Preprints and publishing – ‘It’s good for you and it's good for science’

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Director of Strategic Initiatives & Community
04-07-2022
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ASAPbio

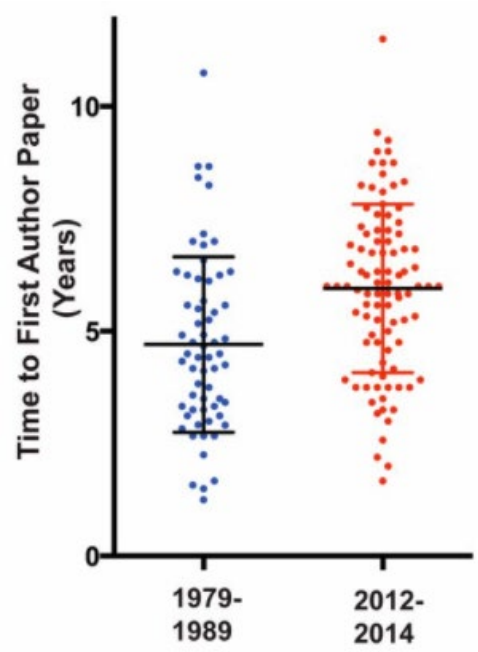
Let’s talk #preprints….

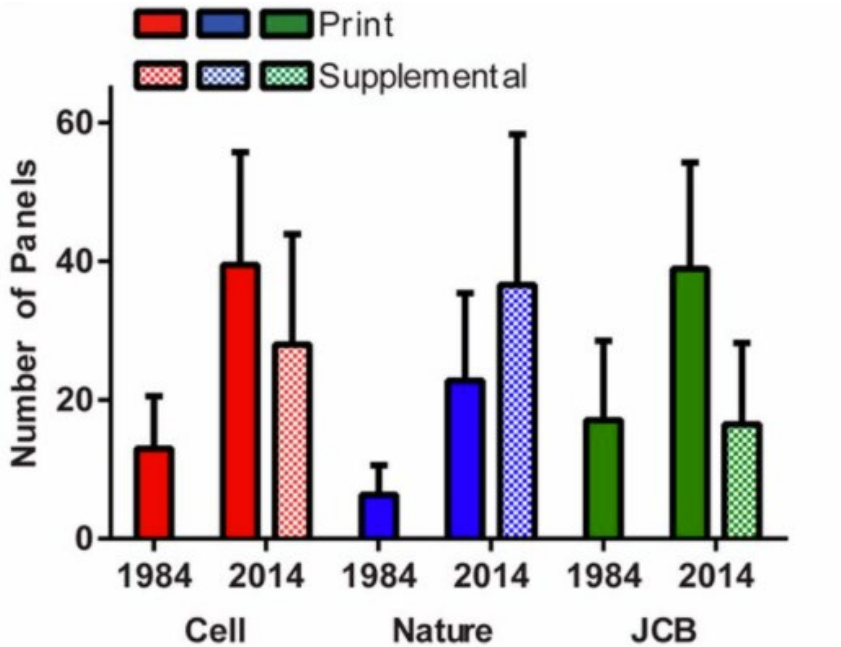
- An introduction to preprints
  - What is a preprint?
  - Preprints & open science
- The landscape & current trends in the life sciences
- Possible questions around posting preprints
- How to have the best experience posting a preprint

ASAPbio is a biologist-driven non-profit working to make life sciences communication faster and more transparent

We support a productive use of preprints in the life sciences

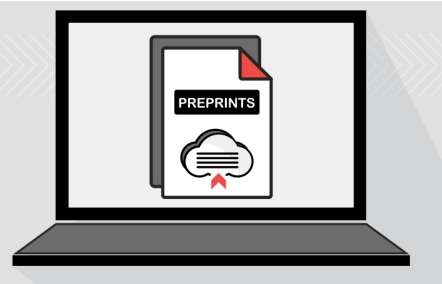
Creating a publishable unit is slower than ever





Accelerating scientific publication in biology
Ronald D. Vale. Proceedings of the National Academy of Sciences Nov 2015, 112 (44) 13439-13446
DOI: 10.1073/pnas.1511912112

What is a preprint?



A scholarly manuscript posted by the author(s) to a repository or platform to facilitate open and broad sharing of early work without any limitations to access

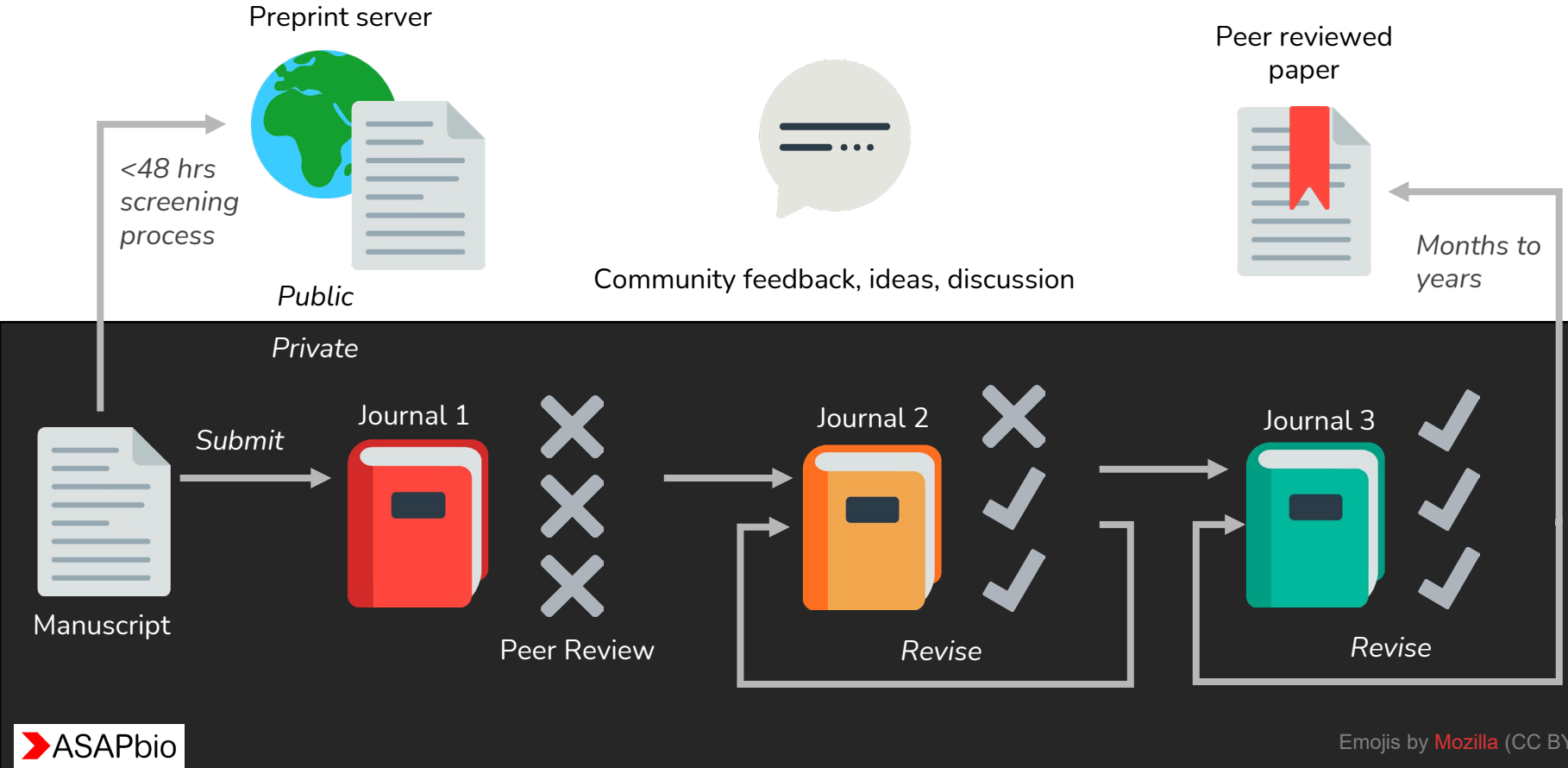
*"We sometimes refer to this as the **'directors' cut'**, knowing that if the manuscript is submitted to a journal, it may undergo all kinds of change [...] after the process of peer review."*

John Inglis, founder of bioRxiv & medRxiv

Similarities & differences with journal articles

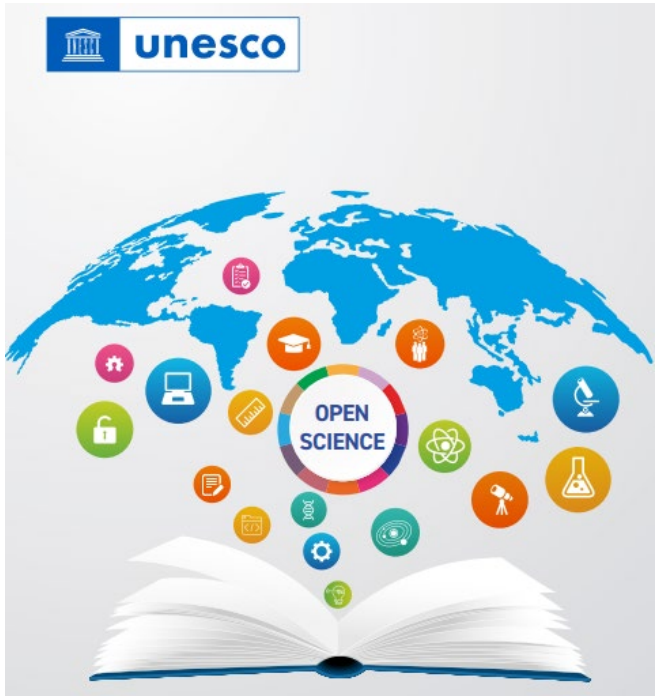
Preprints = Journal articles	Preprints ≠ Journal articles
• Report scholarly work • Receive a DOI (or persistent identifier) • Can be cited	 • Not peer reviewed by server prior to posting  • Allows versioning  • Easier corrections & updates

Preprints allow prompt dissemination of research work



Preprints & open science

Preprints are a tool for open science



UNESCO recommendations for open science

(vi) Promoting innovative approaches for open science at different stages of the scientific process

Promoting open science from the outset of the research process and extending the principles of openness in ***all stages of the scientific process to improve quality and reproducibility, including the encouragement of community-driven collaboration and other innovative models, for example preprints****, clearly distinguished from final peer-reviewed publications, and respecting the diversity of scientific practices, in order to accelerate dissemination and encourage rapid growth in scientific knowledge.*

en.unesco.org/science-sustainable-future/open-science/recommendation

Preprints are a tool for open science

Speed of dissemination
Preprints make scientific work available in a matter of days, at any stage of the research process

UNESCO recommendation #6 Promote innovative approaches for open science at different stages of the scientific process

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Broad access
Preprints are free to post and free to access -no publication fee, no subscription fee or paywall

UNESCO recommendation #1 Promote a common understanding of open science, benefits & challenges, diverse paths to open science

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Open outputs
Preprints allow sharing of associated data & materials earlier, opportunities to engage in open review

UNESCO recommendation #5 Foster a culture of open science & align incentives for open science

Preprints are a tool for open science

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Open outputs
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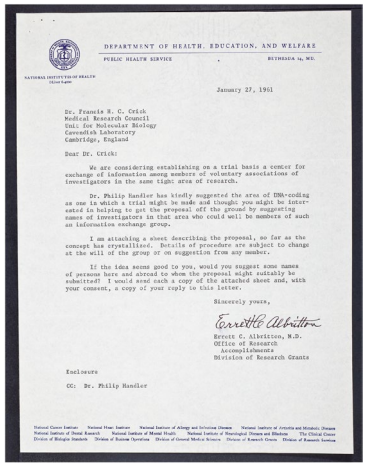
UNESCO recommendation #5 Foster a culture of open science & align incentives for open science

Feedback & collaborations
Opportunities for interactions & collaborations among researchers

UNESCO recommendation #7 Promote international & multi-stakeholder cooperation in open science

Preprints in the life sciences

Preprints have been in use for a while, but not in the life sciences



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

January 27, 1961

Dr. Francis H. C. Crick
Medical Research Council
Unit for Molecular Biology
Cavendish Laboratory
Cambridge, England

Dear Dr. Crick:

We are considering establishing on a trial basis a center for exchange of information among members of voluntary associations of investigators in the same tight area of research.

Dr. Philip Handler has kindly suggested the area of DNA-coding as one in which a trial might be made and thought you might be interested in helping to get the proposal off the ground by suggesting names of investigators in that area who could well be members of such an information exchange group.

I am attaching a sheet describing the proposal, so far as the concept has crystallized. Details of procedure are subject to change at the will of the group or on suggestion from any member.

If the idea seems good to you, would you suggest some names of persons here and abroad to whom the proposal might suitably be submitted? I would send each a copy of the attached sheet and, with your consent, a copy of your reply to this letter.

Sincerely yours,

Everette Albritton

Everett C. Albritton, M.D.
Office of Research
Accomplishments
Division of Research Grants

Enclosure

CC: Dr. Philip Handler

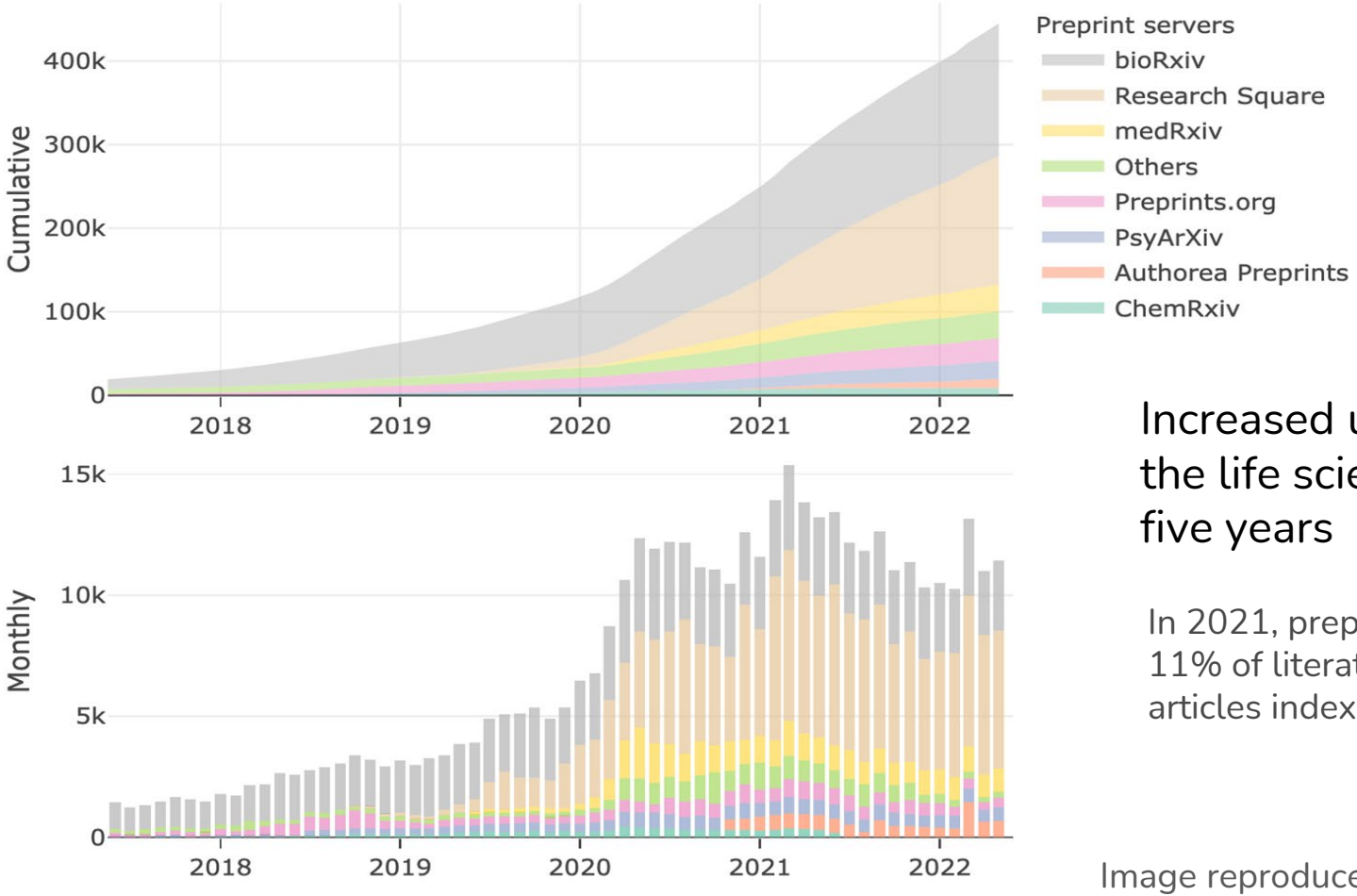
Credit: Cold Spring Harbor Laboratory Archive.
Cobb M (2017) The prehistory of biology preprints: A forgotten experiment from the 1960s. PLoS Biol 15(11): e2003995.

Early experiment by NIH via the **Information Exchange Groups**

- Operated from 1961 to 1967
- Closed due to costs and resistance by journals

Communities in physics continued experiments for the early sharing of manuscripts drafts and the **preprint server arXiv** was founded in 1991

- Covers physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering & systems science, economics
- Hosts over 2,000,000 preprints

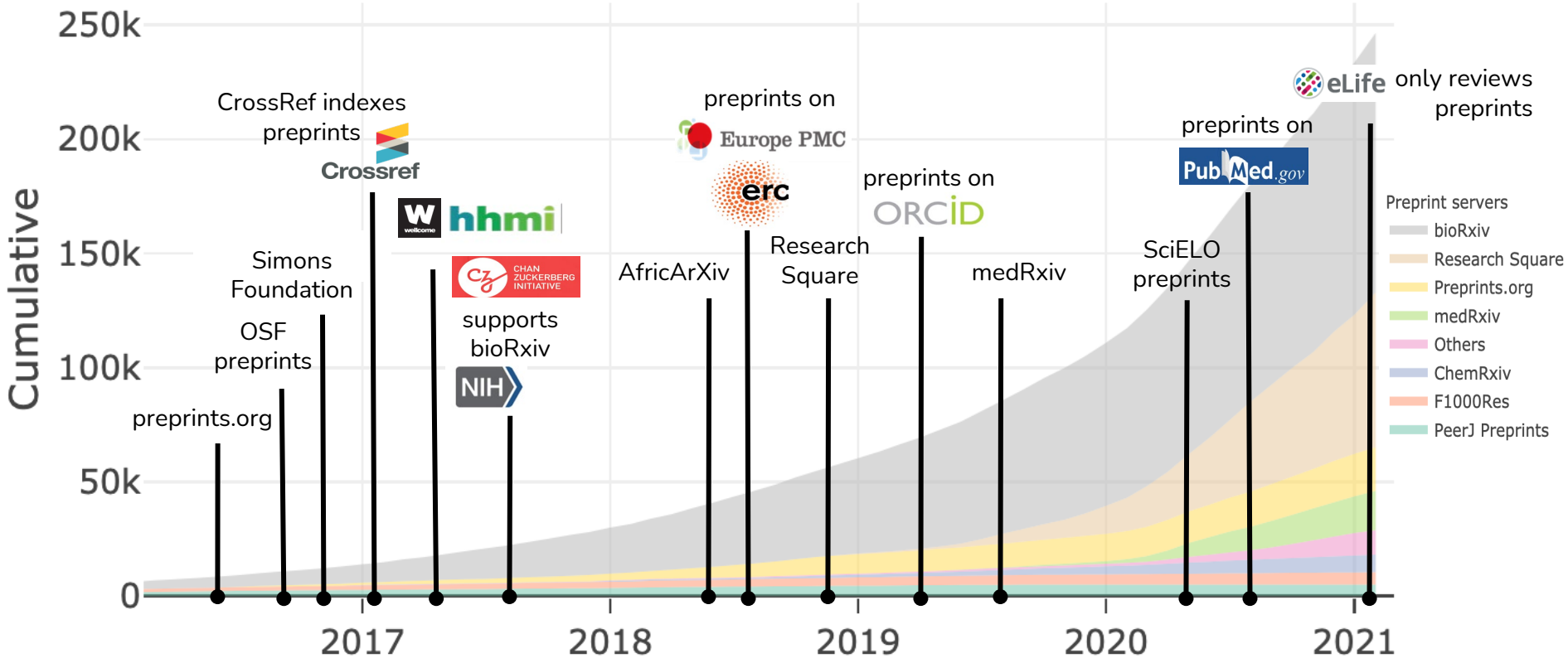


Increased use of preprints in the life sciences over the last five years

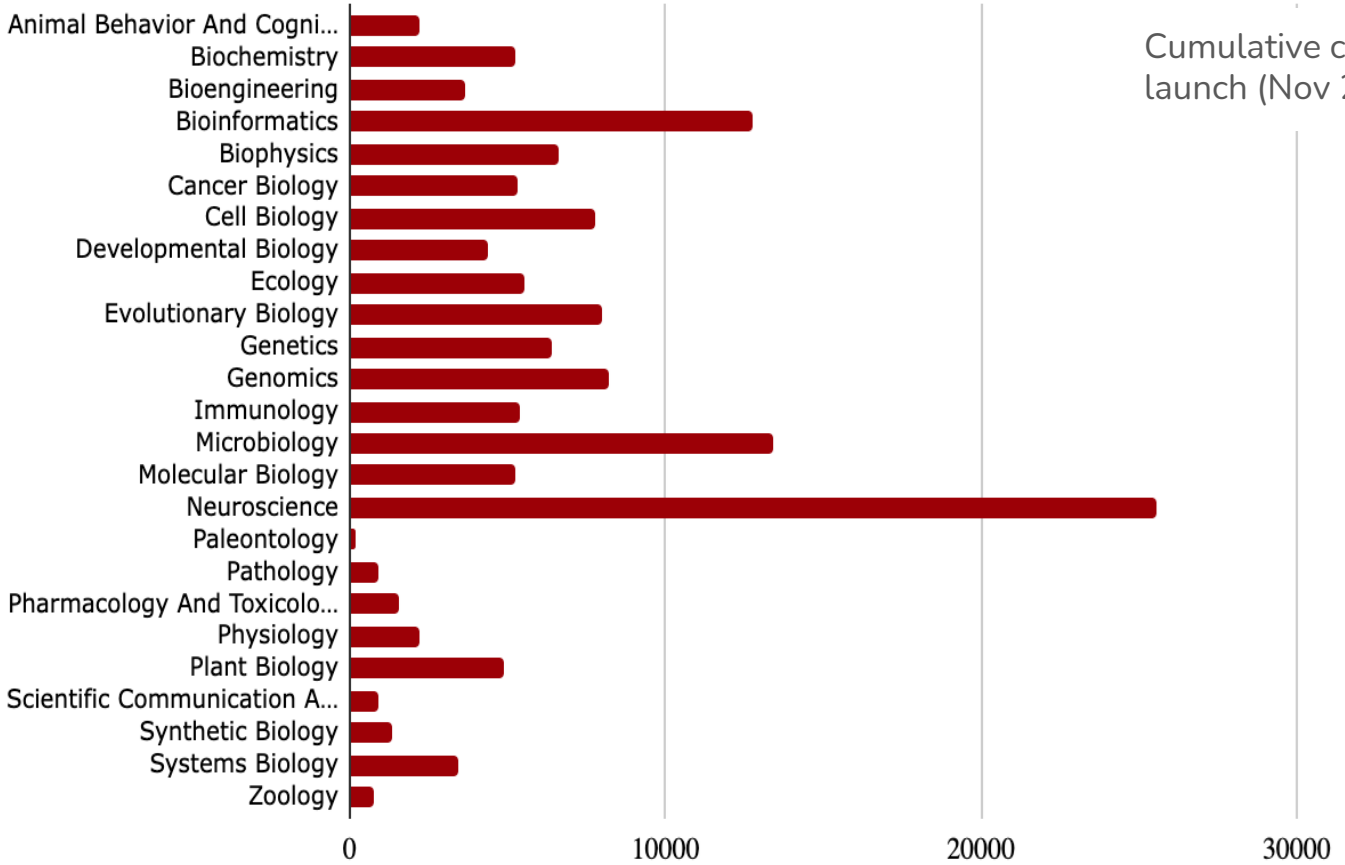
In 2021, preprints so far constitute 11% of literature vs research articles indexed in Europe PMC

Image reproduced from Europe PMC: https://europepmc.org/Preprints

Preprints in the life sciences

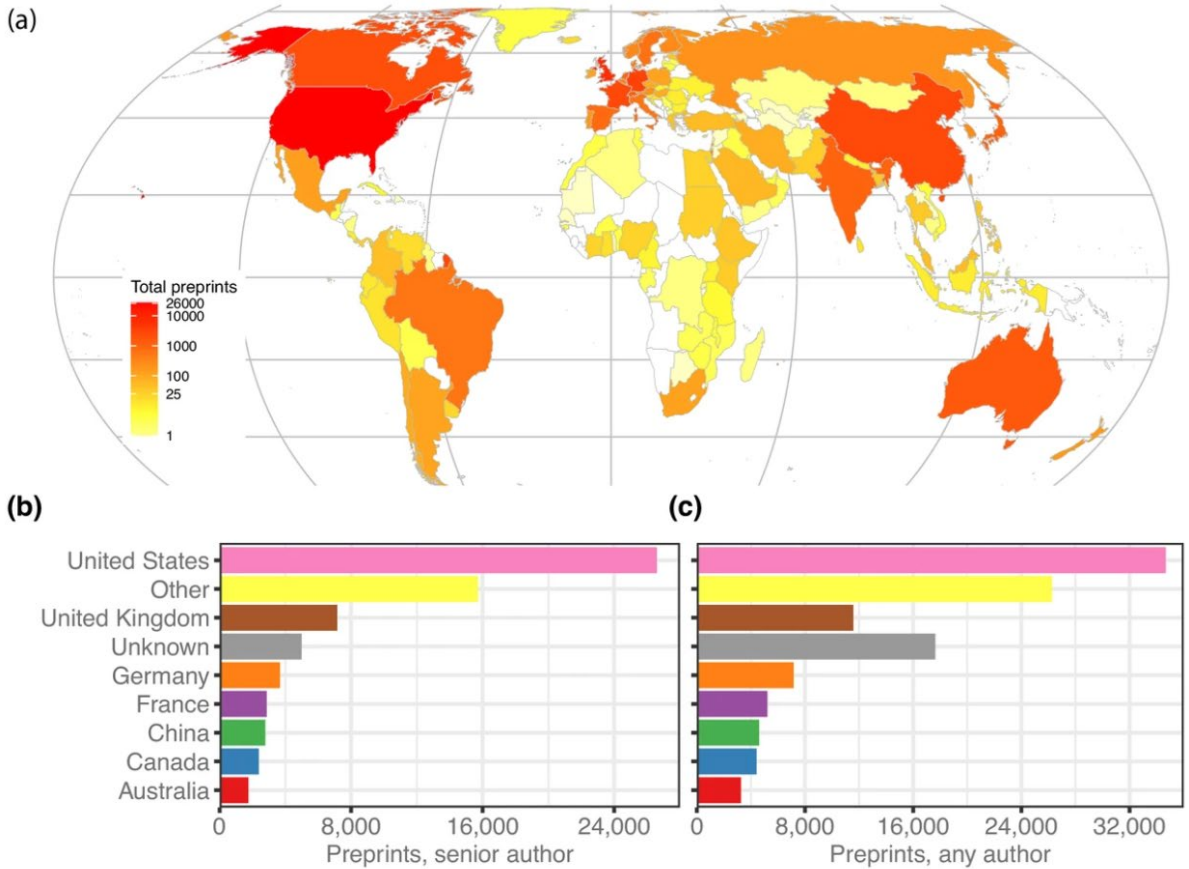


Preprint use varies per discipline



Cumulative content in bioRxiv - from launch (Nov 2013) until end of 2021

Preprint use varies per country



(a) Distribution of bioRxiv preprints per country, based on affiliation of corresponding author

(b) Preprints attributed to the seven most prolific countries

Richard J. Abdill, Elizabeth M. Adamowicz, Ran Blekhman. eLife 2020;9:e58496

Puebla

Most journals in biomedical sciences accept preprints

- SHERPA/RoMEO lists over 1,200 publishers with policies that accept preprints
- **TRANSPOSE database** (https://transpose-publishing.github.io/#/) provides information on preprint policies at journals
- Wikipedia page ‘List of academic publishers by preprint policy’

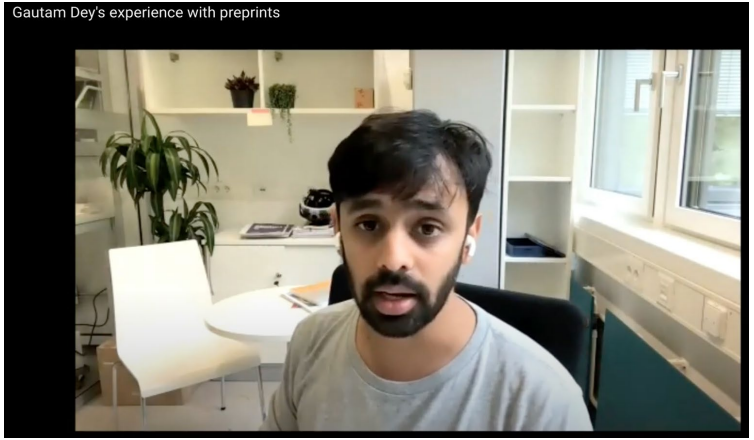
Preprints provide proof of productivity

A number of funders encourage preprints as evidence of productivity in grant applications and reports: asapbio.org/funder-policies

'I can endorse 100% the value of preprinting for early career researchers, because without this way to showcase my work I would not have been able to convince search committees to give me a chance to present my ideas'

Gautam Dey

Group Leader, EMBL



www.youtube.com/watch?v=Qx4-x_WvaIQ

Preprints provide proof of productivity

EMBO Postdoctoral Fellowships

EMBO will consider primary research papers published on preprint servers (ArXiv, BioRxiv, MedRxiv, etc), but **a first-author publication in an international peer-reviewed journal is still a requirement**. Similarly, reviews, comments and patents can be listed where appropriate, but are not considered primary research publications.

Publications

Applicants must have at least one first (or joint first) author primary research paper accepted for publication or published in an international peer reviewed journal at the time the application is complete.

The following items should not be listed as publications:

- Papers submitted or in preparation not yet accessible to the community.
- Papers published not in English originally.
- Abstracts of presentations at conferences.

Preprints provide proof of productivity

'Applicants must have at least one first (or joint first) author primary research paper accepted for publication or published in an international peer reviewed journal at the time the application is submitted.

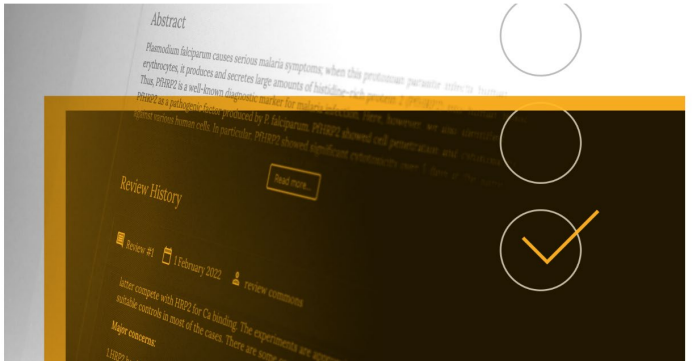
New as of 25 April 2022: A first author ***preprint with in-depth peer reviews publicly available from a trusted independent preprint peer review platform is also sufficient for eligibility****.'*

FEATURES

Refereed preprints recognized as eligibility criterion for EMBO Postdoctoral Fellowships

EMBO will accept first author refereed preprints in applications for postdoctoral fellowships in a four-month trial

By EMBO Communications

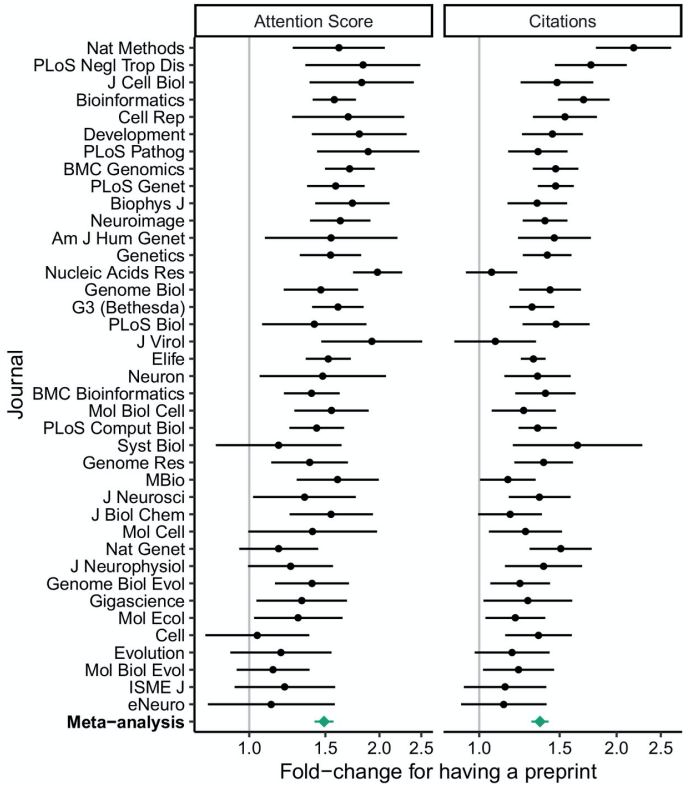


Preprints maximize the reach of your work

Preprints allow you to receive citations for your work earlier

Journal articles with a prior associated preprint receive more attention and citations

A study on bioRxiv preprints reported that articles with a preprint received **36% more citations** than articles without a preprint



Fu and Hughey. eLife 2019;8:e52646. DOI: https://doi.org/10.7554/eLife.52646

What about scooping?

Concerns about scooping

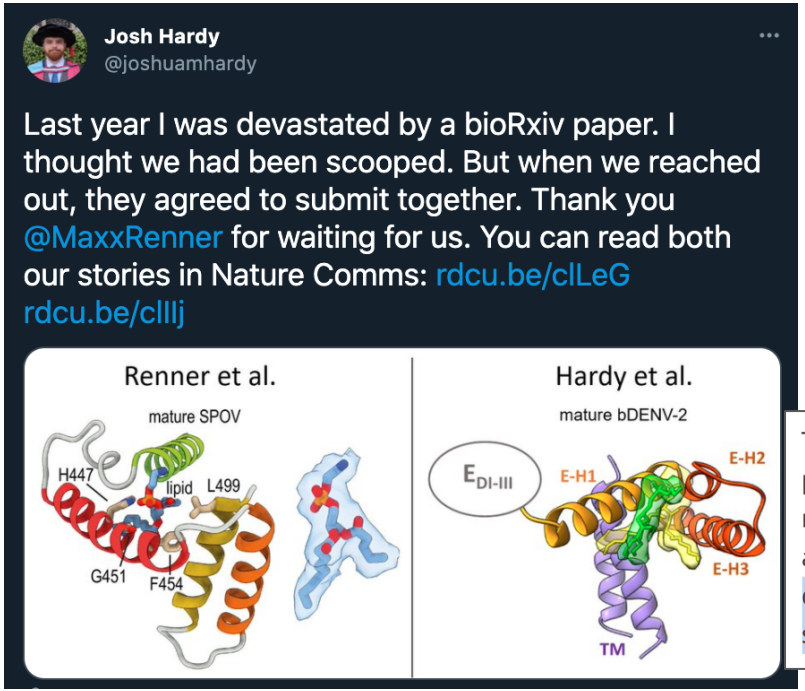
Has posting a preprint negatively affected you in any of the following ways	% of respondents
No	89.6
Limited your choice of journal for publication	6.43
Prevented you from publishing in your journal of choice because another lab published before you	0.70
Affected your priority claim to the research	1.25
Other	4.41

bioRxiv survey N=3127
'bioRxiv: the preprint server for biology'
https://doi.org/10.1101/833400

Preprints provide a date-stamped permanent record of your work - There is no evidence that preprints increase risk for scooping

A number of journals operate scooping protection policies: EMBO, *eLife*, PLOS journals

Preprints can turn potential scooping into collaborations



Fear of being scooped is fuelling the replication crisis in research

Back-to-back publication reinforces findings, and preprints could facilitate it. So why are journals still so wary of it, asks Josh Hardy

July 8, 2021

Josh Hardy

It was the nightmare moment that every junior scientist dreads: having found the result you have been searching for throughout your PhD, you learn that someone from another laboratory has the same finding and is about to publish.

Traditionally, conferences are where unpublished work is discussed, and conference presentations can predate publication by several months. But conference audiences are necessarily restricted – and the fear of being scooped can be a disincentive to present anything that isn't already in press. Preprint servers provide a new means for sharing and discovering research before it is published – and, potentially, for coordinating submission.

https://www.timeshighereducation.com/opinion/fear-being-scooped-fuelling-replication-crisis-research

And sharing information before peer review?

Public reviews place preprints in context

Review COMMONS

eLife

Cold Spring Harbor Laboratory

bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

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Search

bioRxiv is receiving many new papers on coronavirus SARS-CoV-2. A reminder: these are preliminary reports that have not been peer-rev
practice/health-related behavior, or be reported in news media as established information.

New Results

Comment on this paper

Activation of innate immune signalling during development predisposes to inflammatory intestine and shortened lifespan

Kyoko Yamashita, Ayano Oi, Hina Kosakamoto, Toshitaka Yamauchi, Hibiki Kadoguchi, Takayuki Kuraishi, Masayuki Miura, Fumiaki Obata

doi: https://doi.org/10.1101/2021.04.12.439419

This article is a preprint and has not been certified by peer review [what does this mean?].

Abstract | Full Text | Info/History | Metrics | Preview PDF

Abstract

Early-life inflammatory response is associated with risks of age-related pathologies. How transient immune signalling activity during animal development influences life-long fitness is not well understood. Using *Drosophila* as a model, we find that activation of innate immune pathway IMD signalling in the developing larvae increases adult starvation resistance, decreases food intake, and shortens organismal lifespan. Interestingly, lifespan is shortened by the IMD activation in the larval gut and fat body, while starvation resistance and food intake are altered by that in neurons. The adult flies developed with IMD activation show sustained IMD activity in the gut, despite complete tissue renewal during metamorphosis. The inflammatory adult gut is associated with a greater amount of *Gluconobacter* sp., characteristic gut microbiota increased in response to immune activation. Removing gut microbiota by antibiotics attenuates the increase of IMD activity and rescues the shortened lifespan. This study demonstrates a tissue-specific programming effect of early-life immune activation on the adult

Review Commons

Annotations | Page Notes 5

EMBOpress 15 Apr
Review Commons

Note: This preprint has been reviewed by subject experts for *Review Commons*. Content has not been altered except for formatting.

Learn more at Review Commons

Referee #1

Evidence, reproducibility and clarity

This paper shows that transient genetic induction of the IMD innate immune pathway during Drosophila development, has long term effects on adult health and lifespan. The paper is well-written, the experiments are well designed and executed, and the data are without exception good quality. The data also support the specific conclusions well. The experiments take full advantage of the Drosophila system to pinpoint the effect on lifespan to long term activation of inflammation in the gut, which is interlinked and dependent upon changes in the microbiota. However the analysis is not comprehensive, because neural-specific effects on starvation resistance are not followed up, and because the etiology of the changes in microbiota is not mapped out. I should also say that I do not fully agree with the conclusion in the last sentence of the

More

PeerReviewed

EMBOpress 15 Apr
Review Commons

Note: This preprint has been reviewed by subject experts for *Review Commons*. Content has not been altered except for formatting.

Learn more at Review Commons

Referee #2

Evidence, reproducibility and clarity

Community commenting and review of preprints

PREREVIEW

Bioorthogonal labeling of transmembrane proteins with non-canonical amino acids allows access to masked epitopes in live neurons

Diogo Bessa-Neto[1*], Alexander Kuhlemann[2*], Gerti Beliu[2*], Valeria Pecoraro[1], Sören Doose[2], Natacha Retailleau[1], Nicolas Chevrier[1], David Perrais[1], Markus Saue

[1]Univ. Bordeaux, CNRS, Interdiscip
33000 Bordeaux, France.
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Hubland, 97074 Würzburg, Germa
[3]Univ. Bordeaux, CNRS, INSERM,
33000 Bordeaux, France.
*These authors contributed equally
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bordeaux.fr)

ABSTRACT

Progress in biological imaging is in
explosion in the development of hig
approaches to label targets with sn
localization of the target within the im
and allow access to any epitope of th
report here the development of a co
expansion and non-canonical amino
masked epitopes in target transmembr
organotypic brain slices. This allowed
receptor auxiliary proteins in comple
widefield, confocal, and *d*STORM supe

Milka Kostic's review 4/8/2021

DOI 10.5281/zenodo.4672026

Dear authors,

thank you for sharing this preprint with everyone. I recently decided to support research in chemical biology by providing feedback and thoughts on preprints in this field. Your preprint caught my eye, and I hope you will find the comments below useful (I hesitate to call this peer review, but if you would like to share what I wrote with a journal please feel free).

Kind regards,

Milka

Comments to authors:

In this preprint the authors combine genetic code expansion (a strategy that allows one to incorporate non-canonical amino acids at a specific position within the protein), with biorthogonal labeling (a type of chemical reaction executed in living systems in a way that is orthogonal to biological/physiological reactions) and optical microscopy to visualize two members of the transmembrane AMPA receptor (AMPAR) regulatory protein (TARP) family, γ2 and γ8 in live neurons and brain slices.

The main problem that the authors set out to address is as follows:

- The authors present evidence that antibodies can't recognize endogenous TARP gamma2 and gamma8 in neurons because these proteins are found to be associated with AMPAR's ligand binding domain (LBD) in a manner that masks the epitope. This suggests that strategies like immunostaining using fluorescently labeled antibodies are not appropriate for TARP imaging. Therefore, to solve this problem the authors decided to pursue a completely different strategy that does not rely on antibody use. Overall, this is an important research problem and the approach the authors chose to pursue is appropriate for addressing this problem.

Summary of the approach:

- The authors incorporated clickable trans-cyclooctene derivatized lysine into TARP gamma2 and gamma8 using established strategy for genetic code expansion. Exposing the modified TARP gamma2 and gamma8 to cell-impermeable tetrazine-dyes resulted in biorthogonal reaction called strain-promoted inverse electron-demand Diels-Alder cycloaddition reaction (SPIEDAC), whereby TARP gamma2 (or gamma8) featuring a modified lysine is covalently labeled with the fluorescent dye. The strategy does not seem to prevent TARP gamma2 and gamma8 from interacting with AMPARs, or affect TARP gamma2 and gamma8 function making this a well-tolerated modification. Additionally, the fluorescent signal is strong enough to allow visualization in primary neurons, as well as organotypic hippocampal slice cultures.

2019 Novel Coronavirus Research Compendium (NCRC)

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

Topics Who v

Vaccines

Evidence for increased breakthrough rates of SARS-CoV-2 variants of concern in BNT162b2 mRNA vaccinated individuals

9 APR 2021 – medRxiv, Kustin et al.

Our take –

In a matched pair case-control study, available as a preprint and thus not yet peer-reviewed, comparing breakthrough cases in 247 partially and 149 fully immunized adults with BNT162b2 vaccine to unvaccinated controls in Israel, the odds of COVID-19 infection by the B.1.1.7 variant versus the wild-type were twice as high among partially immunized adults compared to unvaccinated controls but there was no difference between fully vaccinated cases and unvaccinated controls. All 8 B.1.351 variant infections in the fully immunized group were detected prior to the 14-day threshold for optimal immune protection by BNT162b2 vaccination. Observed associations are not measures of vaccine effectiveness, as study inclusion was restricted to individuals with confirmed COVID-19 infections.

Rapid Reviews COVID-19

RR:C19

Medical Sciences Published on Apr 13, 2021 DOI 10.1162/2e3983f5.b15d3240

Reviews of "A Prothrombotic Thrombocytopenic Disorder Resembling Heparin-Induced Thrombocytopenia Following Coronavirus-19 Vaccination"

Reviewers: Vittorio Pengo (University of Padova) | • John Swartzberg (UC Berkeley) |

by Vittorio Pengo and John Swartzberg

last released 1 week ago

This Pub is a **Review** of

A Prothrombotic Thrombocytopenic Disorder Resembling Heparin-Induced Thrombocytopenia Following Coronavirus-19 Vaccination

by Andreas Greinacher, Thomas Thiele, Theodore E. Warkentin, Karin Weisser, Paul Kyrle, and Sabine Eichinger

Show Description · dx.doi.org

To read the original manuscript, click the link above.

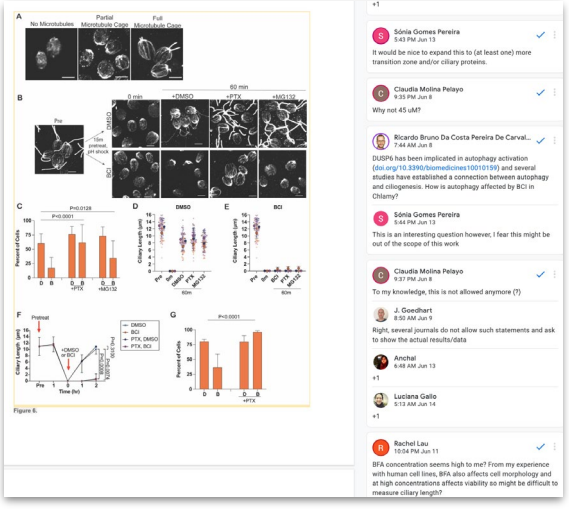
Summary of Reviews: *This paper describes 9 patients who developed clotting events after administration of the ChAdOx1 vaccine. Both reviewers suggest that this mechanism is plausible, informative, and similar to a rare, but well-understood, complication called heparin-induced thrombocytopenia.*

Reviewer 1 (Vittorio Pengo) |

Reviewer 2 (John Swartzberg) |

ASAPbio crowd preprint review

Encourage collaborative preprint reviews and participation by early-career researchers



Preprint selection per week

Dozens of reviewers invited to discuss preprint via GDoc for 14 days

Reviewer synthesizes comments into a single review that is posted publicly

Learn more & sign up as a reviewer: asapbio.org/become-a-crowd-preprint-reviewer

5-steps to having the best experience posting a preprint

1.Get all authors on board

Questions? Resources available at the **ASAPbio Preprint resource center**: asapbio.org/preprint-info

- Preprint infographics
- Preprint FAQ: asapbio.org/preprint-info/preprint-faq
- Funder, journal, institutional policies

2. Choose a preprint server

There are are a number of preprint servers for experimental biology - the **ASAPbio Preprint Server Directory** catalogues preprint server characteristics: asapbio.org/preprint-servers

Consider visibility, funder recommendations, and features like preservation or indexing

agriRxiv

bioRxiv
THE PREPRINT SERVER FOR BIOLOGY

Research Square

SciELO Preprints

Preprints

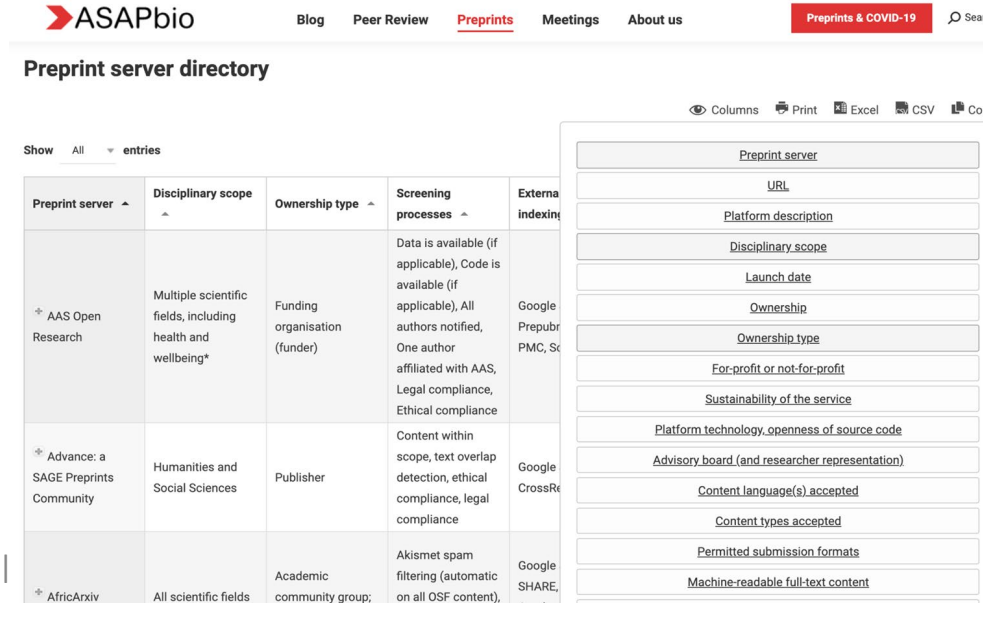
AfricArXiv

RINarxiv
The Preprint Server of Indonesia

AUTHOREA

JMIR Preprints

OSF PREPRINTS

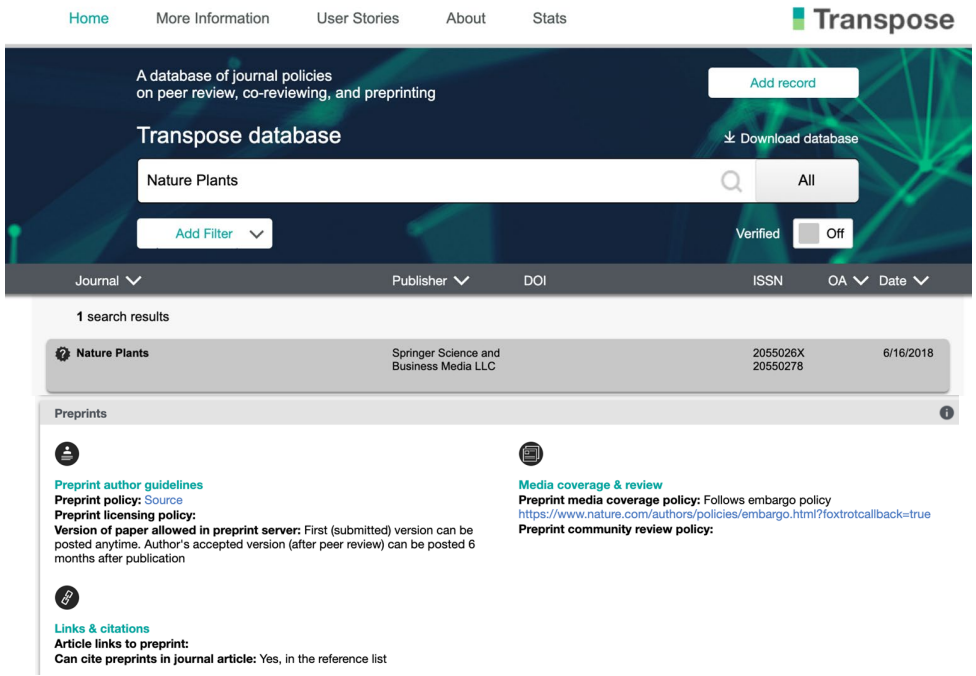


3. Check journal policies

A large majority of journals in biology accept preprints

Double check journal policies on when and where preprints may be posted

- Sherpa Romeo: sherpa.ac.uk/romeo/search.php
- TRANSPOSE database: https://transpose-publishing.github.io/#/



Examples of preprint policies at journals

nature portfolio
CellPress

Preprints

Nature Portfolio journals encourage posting of preprints of primary research manuscripts on preprint servers, authors' or institutional websites, and open communications between researchers whether on community preprint servers or preprint commenting platforms.

the life sciences. *Science* **352**, 899–901; 2016); preprints may be posted at any time during the peer review process. Posting of preprints is not considered prior publication and will not jeopardize consideration at Nature Portfolio journals. Manuscripts posted on

CellPress

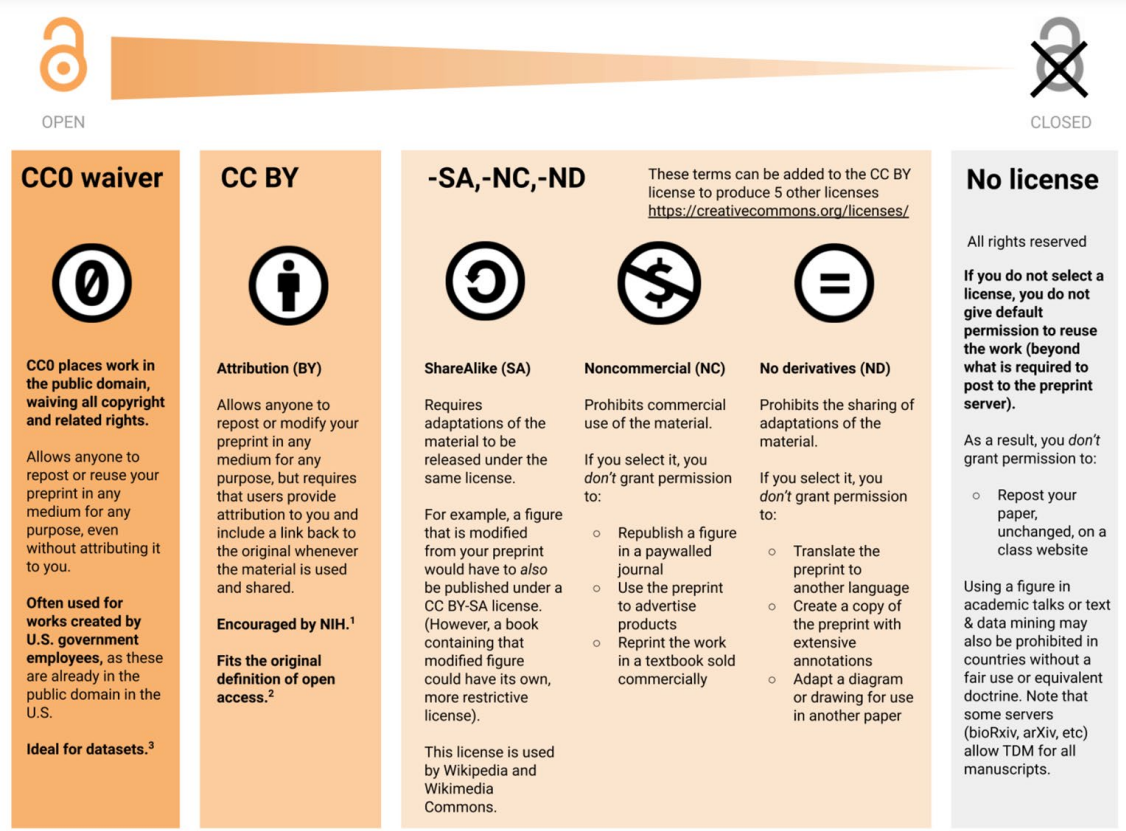
Manuscripts are considered with the understanding that no part of the work has been published previously in print or electronic format and the paper is not under consideration by another publication or electronic medium. If you have questions about whether posting a manuscript that you plan to submit to a Trends journal on an openly available preprint server would affect consideration, we encourage you to contact the editor so that we may provide more specific guidance. In many cases, posting will be possible. We do not support posting of revised manuscripts, in response to editorial or reviewer feedback, or the final published version.

eLife

Effective July 1, 2021, eLife only reviews research papers that have been posted as a preprint (ideally on bioRxiv or medRxiv). Note: authors do not need to have posted a preprint for the initial submission/evaluation stage, but they do need to have posted a preprint for the full submission/peer review stage. eLife will post manuscripts to bioRxiv or medRxiv on behalf of the authors during the full submission process if required.

4. Choose a license

- ASAPbio licensing FAQ: asapbio.org/licensing-faq
- If filing a patent application related to the work, consult with your technology transfer office before preprinting.

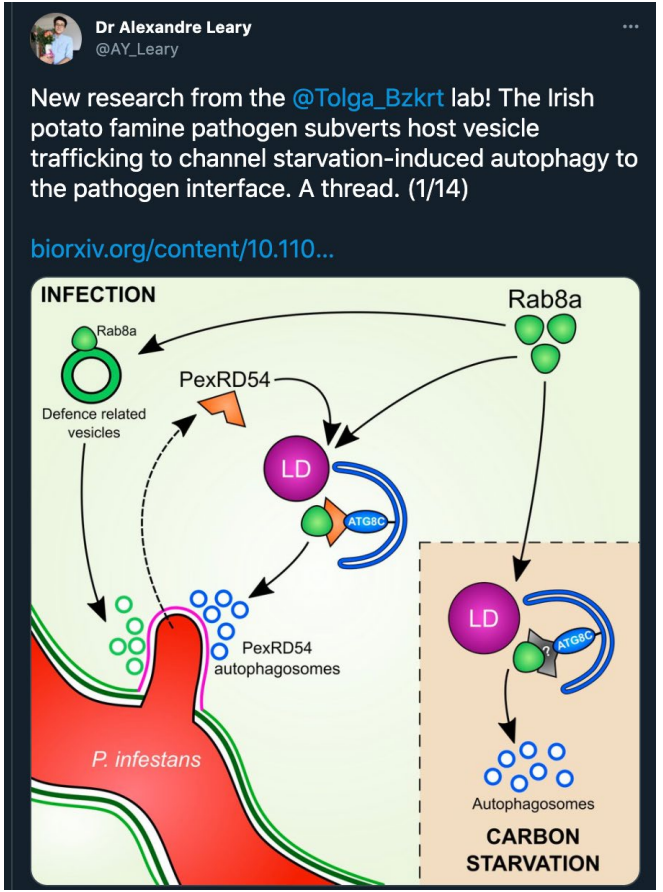


5. Prepare your preprint and post!

Link any data, code or other resources to your preprint

Depending on the process at the server the manuscript will be available immediately upon submission, or within a few days

Share and invite feedback via social media or email!



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'Preprints are the best thing that has happened to scientific publishing in over a century. More than anything, they have brought back the joy of publishing a paper'.

Yasin Dagdas
Group Leader, Gregor Mendel Institute of Molecular Plant Biology