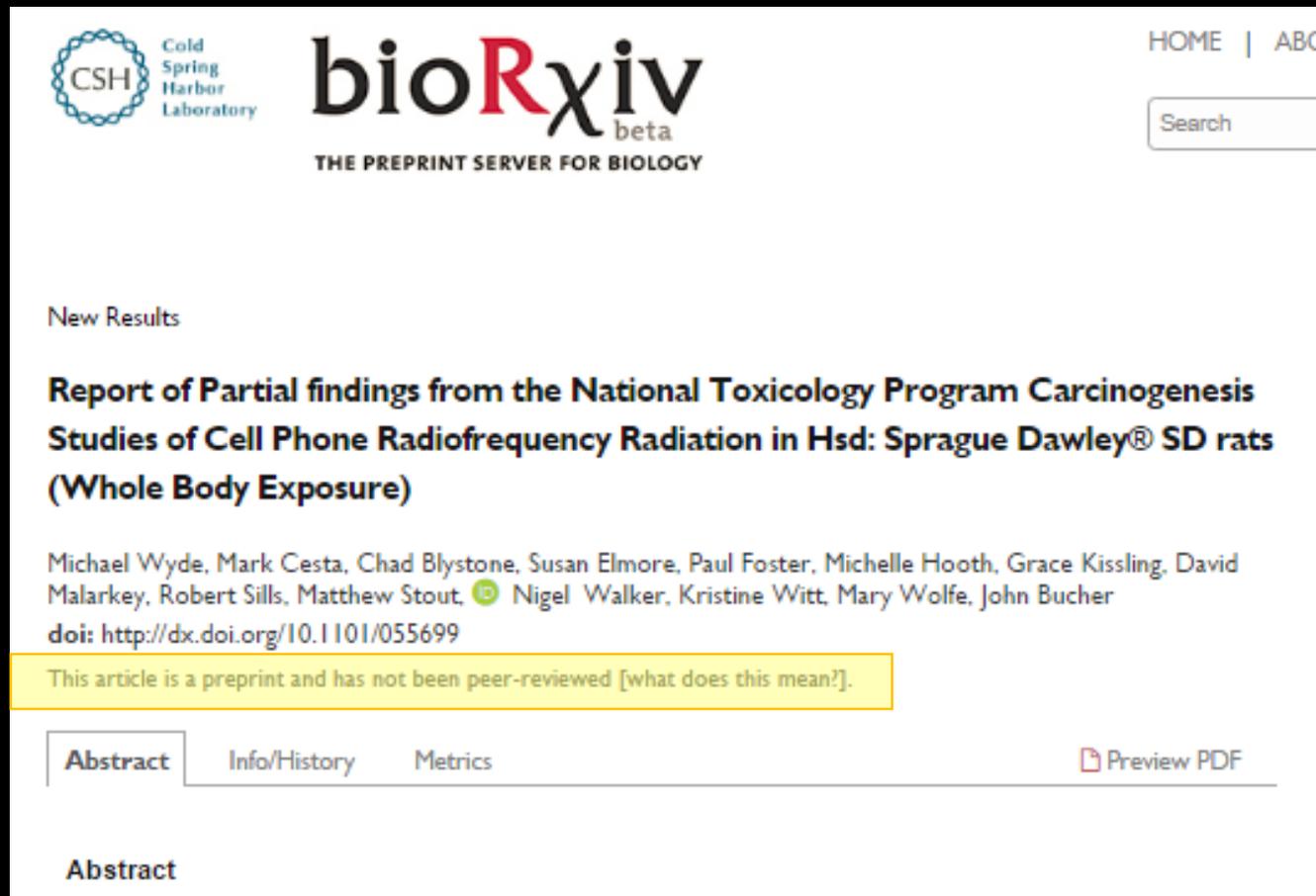
## The Tincture of Time – Should Journals Return to Slower Publishing Practices?

By **KENT ANDERSON** | MAR 28, 2017  
**23 COMMENTS**

“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



CSH Cold Spring Harbor Laboratory

**bioRxiv** beta  
THE PREPRINT SERVER FOR BIOLOGY

HOME | ABO

Search

New Results

**Report of Partial findings from the National Toxicology Program Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley® SD rats (Whole Body Exposure)**

Michael Wyde, Mark Cesta, Chad Blystone, Susan Elmore, Paul Foster, Michelle Hooth, Grace Kissling, David Malarkey, Robert Sills, Matthew Stout,  Nigel Walker, Kristine Witt, Mary Wolfe, John Bucher

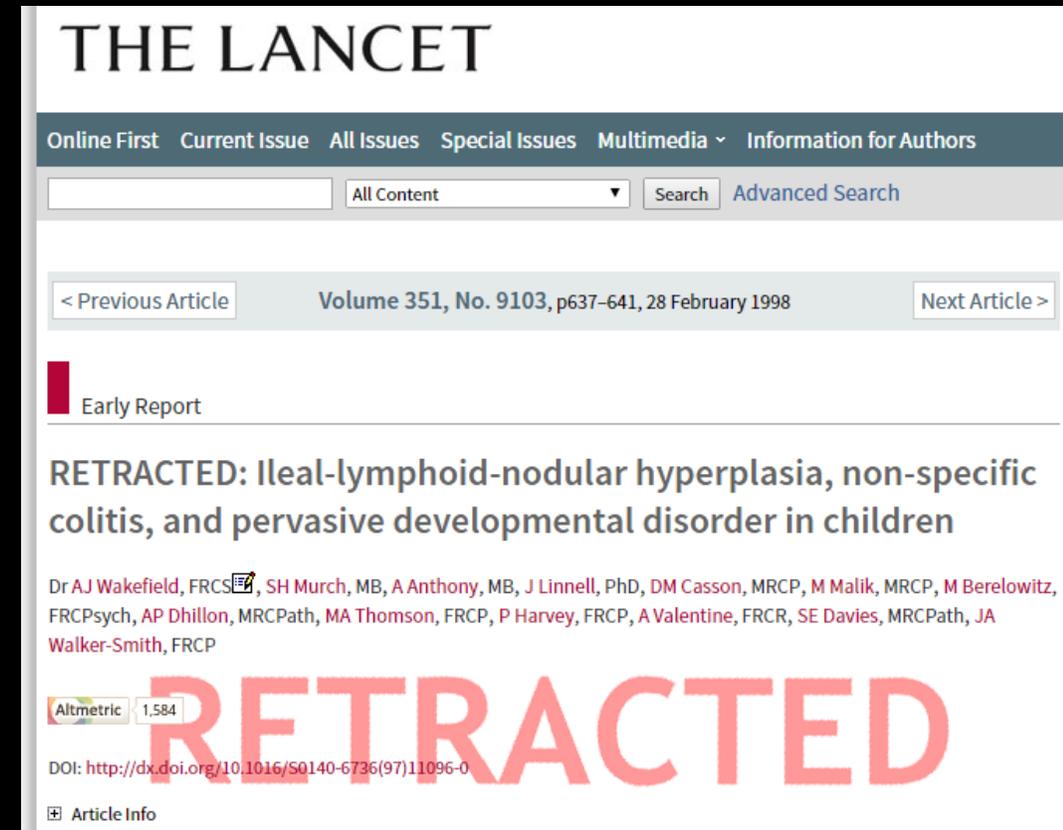
doi: <http://dx.doi.org/10.1101/055699>

This article is a preprint and has not been peer-reviewed [what does this mean?].

Abstract Info/History Metrics  Preview PDF

Abstract

## Vaccines & autism



THE LANCET

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All Content Search Advanced Search

< Previous Article Volume 351, No. 9103, p637-641, 28 February 1998 Next Article >

Early Report

**RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children**

Dr AJ Wakefield, FRCS , SH Murch, MB, A Anthony, MB, J Linnell, PhD, DM Casson, MRCP, M Malik, MRCP, M Berelowitz, FRCPsych, AP Dhillon, MRCPsych, MA Thomson, FRCP, P Harvey, FRCP, A Valentine, FRCP, SE Davies, MRCPsych, JA Walker-Smith, FRCP

Altmetric 1,584

DOI: [http://dx.doi.org/10.1016/S0140-6736\(97\)11096-0](http://dx.doi.org/10.1016/S0140-6736(97)11096-0)

Article Info

**RETRACTED**

# Concern 5: How can we ensure ethical disclosure of data?

Screening standards/expectations are needed



The image is a screenshot of a web article from the website 'GEEK'. The article title is 'Researchers intentionally leak details of 70,000 OkCupid profiles'. The author is Meredith Placko, and the article was published on May 16, 2016, at 1:44 pm. The article has 0 shares. The article features a large image of three padlocks (two blue, one red) on a background of binary code. The article also includes a newsletter sign-up form with a 'SUBMIT' button and a link to follow @geekdotcom on Twitter.

**GEEK** APPLE ANDROID PS4 SCIENCE! GAMING

Twitter Facebook RSS Search Geek

## Researchers intentionally leak details of 70,000 OkCupid profiles

By [Meredith Placko](#) May 16, 2016 1:44 pm [mplacko](#)

0 shares [f](#) [t](#) [G+](#) [r](#)

[Follow @geekdotcom](#)

[Like Geek](#)

**GEEK**  
NEWSLETTER

Email Address... [SUBMIT](#)

Subscribing to a newsletter indicates your consent to our [Terms of Use](#) and [Privacy Policy](#).

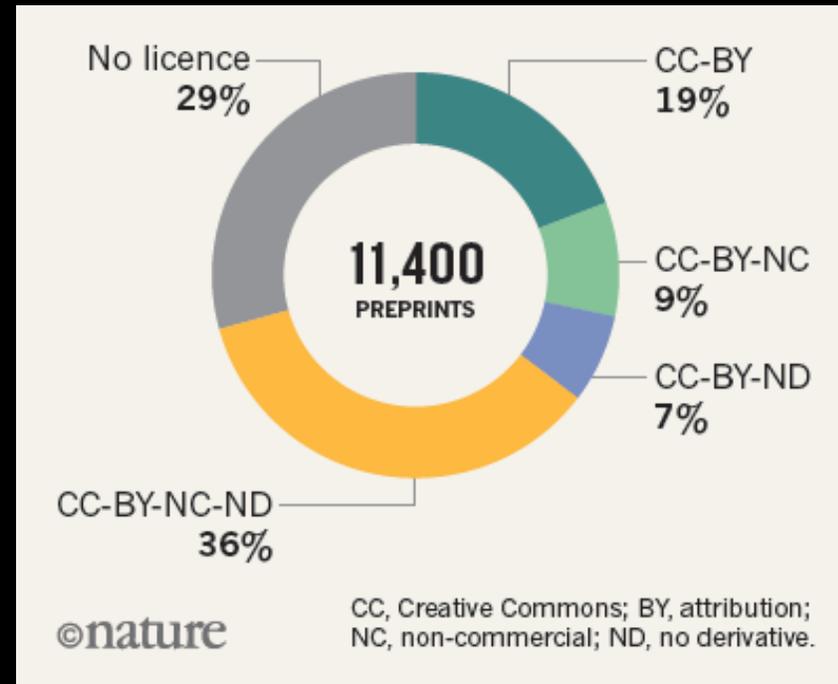


# Concern 6: How should preprints be licensed?



“To maximize the impact of an interim research product, the NIH strongly encourages awardees to select a Creative Commons Attribution ([CC-BY](#)) license or dedicate their work to the [public domain](#). ”

bioRxiv licenses over time



Daniel Himmelstein



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

NATURE | NEWS

## Biologists debate how to license preprints

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

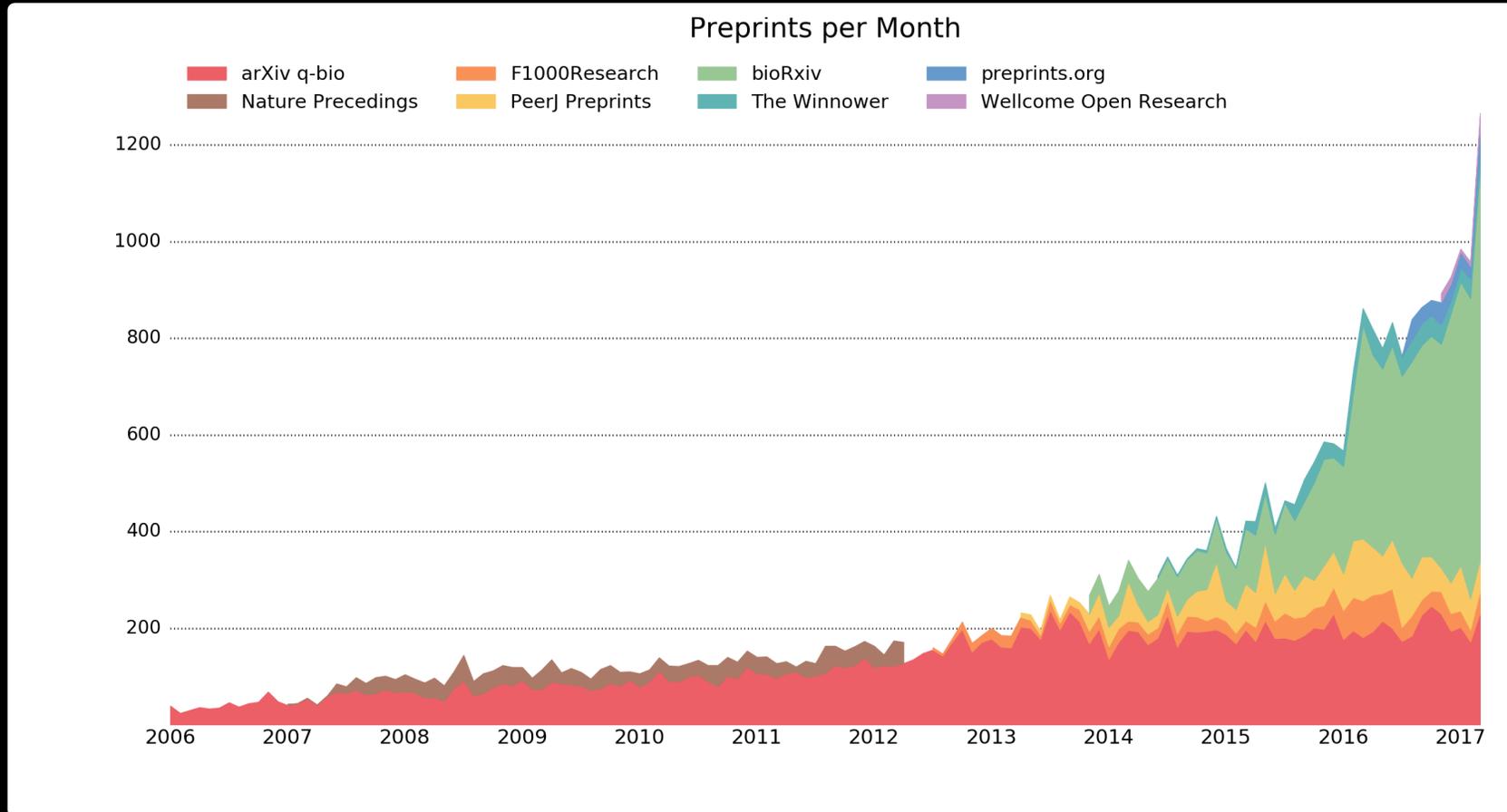
Lindsay McKenzie

16 June 2017

We have established a task force on licensing

[ASAPbio.org/licensing](https://www.asapbio.org/licensing)

# Concern 7: what is a preprint, & how to find it?



Courtesy Jordan Anaya, prepubmed.org

Different policies & resources for archiving, screening, access



# 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

Wellcome Trust  
NIH  
MRC (UK)  
Helmsley Trust  
HHMI  
ERC  
Simons Foundation  
CIHR  
Alfred P. Sloan Foundation  
Dept of Biotechnology, India  
LJAF

# Major discussions

<http://asapbio.org/plans-for-cs>

- 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](mailto: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)

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Jessica.polka@asapbio.org  
@jessicapolka