



# Science Preprints

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Health Research Alliance, Bethesda MD, September 27, 2016



Preprint ( $n$ ): a complete but unpublished manuscript yet to be certified by peer review

Because the process of peer review and journal publication can be lengthy, authors distribute manuscripts as “preprints” ***before*** peer review, allowing other scientists to see, discuss, and comment on the findings immediately



## Preprint distribution model 1: publisher-specific, for-profit



- Author submits manuscript to a journal
- Journal makes manuscript publicly available as a preprint and manages peer review
- Journal publishes the preprints that pass peer review
- Article publication charges paid by authors support preprint distribution as well as publication



## Preprint distribution model 2: publisher-neutral, not-for-profit “Rxiv”



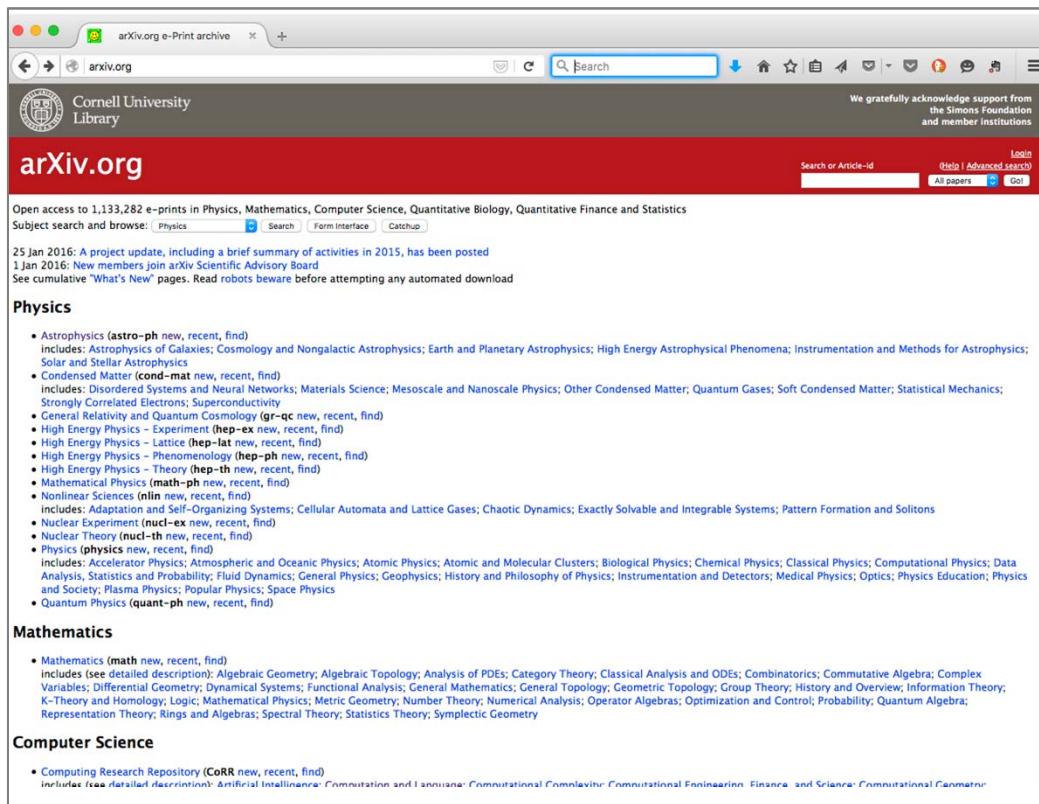
ChemRxiv



- Author posts preprint to a dedicated service
- Posting and reading preprints are free of charge
- No peer review
- Author can revise the preprint
- Author can submit the manuscript to any journal willing to consider it
- The service is supported by institutions and foundations



## arXiv.org: a service of Cornell University



- Established 1991
- Mechanism for sharing findings prior to publication & establishing priority
- Spans physics, math, engineering, computer science, quantitative biology
- >1 million preprints
- Supported by Cornell University, academic libraries, and The Simons Foundation



## bioRxiv.org: a service of Cold Spring Harbor Laboratory



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**bioRxiv**  
beta

THE PREPRINT SERVER FOR BIOLOGY

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### Subject Areas

#### All Articles

[Animal Behavior and Cognition](#)

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[Cancer Biology](#)

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[Clinical Trials](#)

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[Physiology](#)

[Plant Biology](#)

[Scientific Communication and Education](#)

[Synthetic Biology](#)

[Systems Biology](#)

[Zoology](#)

[View by Month](#)

- Established November 2013
- Spans all life sciences plus clinical trials and epidemiology
- Supported by the Laboratory and The Lourie Foundation



Cold Spring Harbor Laboratory

# Cold Spring Harbor Laboratory, NY





## Research at Cold Spring Harbor

- 600 scientific staff
- 50 research groups
  - Molecular biology and genetics
  - Cancer
  - Neuroscience
  - Plant biology
  - Genomics and bioinformatics
  - Quantitative biology



## Science education & communication at Cold Spring Harbor

### Conferences

- Meetings
- The Banbury Center
- Cold Spring Harbor Asia, Suzhou, China

### Professional education

- Residential lab and lecture courses
- Watson School of Biological Sciences

### Publishing

- Cold Spring Harbor Laboratory Press: 8 journals, 200 books



“For over 80 years, scientists worldwide have come to Cold Spring Harbor to share and debate their work with peers. bioRxiv is a crucial extension of the Laboratory’s mission in the digital age”

Dr Bruce Stillman, President



## What biologists were saying, 2012 - 2013

"It's ridiculous I have to wait months to read a paper while it goes through peer review...let me decide for myself whether it's any good"

"Think how much time is wasted!"

"I am writing a grant but the paper is not going to be published by the time I submit. The solution is a preprint server that can be referenced"



## Submission to bioRxiv

- Author choices
  - “New”, “confirmatory”, or “contradictory”
  - One of 26 subject categories
  - One of a range of licenses
- Two-stage screening
  - In-house: appropriate format, completeness, plagiarism
  - Affiliate scientists: non-science, a research paper, human health concerns
- Posting
  - Approved manuscripts post directly to the web
  - Most appear within hours of submission
  - Authors can post revisions at any time



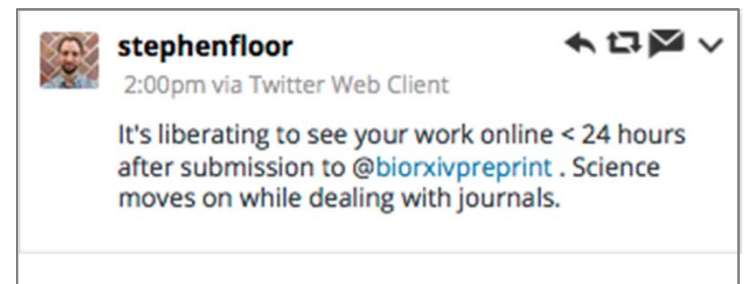
## Posted manuscripts

- Have a date-stamp and citable DOI
- Display usage metrics and altmetrics
- Display comments (moderated)
- Display links to published versions
- Are indexed in Google Scholar



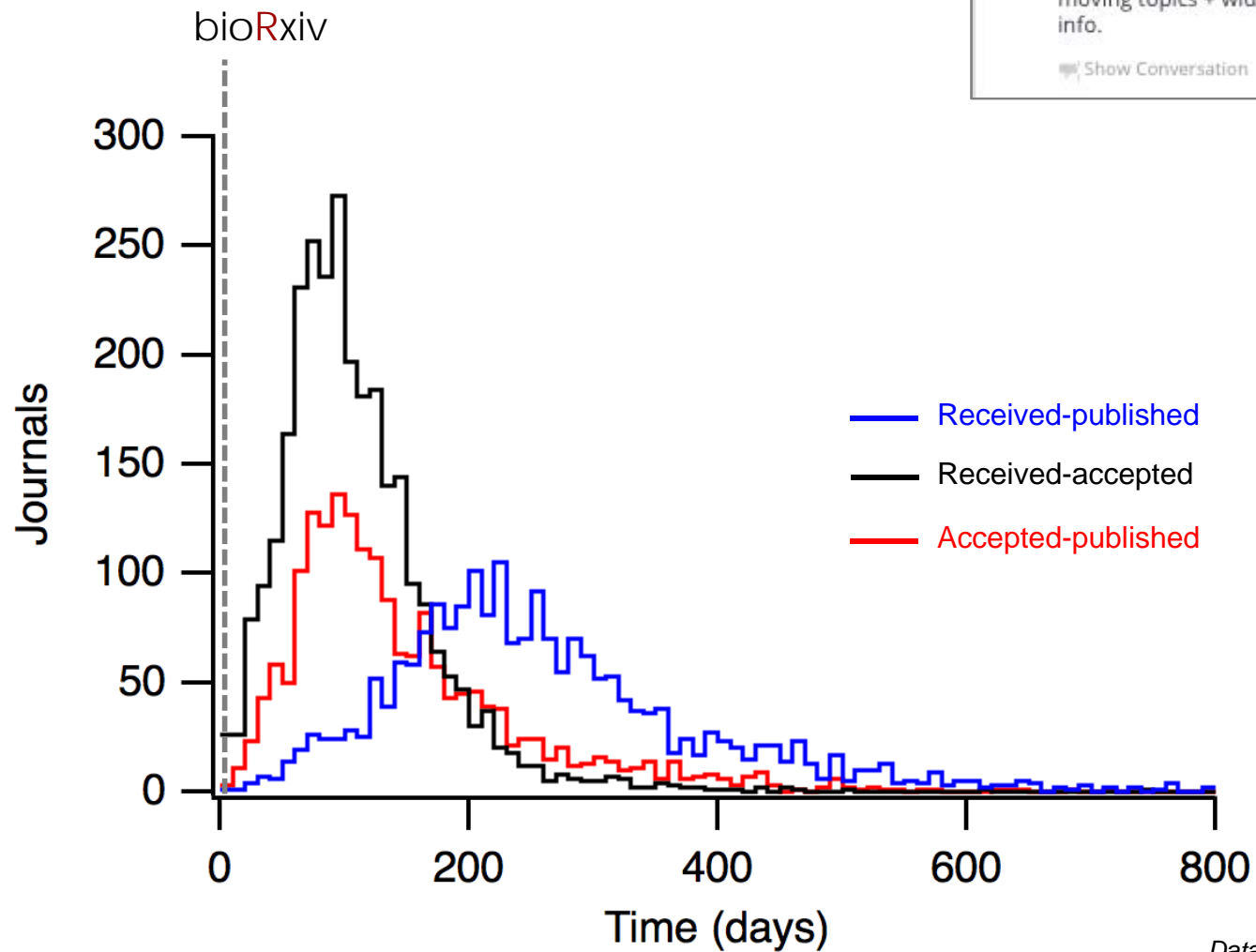
## Benefits of preprints

- Rapid transmission of results
- Pre-publication feedback/discussion
- Evidence of productivity for grant/hiring committees, especially for early-career investigators





## Accelerating communication



**clathrin**

1:44pm via Twitter for Android

@SimonBullock11 @biorxivpreprint pace of this = astounding. Preprinting a must for fast moving topics + wide dissemination of imprtnt info.

Show Conversation

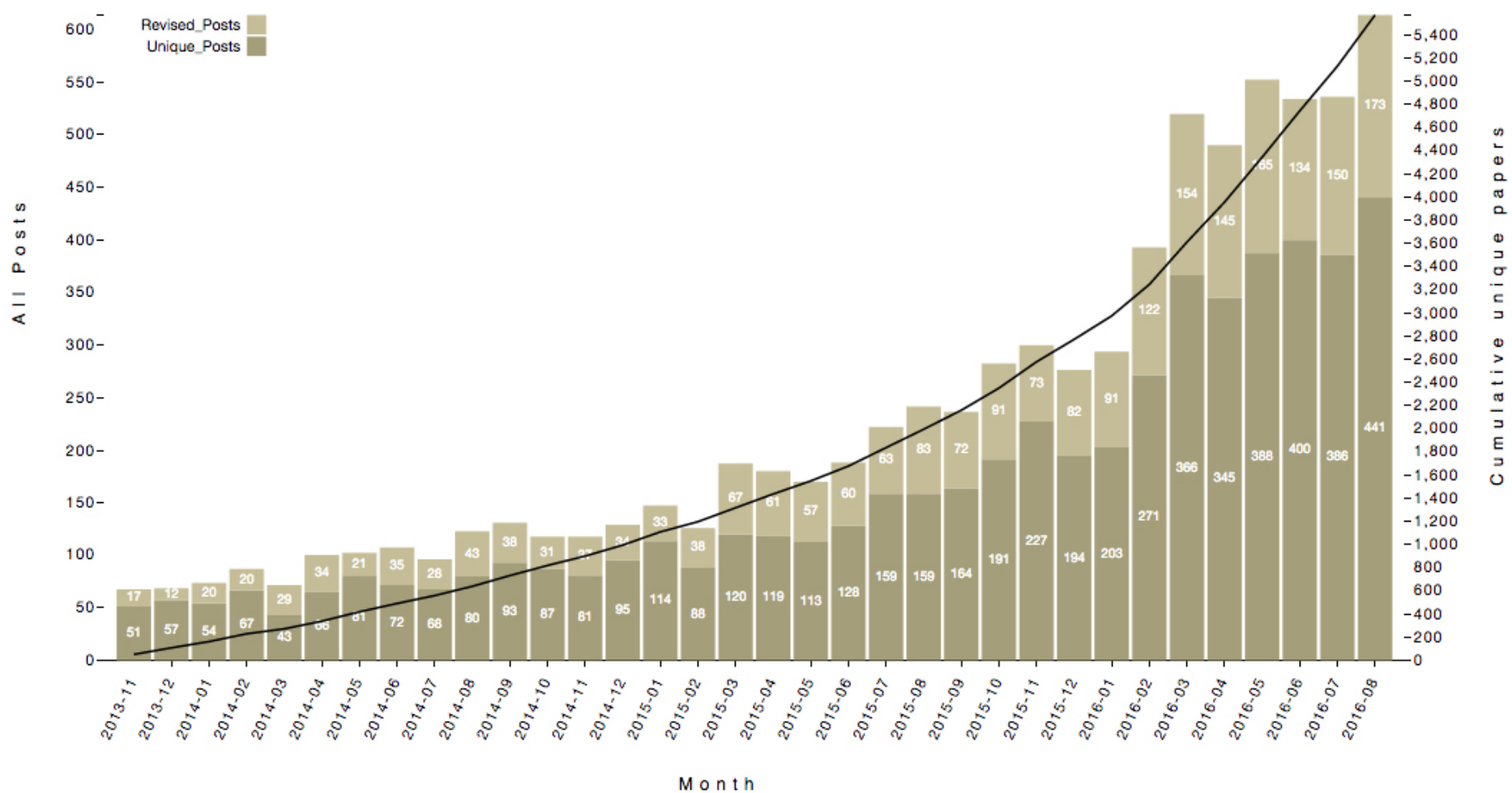


## Progress to date

- 6000 posted manuscripts (>90% approved)
  - 30% revised at least once
  - 26,000 authors
  - 2700 institutions
  - 42 countries
- Submission rate is rising each month
- 1 million article views each month
- Important science from leading centers
- Extraordinary enthusiasm from scientists worldwide

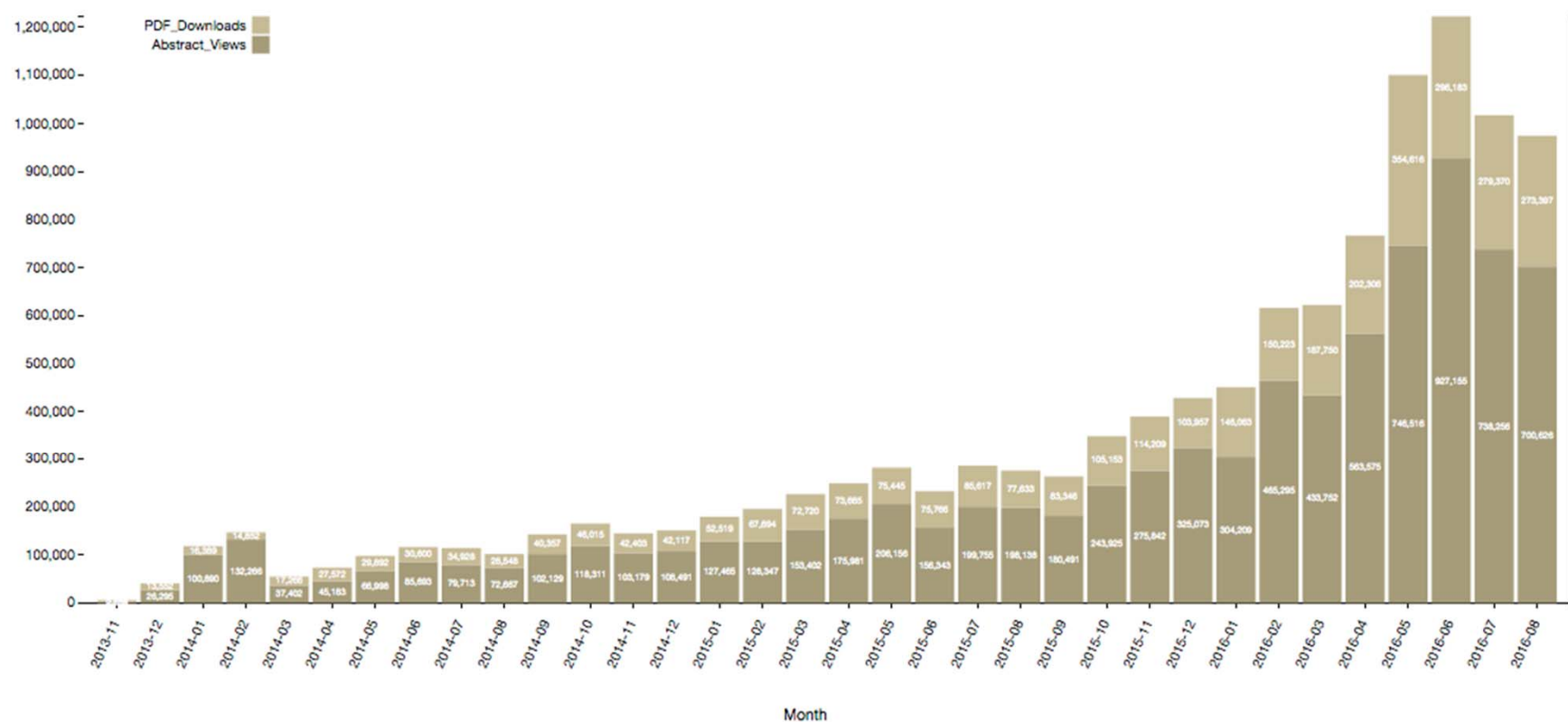


## bioRxiv Content by Month



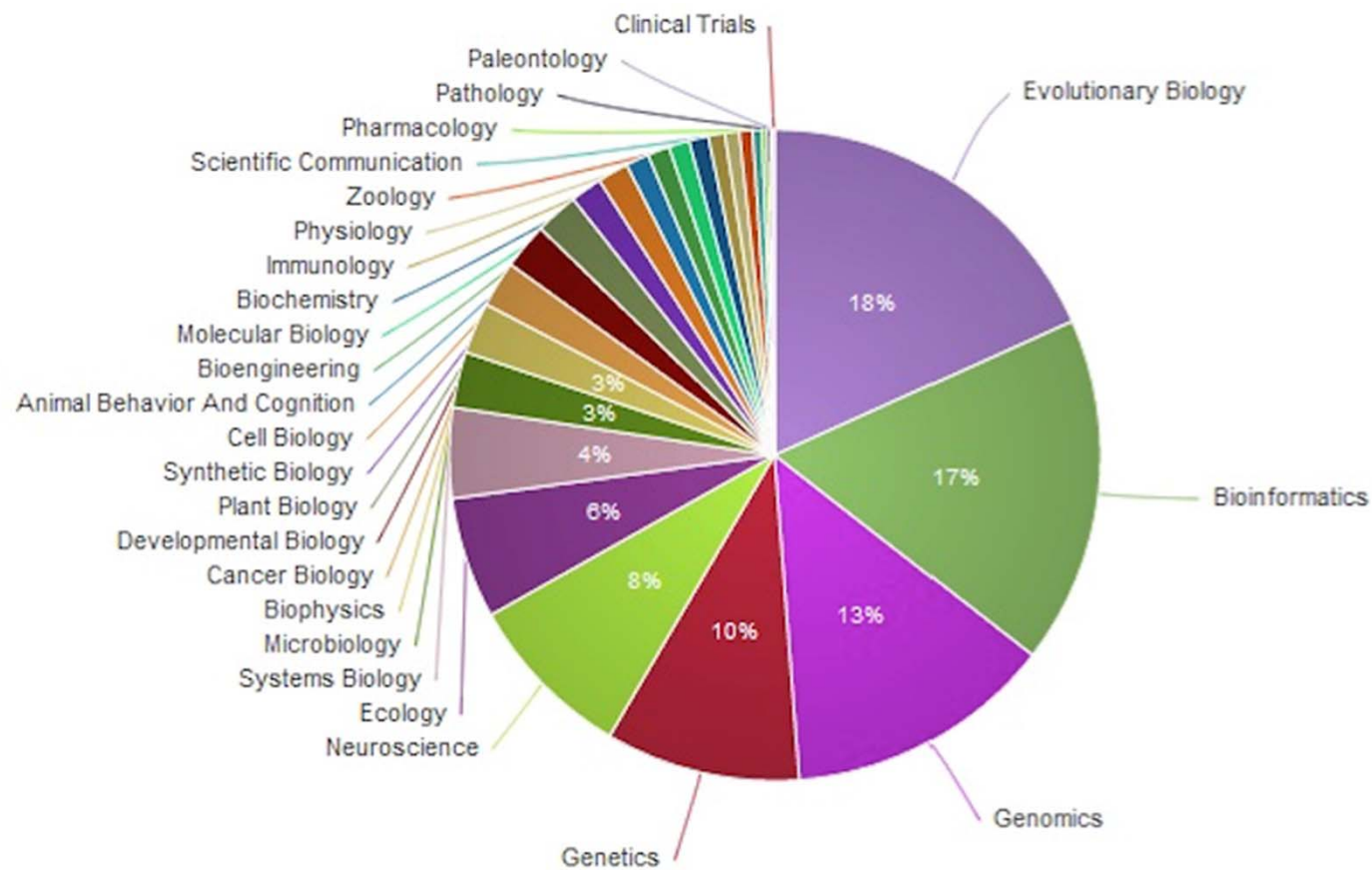


## bioRxiv Usage (HW stats) by Month



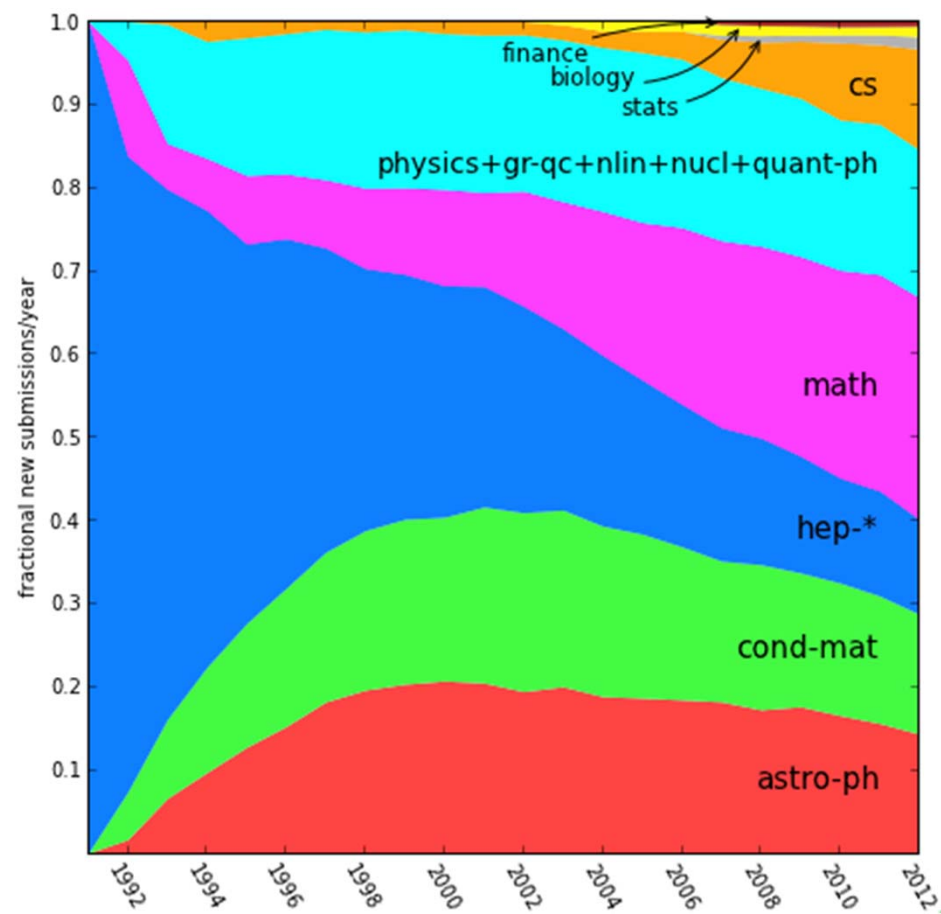


## bioRxiv by subject





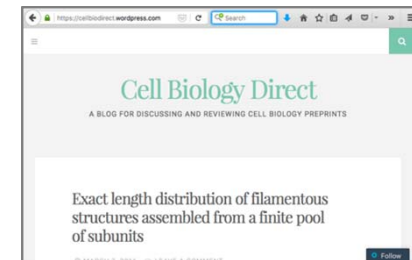
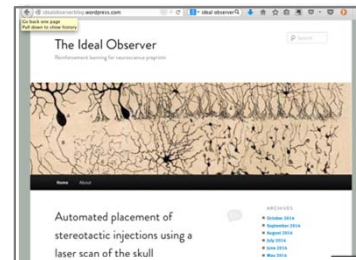
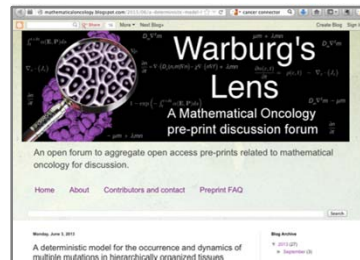
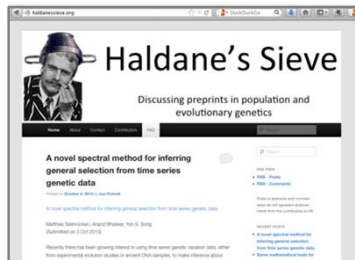
## arXiv by subject



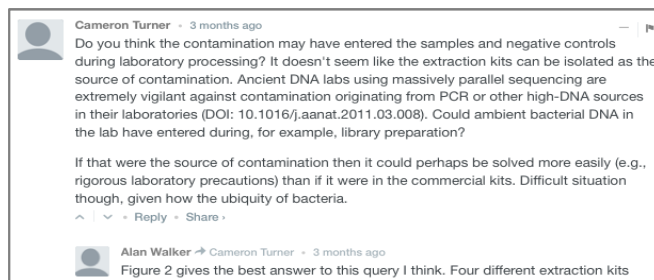


## Feedback/discussion

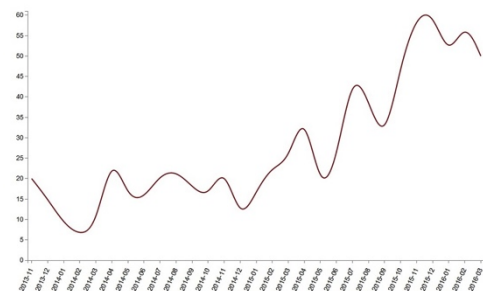
### Blogs



### Direct commenting



bioRxiv Comments by Month



### Social media



### Email





## Preprint publication

- 2 years after posting, 60% of manuscripts have been published in journals
- >320 journals have published papers first posted to bioRxiv
  - Including the most selective and broadly based
  - Including both open access and subscription-based journals
  - Interval between posting and publication is 2 months to 2 years, median 157 days



## New tools for preprint discovery



University of Pittsburgh  
Health Sciences Library System

Journals & Articles



Books



More Resources

[HSL Home](#) > [Resources](#) >

**search.bioPreprint**

**Comprehensively search preprint databases to discover cutting edge, yet-to-be published or reviewed biomedical research articles.**

Omnes Res




Advanced

**PrePubMed**

PrePubMed indexes preprints from arXiv q-bio, PeerJ Preprints, Figshare, bioRxiv, F1000Research, preprints.org, and The Winnower. Articles are not stored on PrePubMed, but you will be linked to the article at the respective site.



## New tools for preprint discovery

 Open Science Framework


Browse ▾Support

Sign UpSign in

OSF Preprints

Add a preprintSearch

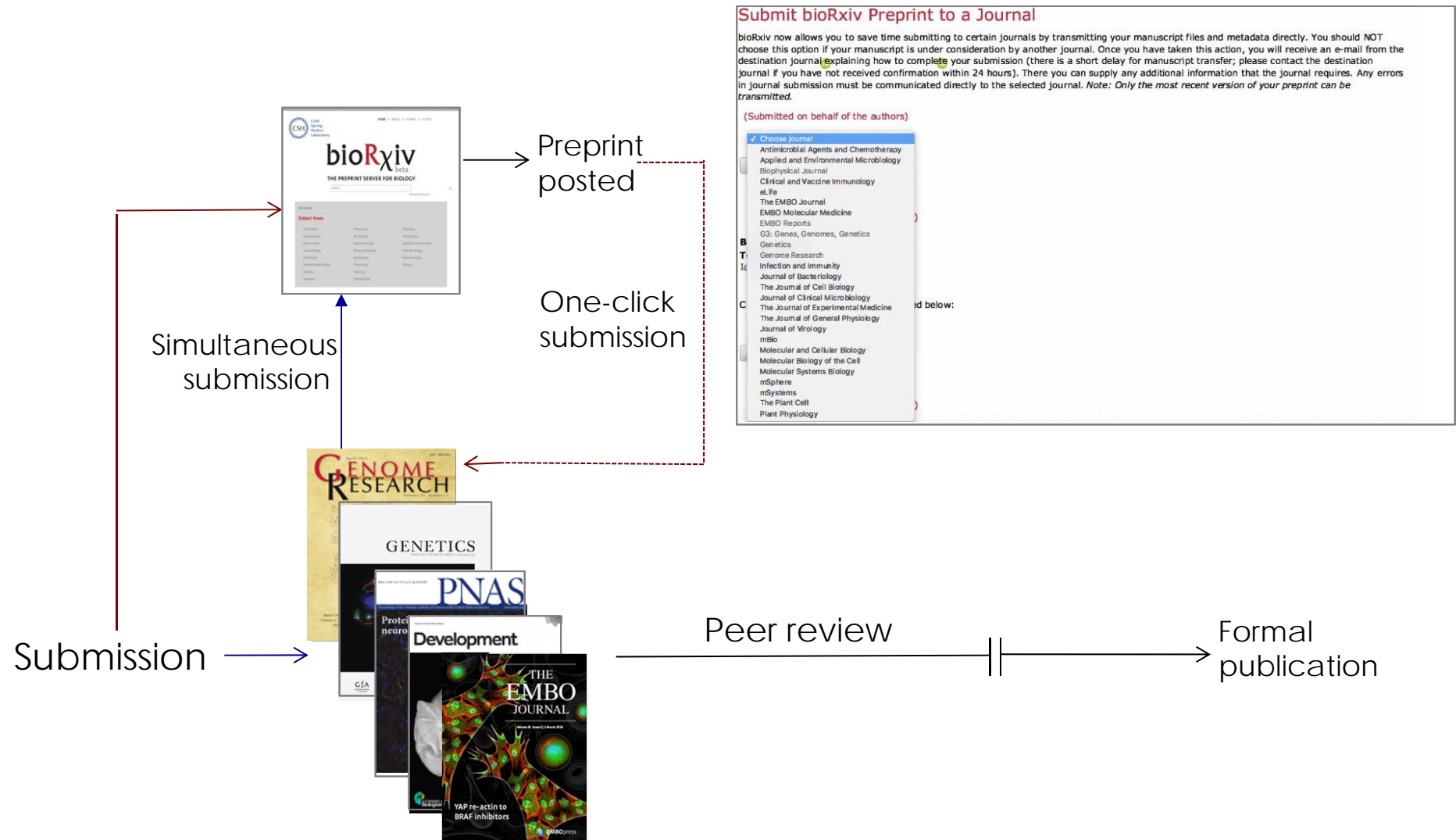
Preprint Search

powered by 

Search

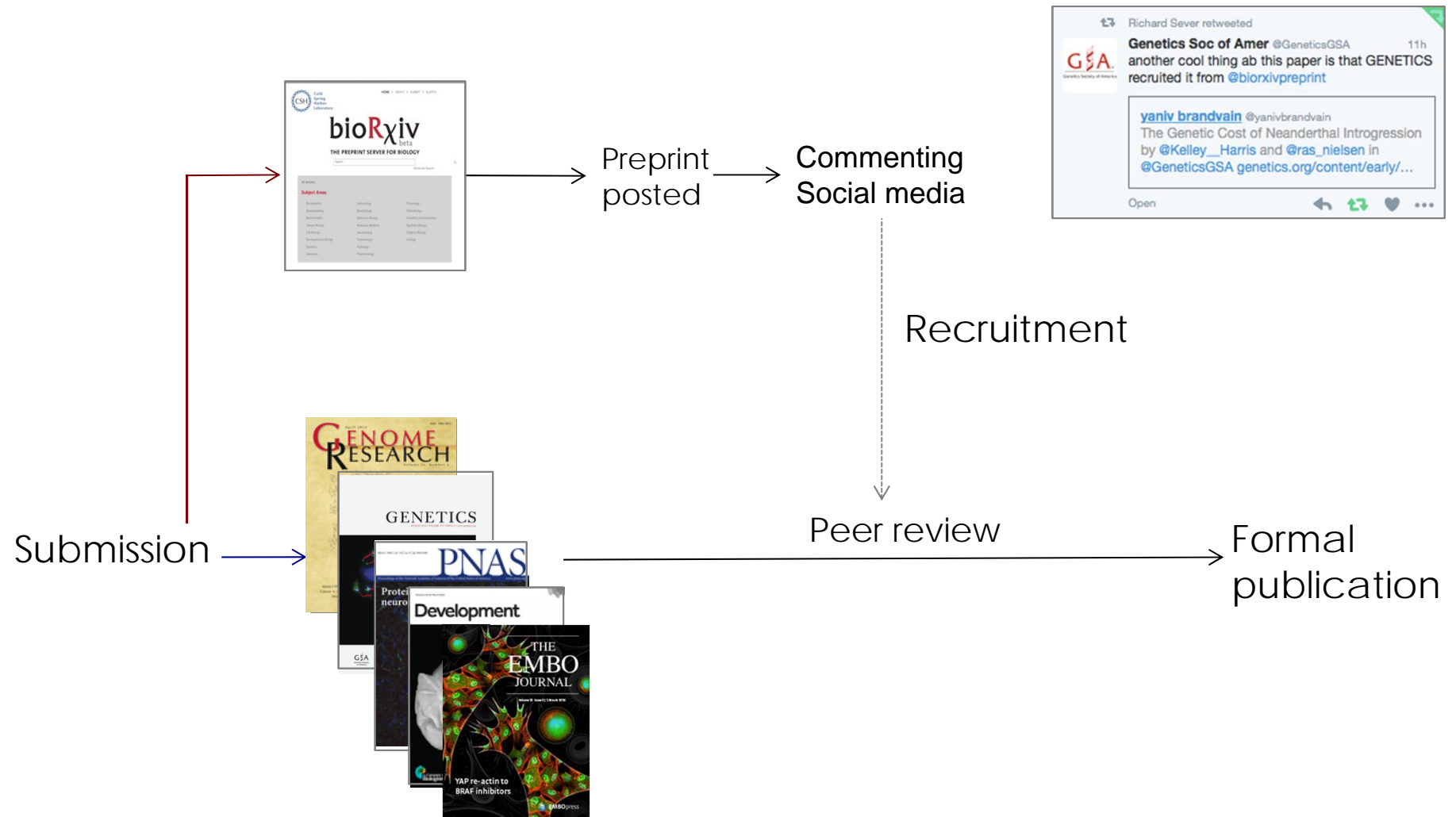


## Integration with journals





## Further integration





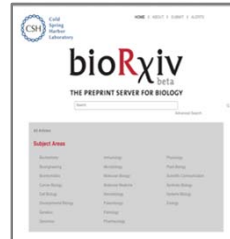
## bioRxiv as a communication hub



*Reproducibility*

Confirmatory results ←

Contradictory results ←



→ Journals

*Certification*

Meetings    Blogs

*Discussion*



## In summary: preprint progress

- Behavior change: ever more biologists posting/reading preprints
- Policy change: majority of journals allow preprint posting
- Rule change: NIH biosketch
- Change in community awareness: ASAPbio
- Institutional change: preprint consideration in hiring/promotion decisions
- Reduction in preprint anxiety



## Priorities for bioRxiv

- Expanding journal integration
- Adding services for authors
- Developing APIs for third party services
- Evolving governance
- Continuing advocacy for preprints
- Considering best-of-breed technology solutions
- Working with funders to establish requirements and financing



## What can funders do?

- Adopt clear policies on preprints
- Encourage grantees to post preprints of their papers and respond to community feedback
- Encourage grant review committees to consider preprints as evidence of productivity, especially by early-career scientists
- Facilitate coordination among not-for-profit preprint services across academic disciplines
- Financially support not-for-profit preprint services to maximize their benefits to science



## Acknowledgements

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Partner Publishers

Partner Submission Systems



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The Lourie Foundation



Thank you!

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