

# Disclosures

- Advisory Board Member, *European Molecular Biology Organization (EMBO) Press*
- Advisory Board Member, *British Medical Journal BMJ Open Science*
- Section Editor, *PLOS Biology*
- Consulting Editor, *Journal of Cerebral Blood Flow & Metabolism* (SAGE Journals)
- Scientific Secretary, Einstein Foundation Award for Promoting Research Quality (Partner: *Nature*)

# Scientific publishing in the life sciences: The dawn of a new era?

Munich (virtual) 26.3.2021

Slide download: <http://>





The need for reform  
(,We have a problem‘)



New modes of publishing



A few best practice examples

[Houston] We have a problem...



## „Fun facts“

- Medline alone: 2.5 million articles per year (no preprints)
- 8 major publishers control 2/3rd of market
- 60 billion € per year
- Elsevier (2016): sales 3 billion €, profit 1.2 billion € (40 % profit rate)
- German University libraries pay 100 Mio € per year for subscriptions, 50 % of which go to Elsevier, SpringerNature, Wiley (7.6 billion € world wide)
- 50.000 journals (32% OA licencing model)
- 28 % of the scientific literature is not behind paywalls (Medicine: 60%, Chemistry 15%)

Source: [https://www.laborjournal.de/rubric/hintergrund/hg/hg\\_21\\_03\\_02.php](https://www.laborjournal.de/rubric/hintergrund/hg/hg_21_03_02.php)

## A tsunami of research outputs



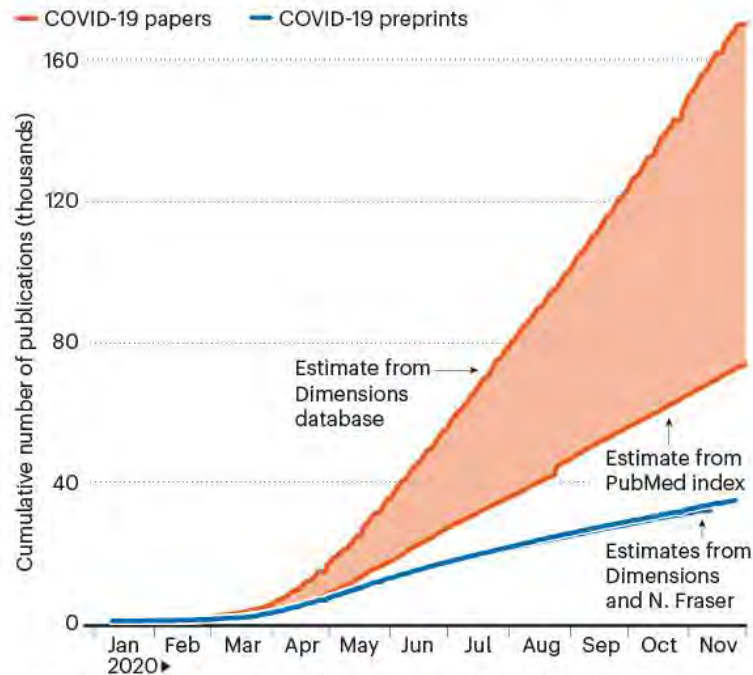
Approximately 100,000 COVID related articles in Pubmed since 1/2020

Around 4% of the world's research output was devoted to the coronavirus in 2020

(<https://www.nature.com/articles/d41586-020-03564-y>)

### CORONAVIRUS CASCADE

One estimate suggests that more than 200,000 coronavirus-related journal articles and preprints had been published by early December.



\*Estimates differ depending on search terms, database coverage, and definitions of what counts as a scientific article; some preprints were posted on multiple sites online.

@nature

Free access to publicly funded research results for everyone is an ethical mandate (,Open Access')





But: ‚Open Access‘ is a business model of the publishers.  
They want to not only keep their profit rate in the 10-40%  
range, but to potentially increase it in the future.





# Björn Brembs



@brembs

<http://bjoern.brembs.net/2015/04/what-should-a-modern-scientific-infrastructure-look-like/>

Publishers sell us our own work in the guise of curated articles - but essentially they just provide us with a currency which is only valid in academia. We exchange impact factors (‘reputation’) against money.



Impact factors are the rungs of the hamster wheel ...



The current publishing system is sluggish....



<https://www.nature.com/news/does-it-take-too-long-to-publish-research-1.19320>

# Peer review: Intransparent, slow, potentially fraught with bias, sometimes incompetent...



Image via Sarahmirk



[https://dirnagl.files.wordpress.com/2020/11/einsichten-eines-wissenschaftsnarren-32-lj\\_20\\_10.pdf](https://dirnagl.files.wordpress.com/2020/11/einsichten-eines-wissenschaftsnarren-32-lj_20_10.pdf)

English version <https://dirnagl.com/2020/11/28/peer-review-is-dead-long-live-peer-review/>



# COVID Retractions

## THE LANCET

COMMENT | VOLUME 395, ISSUE 10240, P1820, JUNE 13, 2020

### Retraction—Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis

Mandeep R Mehra Frank Ruschitzka Amit N Patel

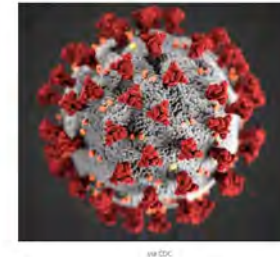
Published: June 05, 2020 • DOI: [https://doi.org/10.1016/S0140-6736\(20\)31324-6](https://doi.org/10.1016/S0140-6736(20)31324-6) Check for updates

CORRESPONDENCE RETRACTION

### Retraction: Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19. N Engl J Med. DOI: 10.1056/NEJMoa2007621.

DOI:10.1056/NEJMoa2007621

### Retracted coronavirus (COVID-19) papers



We've been tracking retractions of papers about COVID-19 as part of our database. Here's a running list, which will be updated as needed. (For some context on these figures, see [this post](#), our letter in *Accountability in Research* and the last section of this *Nature review article*). Also see a note about the terminology regarding preprint servers at the end.)

#### Retracted

1. "3D Technology and induction of coronavirus in skin cells" published in *Biological Regulatory & Homeostatic Agents* on July 16, 2020, withdrawn on July 24, 2020. Our coverage [here](#).
2. "A review of convalescent plasma transfusion in COVID-19: Old wine reserved for special occasions," published in *Lancet India* on September 16, 2020, retracted December 31, 2020.
3. "An epidemiological investigation of a new coronavirus pneumonia cluster epidemic spread in public transportation" (also titled "an epidemiological investigation of 2019 novel coronavirus diseases through aerosol-borne transmission by public transport"), published in early March in *Practical Preventive Medicine* and retracted sometime in mid-April. More context [here](#).
4. "Analysis of Ten Microarray simulation data of SARS-CoV-2 diagnostic multi-proteins" preprint posted on bioRxiv, April 12, 2020, withdrawn April 16, 2020.
5. "Analysis of this-section CT in patients with coronavirus disease (COVID-19) after hospital discharge," published on May 15, 2020 in *Clinical Imaging*; retraction date/reason is unknown.
6. "Can Traditional Chinese Medicine provide insights into controlling the COVID-19 pandemic? Terpenoid-induced lithospheric long-wavelength magnetic anomalies in Proterozoic bedrocks in a weakened geomagnetic field mediate the aberrant transformation of biogenic molecules in COVID-19 via magnetic catalysis" published in *Science of the Total Environment* on October 5, 2020, "temporary removal" on November 5, 2020, subsequently retracted on an unknown date. Our coverage [here](#).
7. "Can Your AI Differentiate Cats from Covid-19? Sample Efficient Uncertainty Estimation for Deep Learning Safety" reportedly to be presented at the ICML 2020 Workshop on Uncertainty and Robustness to Deep Learning in July 2020, removed sometime before June 17, 2020. *Improbable Research* discusses it [here](#).
8. "Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19" published in the *New England Journal of Medicine* on May 3, 2020, subjected to an expression of concern on June 2, and retracted on June 4.
9. "Chinese medical staff request international medical assistance in fighting against COVID-19" letter in *The Lancet* published February 24, 2020 and retracted February 26, 2020. More context [here](#).
10. "Chinese mental health burden during the COVID-19 pandemic" published in *Asian Journal of Psychiatry* on April 14, 2020 and retracted on November 4, 2020. Our coverage [here](#).
11. "Clinical and Epidemiological Characteristics of 34 Children With 2019 Novel Coronavirus Infection in Shenzhen," published in *Zhonghua Er Ke Za Zhi* on February 17, 2020, date of retraction unknown.
12. "Chloroquine or hydroxychloroquine for COVID-19: why might they be hazardous?" published in *The Lancet* on May 22, 2020, retracted and

Retraction  
Watch

**BIH QUEST**  
Transforming Biomedical Research



*Einsichten eines Wissenschaftsnarren (34)*

## **Wie konnte es eigentlich so weit kommen?**

[https://dirnagl.files.wordpress.com/2020/12/einsichten-eines-wissenschaftsnarren-34-lj\\_20\\_12.pdf](https://dirnagl.files.wordpress.com/2020/12/einsichten-eines-wissenschaftsnarren-34-lj_20_12.pdf)



*Einsichten eines Wissenschaftsnarren (35)*

## **Back to the Future: Von industrieller zu inhalt- licher Forschungsbewertung**

[https://dirnagl.files.wordpress.com/2021/03/einsichten-eines-wissenschaftsnarren-35-lj\\_21\\_01-2.pdf](https://dirnagl.files.wordpress.com/2021/03/einsichten-eines-wissenschaftsnarren-35-lj_21_01-2.pdf)



JANUARY 3, 2021

## **Judging science by proxies: A short and incomplete history**



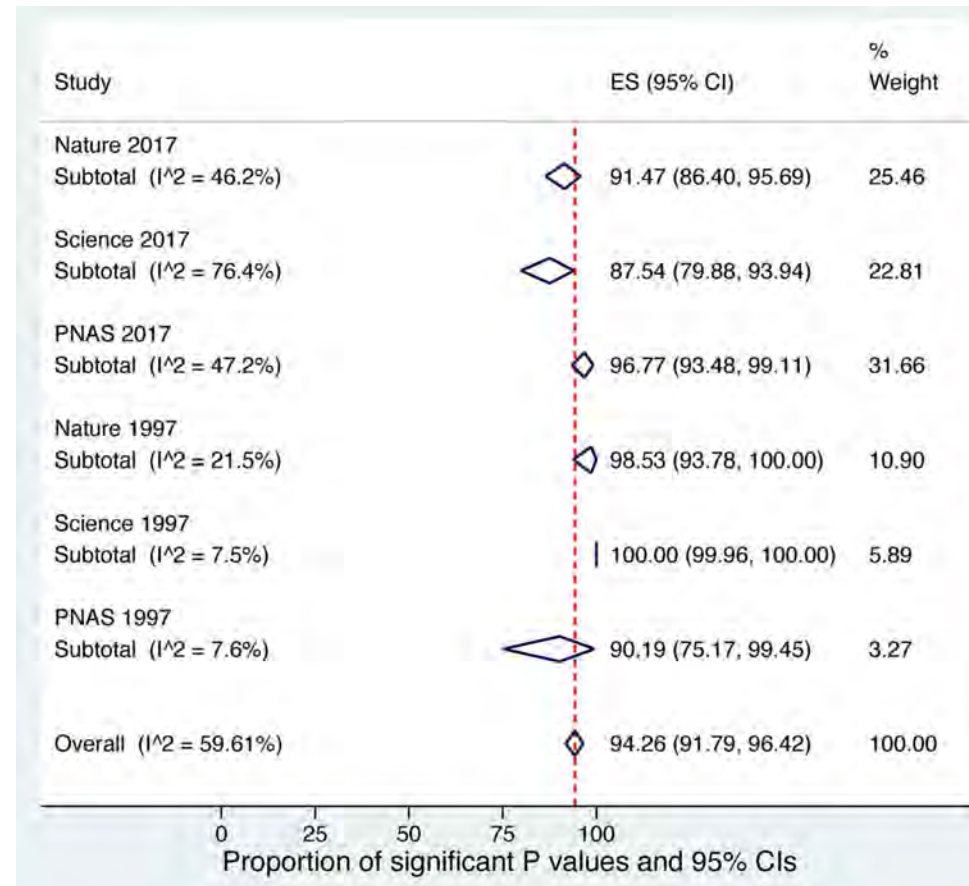
MARCH 13, 2021

## **Judging science by proxies Part II: Back to the future**

<https://dirnagl.com/>



## Inflation bias: *Almost every statistical test is significant ( $p \leq 0.05$ )*



**Citation:** Cristea IA, Ioannidis JPA (2018) P-values in display items are ubiquitous and almost invariably significant: A survey of top science journals. PLoS ONE 13(5): e0197440. <https://doi.org/10.1371/journal.pone.0197440>

## New modes of scientific publishing



## Preprint servers

A preprint is a full draft of a research paper that is shared publicly before it has been peer reviewed.

The logo for arXiv.org, featuring the text "arXiv.org" in white on a red rectangular background.The logo for medRxiv, with "med" in black, "R" in blue, and "xiv" in black.

THE PREPRINT SERVER FOR HEALTH SCIENCES

The logo for bioRxiv, with "bio" in black, "R" in red, and "xiv" in black.

THE PREPRINT SERVER FOR BIOLOGY

...and many, many more

## Preprints

- Fast
- Feedback
- Priority
- Visibility
- Free (in most cases)

## Reporting: Publish 'NULL' results

- Prevents file drawer effect
- Prevents publication bias
- Prevents repetition of futile experiments
- Provides more robust evidence than ‚positive‘ results, i.e. they are more likely to be true than „positive“ results
- Provides boundary conditions for future experiments, ‚stepping stones‘ to „positive“ results
- Allows aggregation of entire evidence base in meta-analysis
- .....

*‚In science, the only failed experiment is one that does not lead to a conclusion‘ (Chris Mack)*

## Reporting: Journals that value scientific and methodological soundness



etc.

Evaluate articles based only on an objective determination of scientific and methodological soundness, not on subjective determinations of 'impact,' 'novelty' or 'interest'.

## Preregistration



# PLOS BIOLOGY

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PERSPECTIVE

## Preregistration of exploratory research: Learning from the golden age of discovery

Ulrich Dirnagl  \*

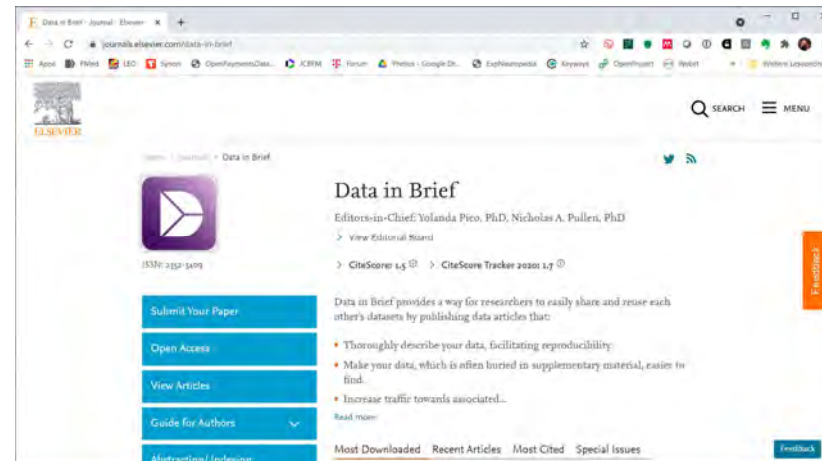
QUEST Center for Transforming Biomedical Research, Berlin Institute of Health, Berlin, Germany

\* [ulrich.dirnagl@charite.de](mailto:ulrich.dirnagl@charite.de)

• <https://doi.org/10.1371/journal.pbio.3000690>



# Reporting: Open data (FAIR use and reuse), Data journals



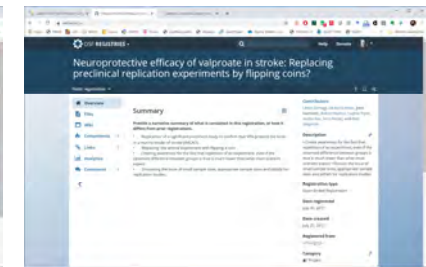
etc.

# (Pre)registration in non-clinical research: Types of registration

All purpose registries (**not** reviewed)

<https://osf.io/>

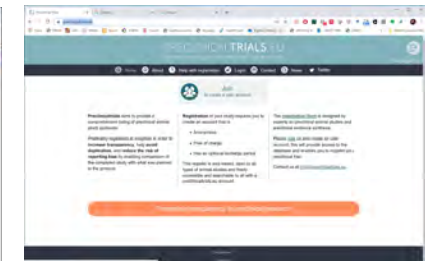
<https://aspredicted.org/>



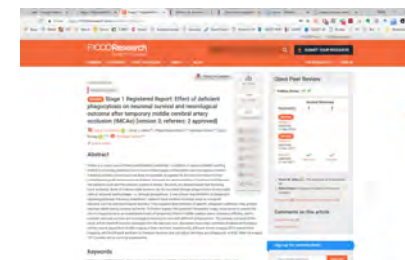
Animal study registries (ASR)  
(**not** reviewed)

[German Centre for the Protection of Laboratory Animals  
https://www.animalstudyregistry.org](https://www.animalstudyregistry.org)

[Preclinicaltrials.eu https://preclinicaltrials.eu/](https://preclinicaltrials.eu)



Registered reports (Elife, PlosBiol, F1000Res etc.) (**reviewed!**)



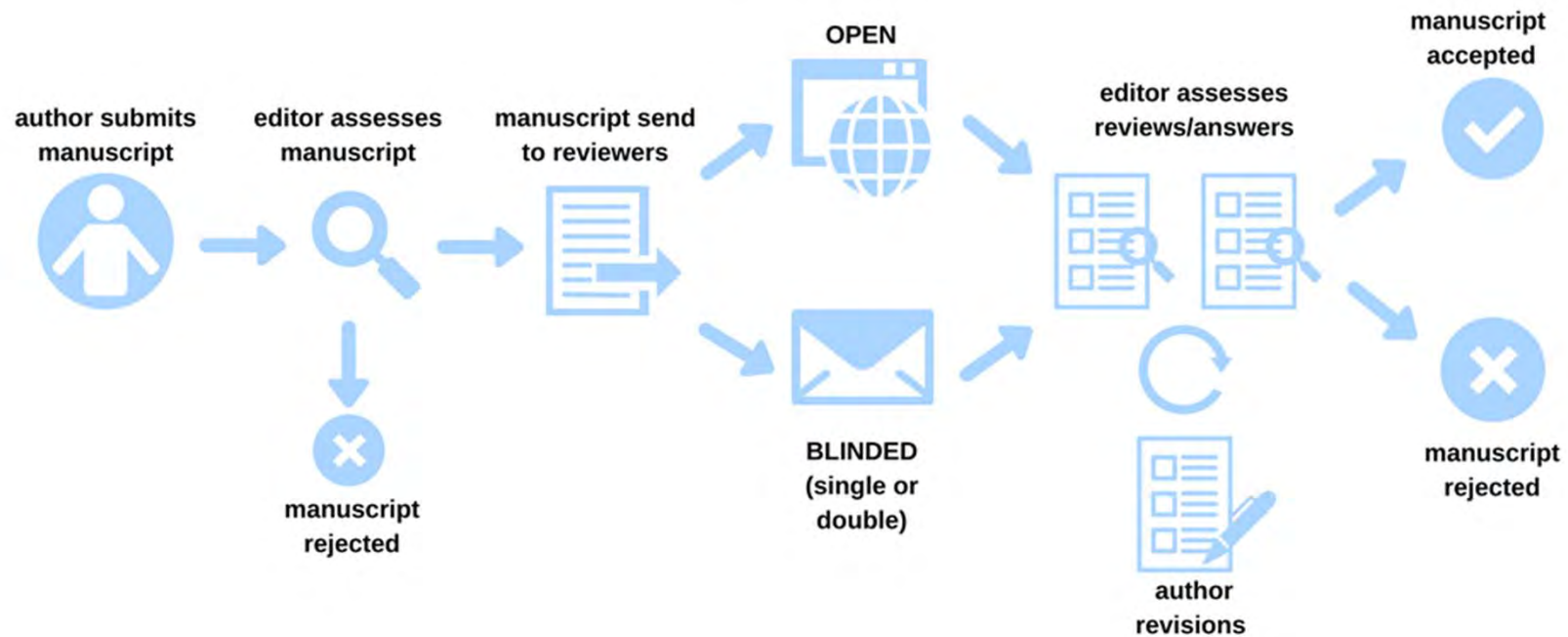
## Registered reports



<https://www.cos.io/initiatives/registered-reports>

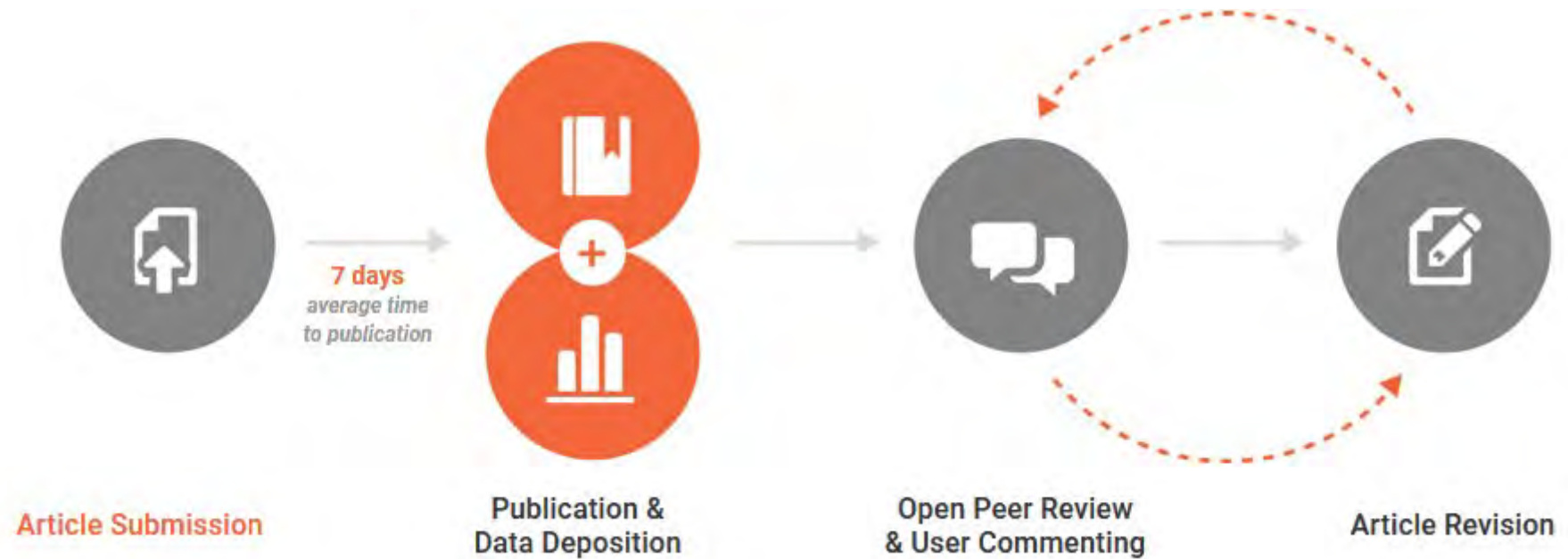
## Open peer review

### Concept of open and blinded Peer Review



<https://socialsciences.nature.com/posts/54659-why-i-think-open-peer-review-benefits-phd-students>

## Open post publication peer review



<https://asapbio.org/f1000-peer-review>

## Examples





# Example F1000Research

The screenshot displays the F1000Research website interface. The top navigation bar is orange with the F1000Research logo and a search icon. Below the header, the breadcrumb trail reads: Home » Browse » Stage 1 Registered Report: Effect of deficient phagocytosis on neuronal... A 'Check for updates' button is visible. The main article title is 'Stage 1 Registered Report: Effect of deficient phagocytosis on neuronal survival and neurological outcome after temporary middle cerebral artery occlusion (tMCAo) [version 3; peer review: 2 approved]'. The authors listed are Julius V. Emmrich, Jonas J. Neher, Philipp Boehm-Sturm, Matthias Endres, Ulrich Dirnagl, and Christoph Harms. A 'Check for updates' button is also present. The article is categorized as a 'STUDY PROTOCOL' and 'Registered report'. On the right side, there is a sidebar with 'ALL METRICS' showing 2160 VIEWS and 447 DOWNLOADS, and a list of actions: Get PDF, Get XML, Cite, Export, Track, Email, and Share. The 'Open Peer Review' section shows the 'Reviewer Status' as '2 approved' (indicated by two green checkmarks) and a table of 'Reviewer Reports'.

Home » Browse » Stage 1 Registered Report: Effect of deficient phagocytosis on neuronal...

Check for updates

STUDY PROTOCOL

Registered report

**REVISED** Stage 1 Registered Report: Effect of deficient phagocytosis on neuronal survival and neurological outcome after temporary middle cerebral artery occlusion (tMCAo) [version 3; peer review: 2 approved]

✉ Julius V. Emmrich <sup>1</sup>, Jonas J. Neher<sup>2,3</sup>, Philipp Boehm-Sturm<sup>1,4</sup>, Matthias Endres<sup>1,5</sup>, Ulrich Dirnagl <sup>1,5,6</sup>, ✉ Christoph Harms<sup>1,6</sup>

Author details

**Abstract**

Stroke is a major cause of death and disability worldwide. In addition to neuronal death resulting directly from energy depletion due to lack of blood supply, inflammation and microglial activation following ischemic brain injury has been increasingly recognized to be a key

**ALL METRICS**

2160 VIEWS

447 DOWNLOADS

Get PDF

Get XML

Cite

Export

Track

Email

Share

**Open Peer Review**

Reviewer Status

✓✓

Reviewer Reports

Invited Reviewers

	1	2
Version 3 (revision)		
16 May 18		
Version 2 (revision)		
14 Nov 17		
Version 1	✓	✓
12 Oct 17	read	read

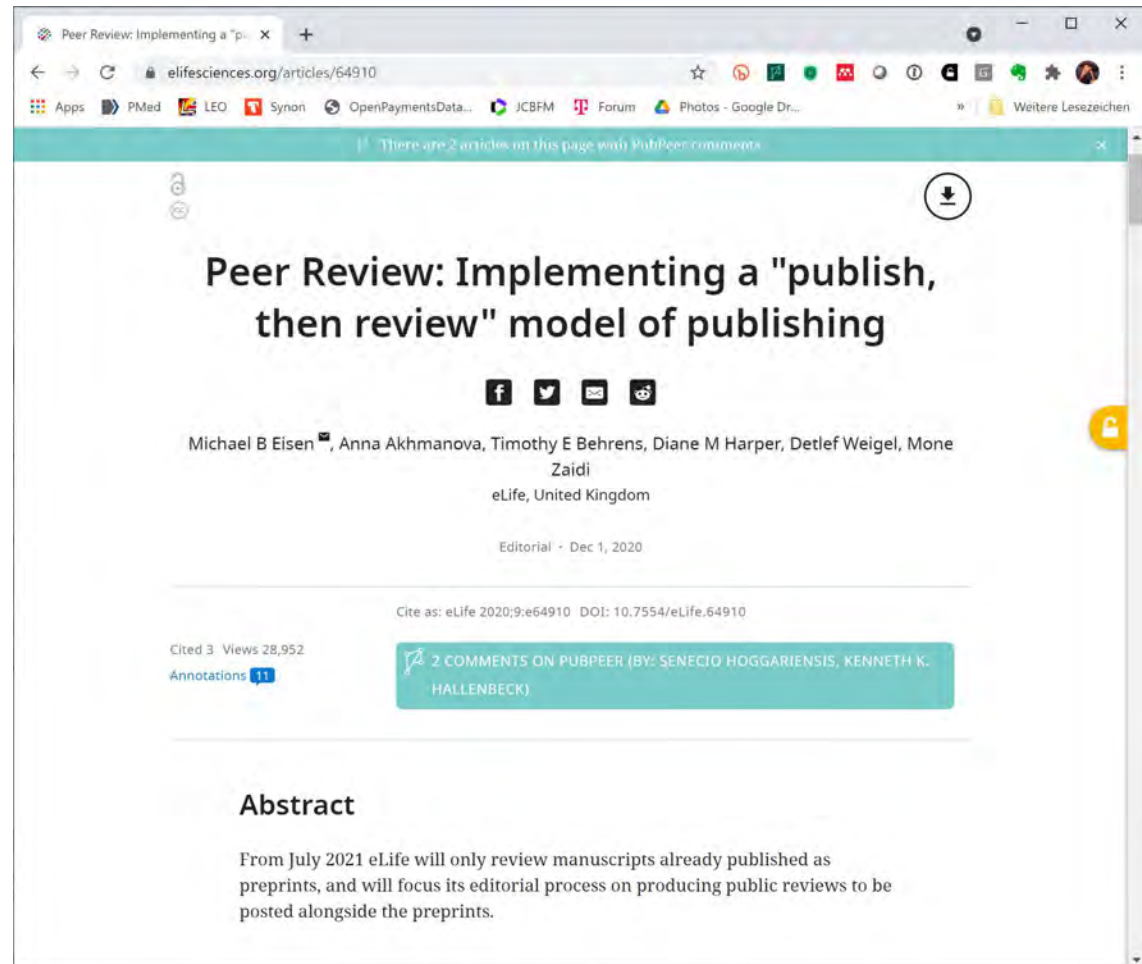
1. Stuart M. Allan <sup>1</sup>, The University of Manchester, Manchester, UK

2. Ádám Dénes, Hungarian Academy of Sciences, Budapest, Hungary



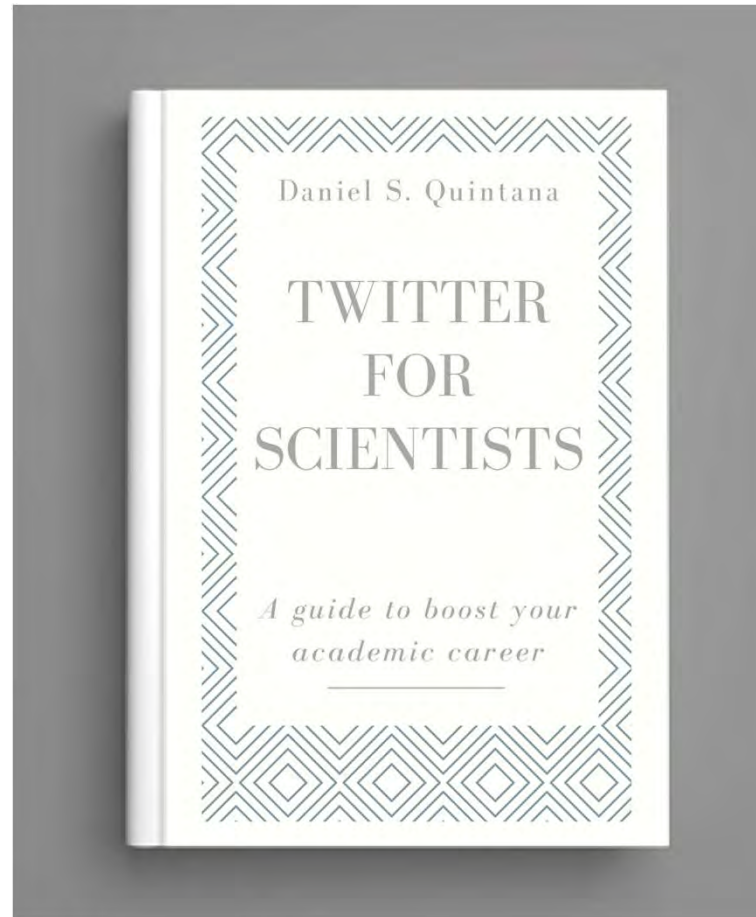
## Example eLife

- Every paper is posted as preprint
- Exclusively reviewing preprints
- Preparing and posting public reviews
- Posting public reviews
- Publication as curation



<https://elifesciences.org/articles/64910>

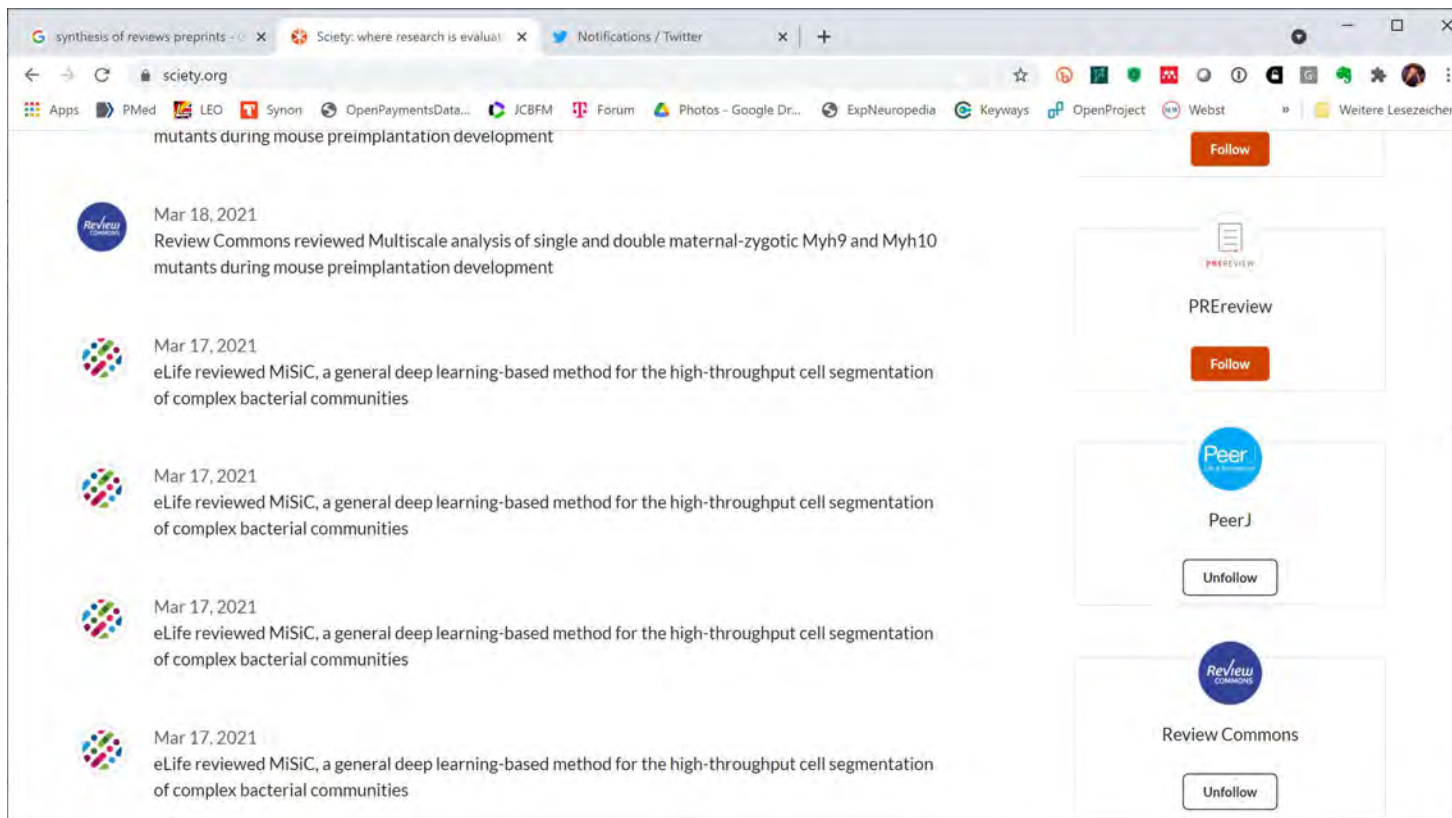
Example ,Science‘



<https://t4scientists.com/index.html>

Sciety.org  **sciety**  
swarm of reviews)

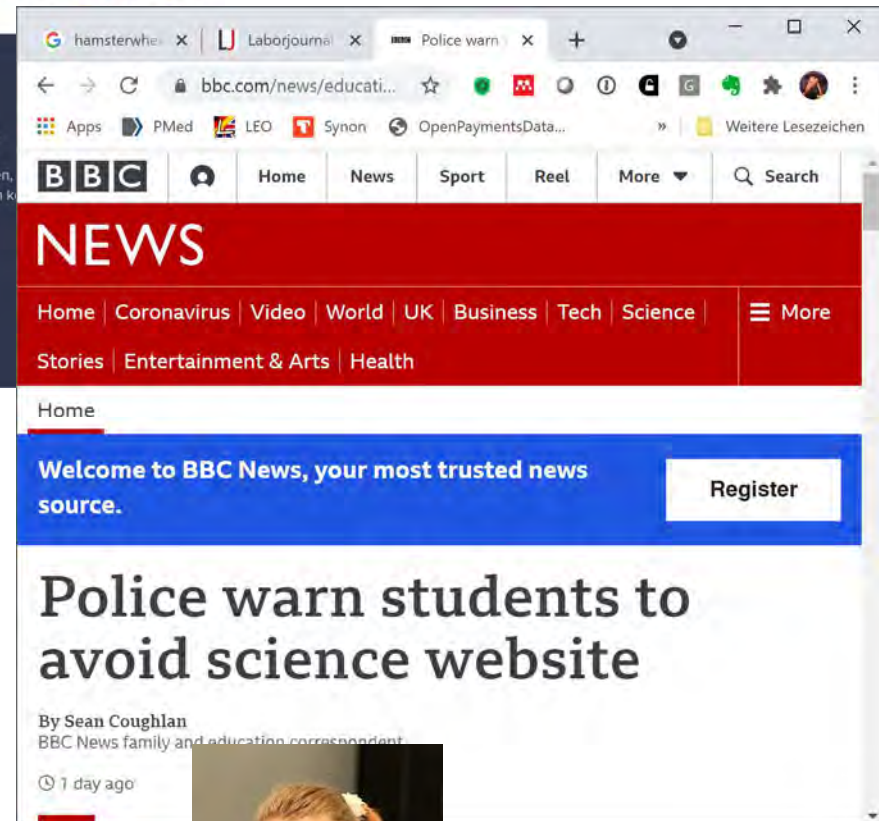
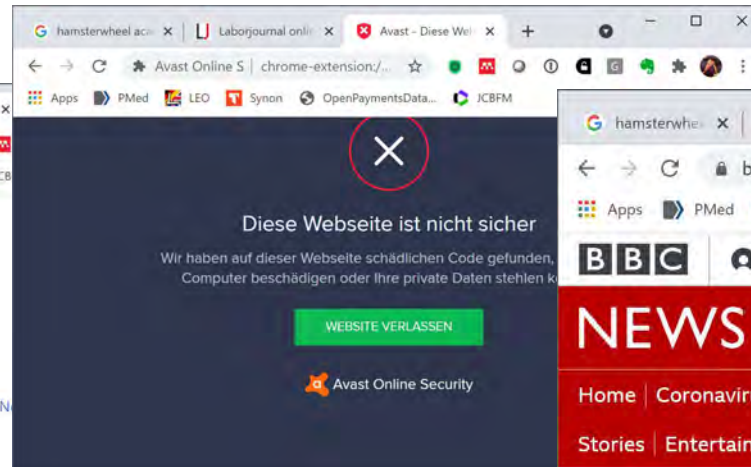
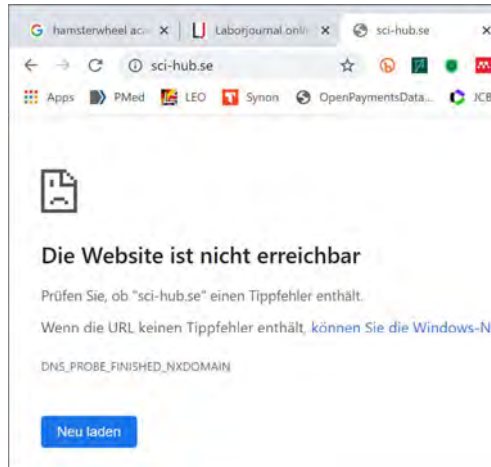
(organizing/ synthesizing the



The screenshot shows a web browser window with the Sciety.org website. The main content area displays a list of reviews under the heading "mutants during mouse preimplantation development". The reviews are dated March 17, 2021, and March 18, 2021. The reviews are from Review Commons, eLife, and PeerJ. The sidebar on the right contains buttons to follow or unfollow these review platforms.

Review Platform	Date	Review Title	Action
Review Commons	Mar 18, 2021	Review Commons reviewed Multiscale analysis of single and double maternal-zygotic Myh9 and Myh10 mutants during mouse preimplantation development	Follow
eLife	Mar 17, 2021	eLife reviewed MiSiC, a general deep learning-based method for the high-throughput cell segmentation of complex bacterial communities	Follow
eLife	Mar 17, 2021	eLife reviewed MiSiC, a general deep learning-based method for the high-throughput cell segmentation of complex bacterial communities	Unfollow
eLife	Mar 17, 2021	eLife reviewed MiSiC, a general deep learning-based method for the high-throughput cell segmentation of complex bacterial communities	Unfollow
PeerJ	Mar 17, 2021	eLife reviewed MiSiC, a general deep learning-based method for the high-throughput cell segmentation of complex bacterial communities	Unfollow

# Example **SCI-HUB** (‘shadow library’) – trying to bring down the system



For current URL check [German Wikipedia](#) entry



Alexandra Elbakyan

**BIH QUEST**  
Transforming Biomedical Research



## Conclusions

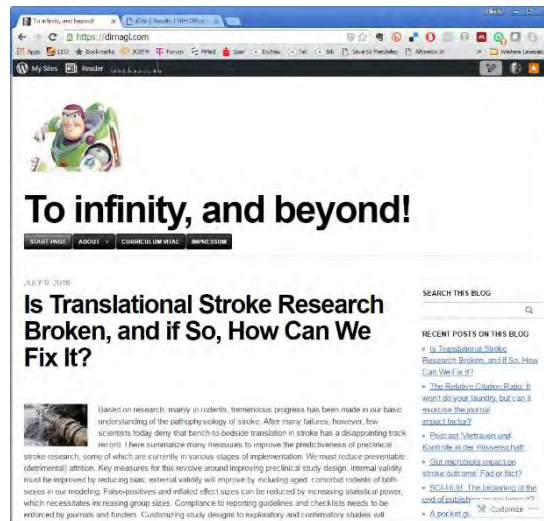
- Too many papers which no one reads (because they are meant for cvs) – while important ones (e.g. ,NULL' results) completely missing
  - System outdated, does not utilize the digital potential
  - Publishers sell us back our own product, value enhanced by an Impact Factor
  - OA in its current form is a business model of the publishers to keep their excessive profit rates
  - Peer review in its present form erratic, intransparent, and often flawed
  - While being extremely expensive (at our cost – resources could be spent on research) the system is also sluggish
- 
- The dawn of a new era (?)
  - Preprints
  - Preregistration and registered reports
  - NULL and data reports
  - Post publication and / or open review
  - Novel criteria for acceptance (soundness vs spectacular...)
  - Social media for scientific discourse (incl. reviews)

Small print: A new era will only materialize if institutions and funders change their criteria for hiring, funding, and promotion!

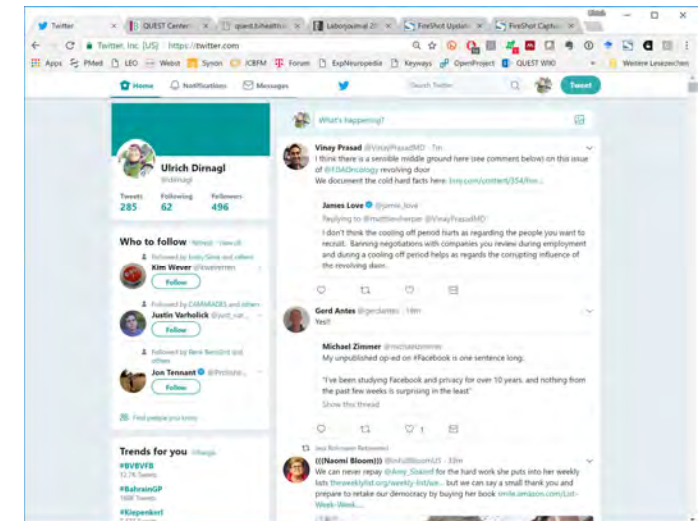
Slide download: <http://bit.ly/>



Monthly column  
[laborjournal.de](http://laborjournal.de)



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