



# Open Science

Better standards  
and outcomes

## Part I – Papers, Papers, Papers

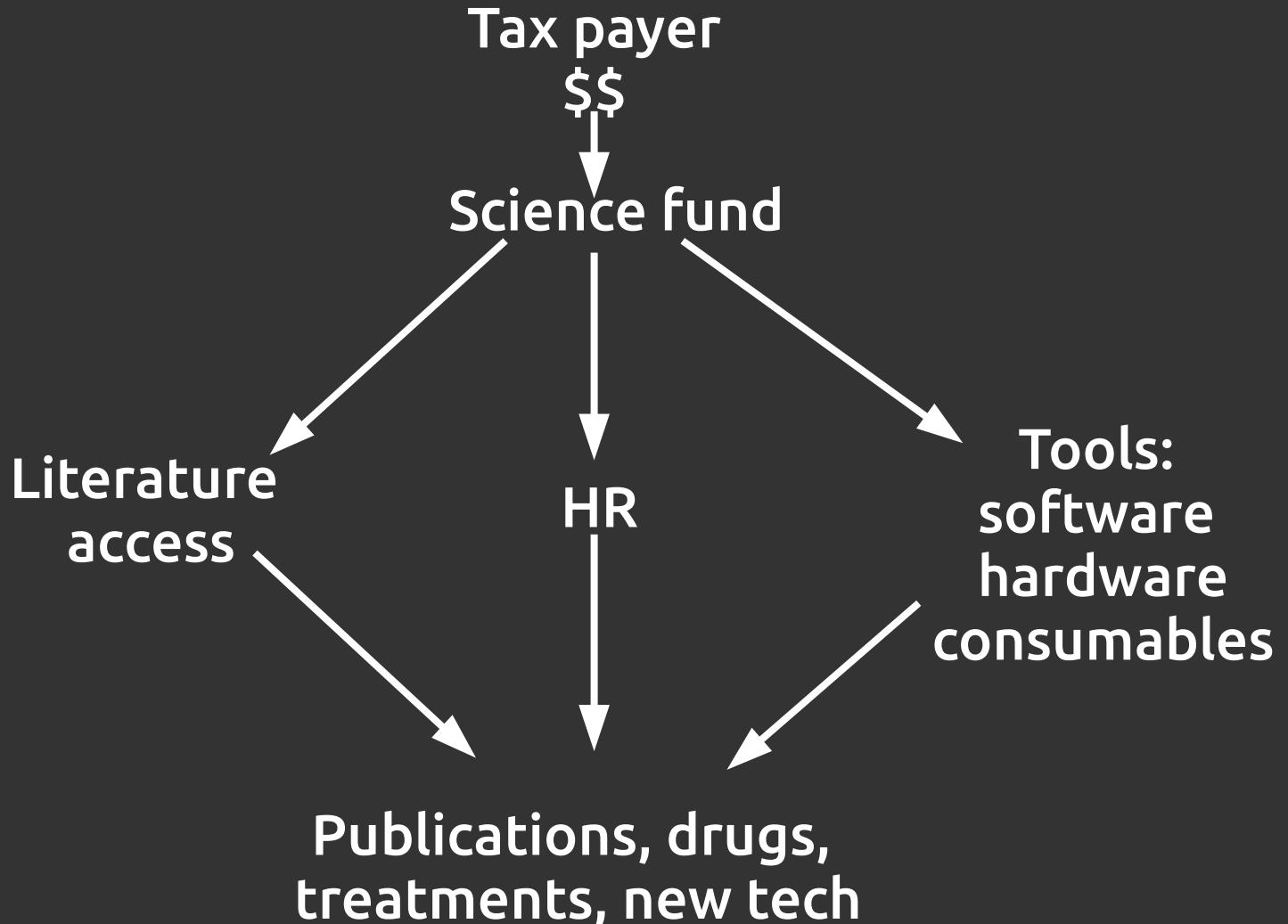


André Maia Chagas  
Ophthalmic Research Laboratory  
Eye clinic - University of Tübingen  
Progress report Dec 13<sup>th</sup> 2017



# Outlook

- How science is funded
- Papers: how to get them and their scientific value
- Tools: Software → Are they always doing what you expect?
- Tools: Equipment → Need to be so expensive? And so slow to change?
- Summary / questions



# So you want to read a paper?

READ THE FULL ARTICLE

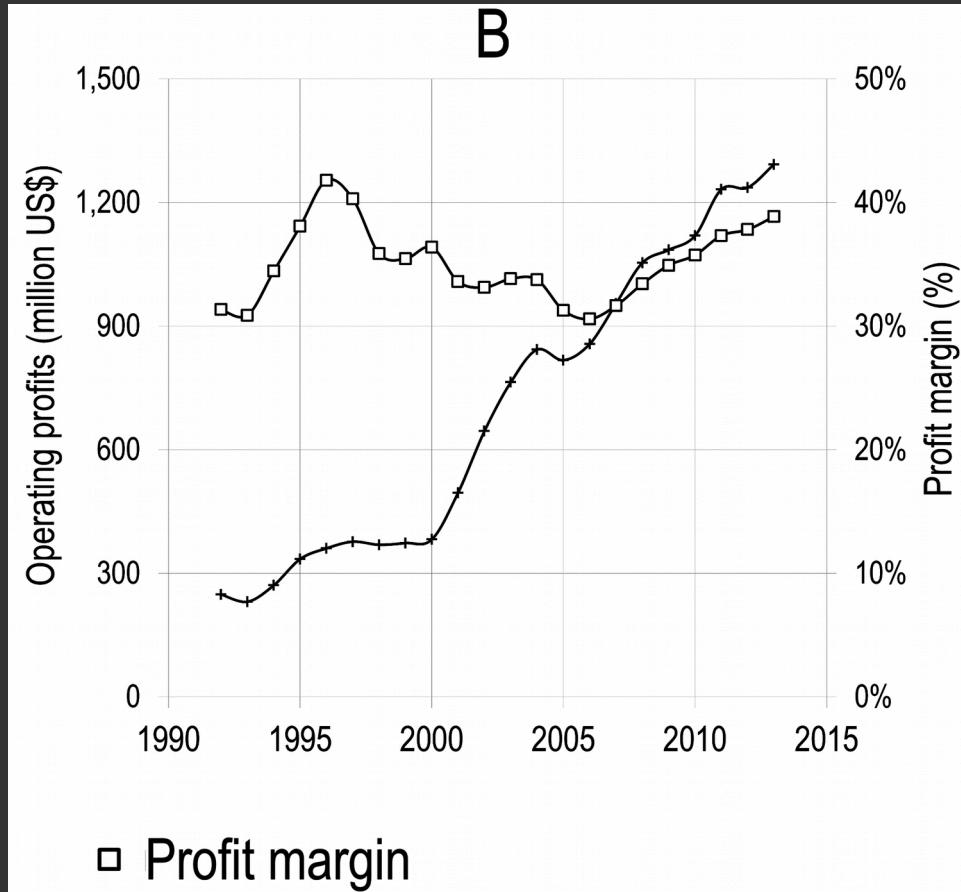
<b>Subscribe to <i>Nature</i> for full access:</b> <b>\$199</b>	<b>ReadCube Access*:</b> <b>\$4.99 rent</b> <b>\$9.99 buy</b>	<b>Purchase article full text and PDF:</b> <b>\$32</b>
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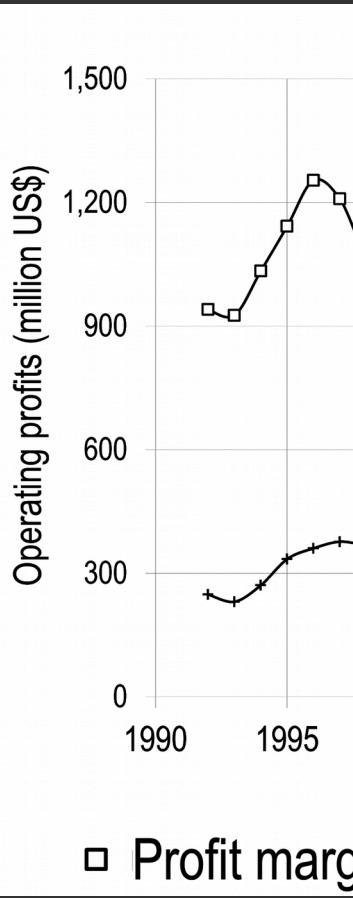
# Business as usual...



In the same  
range:  
Banks  
Pharma  
Auto companies

“Gate keepers” make a lot of PROFIT:  
- Something they did not create!  
- Was already paid for with public money  
-Estimation 2017:  
-1 paper 3800-5000 Euros

# Business



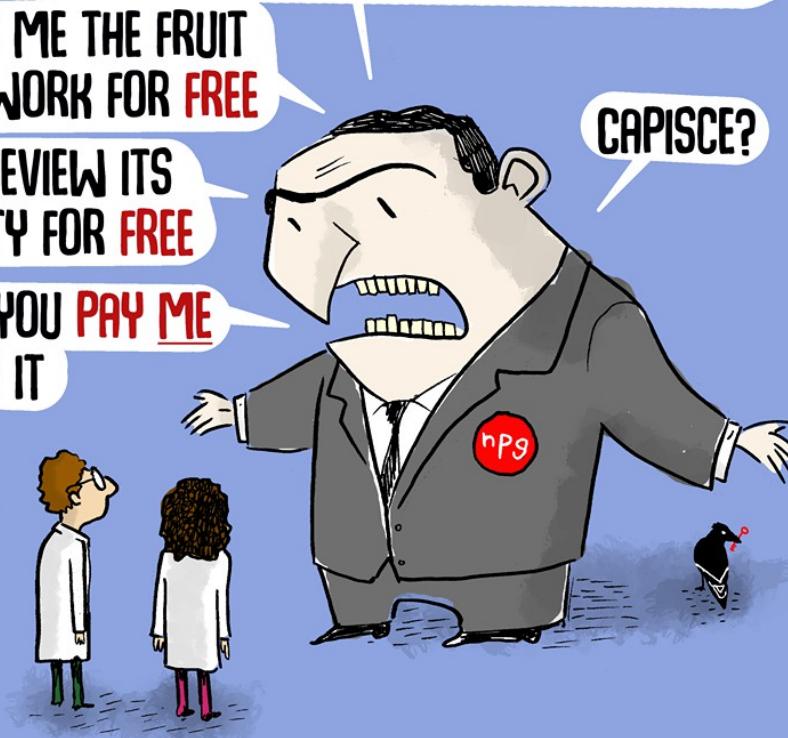
## LOOK YOU NERDS IT'S A SIMPLE BUSINESS MODEL

YOU HAND ME THE FRUIT  
OF YOUR WORK FOR **FREE**

YOU REVIEW ITS  
QUALITY FOR **FREE**

AND THEN YOU **PAY ME**  
TO ACCESS IT

CAPISCE?



PEDROMICS

ake a lot of PROFIT:  
I did not create!  
For with public money

5000 Euros

# Except it has been overdone...

[Open access scientific publishing](#)

## Harvard University says it can't afford journal publishers' prices

University wants scientists to make their research open access and resign from publications that keep articles behind paywalls

## Memorial University to cancel thousands of journal subscriptions

**Professors say cuts will damage MUN's reputation, hurt student recruitment**

By Laura Howells, [CBC News](#) Posted: Dec 08, 2015 8:01 AM NT | Last Updated: Dec 08, 2015 4:09 PM NT

...And has lost a lot of value...

# Peer review post-mortem: how a flawed aging study was published in Nature

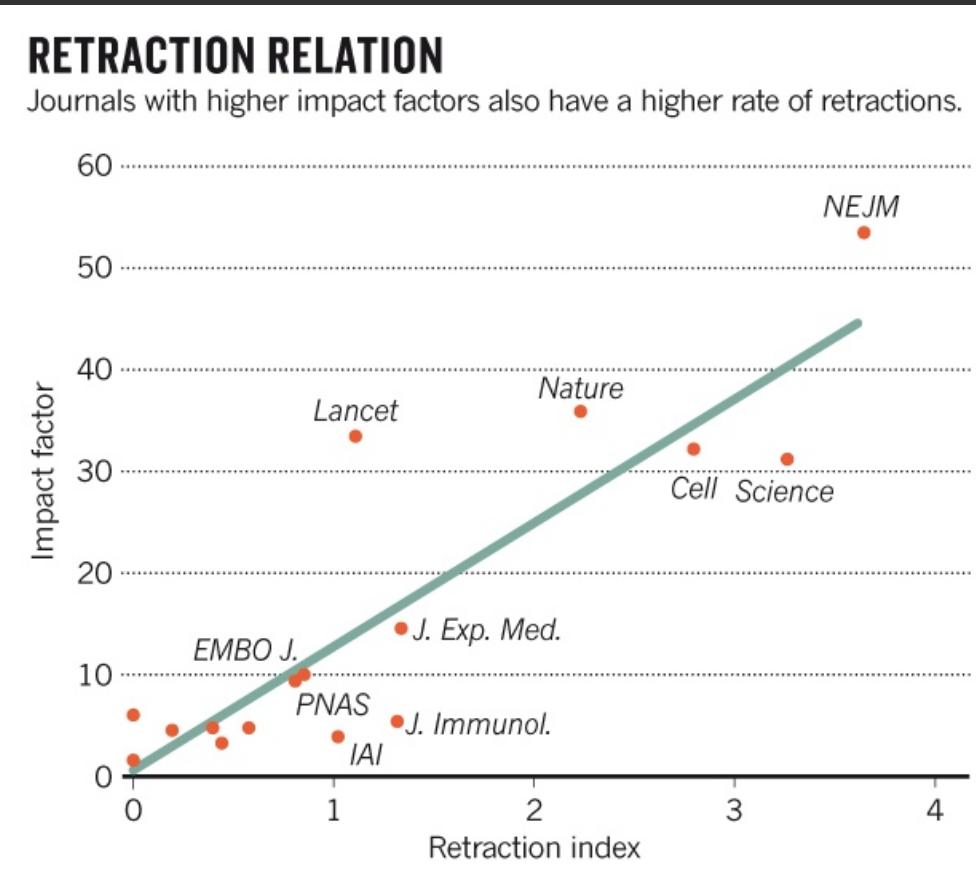
How could an article with numerous shortcomings be published in top-tier journal Nature? Hester van Santen reveals how the gate-keepers of science knowingly let flawed research slip through.

↗ Hester van Santen ⏲ 9 december 2016 om 6:00

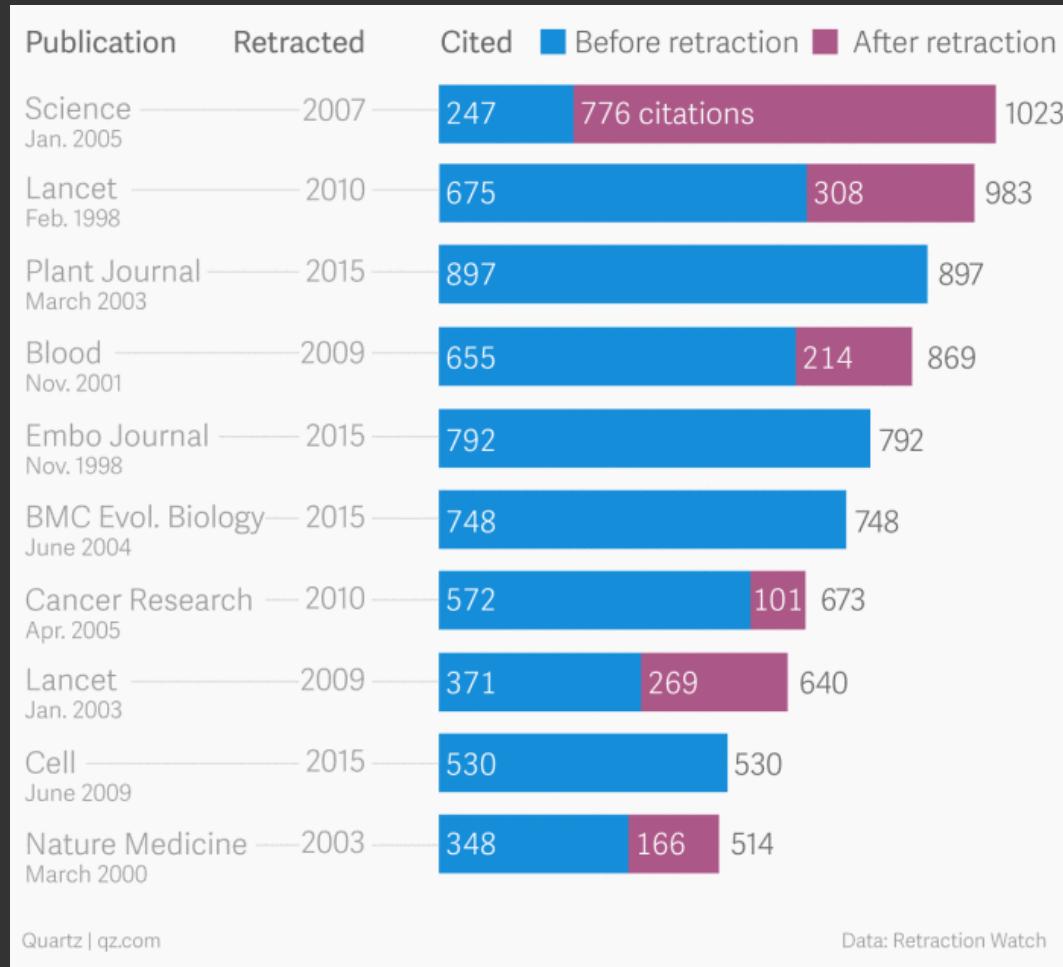
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“Nature asks reviewers to look at statistics “if time is available „,

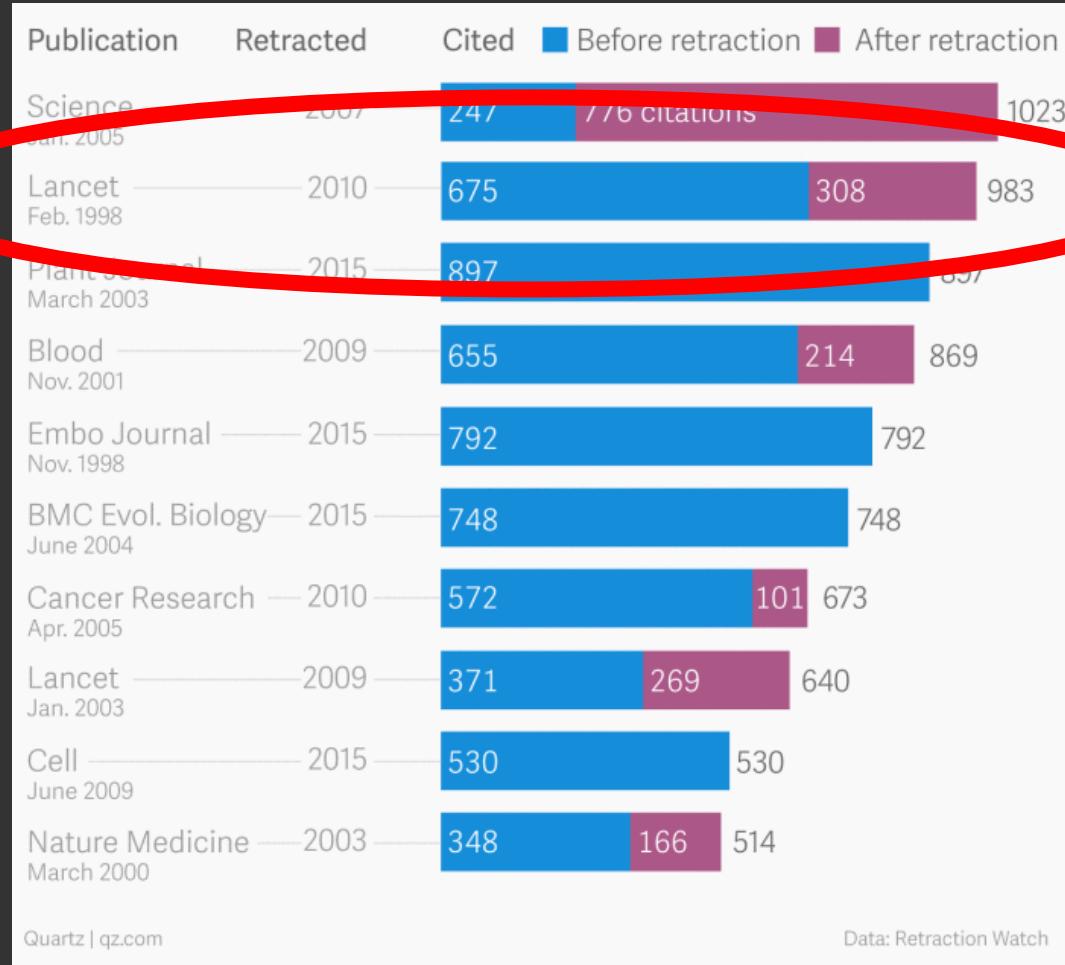
# ...And has lost a lot of value...



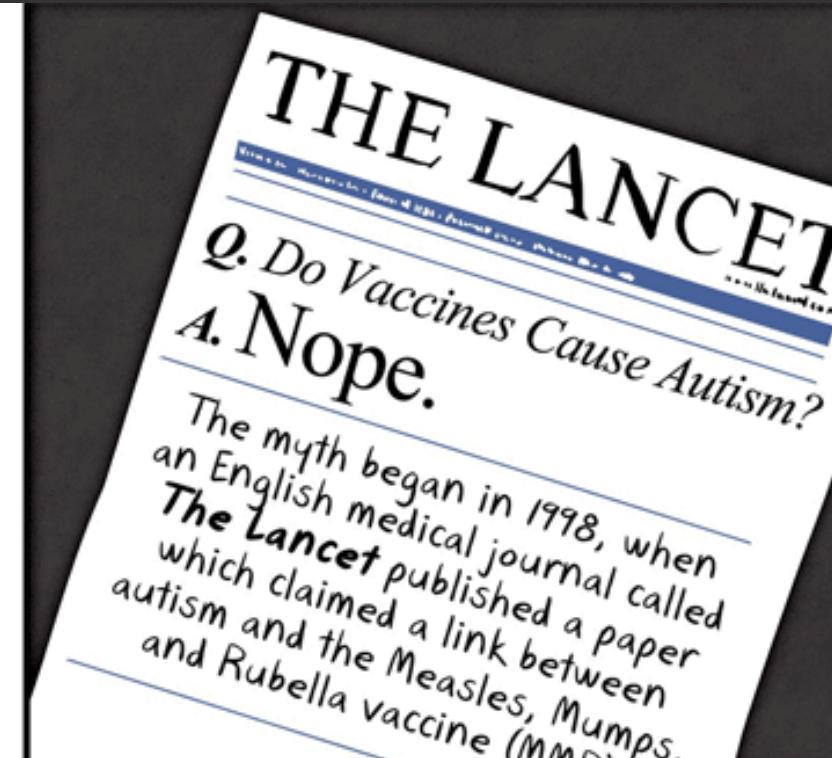
# ...And has lost a lot of value...



# ...And has lost a lot of value...



# ...And has lost a lot of value...



# Not only retractions are problematic...



NATURE | NEWS



## Over half of psychology studies fail reproducibility test

Largest replication study to date casts doubt on many published positive results.



Monya Baker

27 August 2015

100 publications “tested”

50 publications originally planned

Only 29 will enter due to difficulties in obtaining details on methods

Rigorous replication effort succeeds for just two of five cancer papers

By Jocelyn Kaiser | Jan. 18, 2017, 1:00 PM

# Summary I

- Publication system:
  - Unchanged since 17<sup>th</sup> century
  - Hijacked by (obscene) profit driven companies
  - Influences (in a bad way) what is perceived as good science
    - Leads to catchy media highlights:
      - “Researchers found that #whateverjustcameout gives you cancer”

# Alternatives/new methods

- Open access
- Pre-prints/archives
- Registered studies
- Demand for data and code

# The push back:

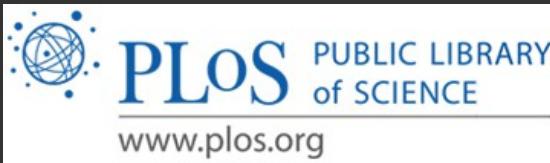
A bold open-access push in Germany could change the future of academic publishing

By **Gretchen Vogel, Kai Kupferschmidt** | Aug. 23, 2017 , 12:15 PM

Project Deal → ~200 German institutions together to negotiate fair prices for open access papers.

Current status (Dec 2017) – Stand-off with Elsevier. Other publishing companies have already accepted the terms proposed by the project

# Enters Open Access and innovative publishing

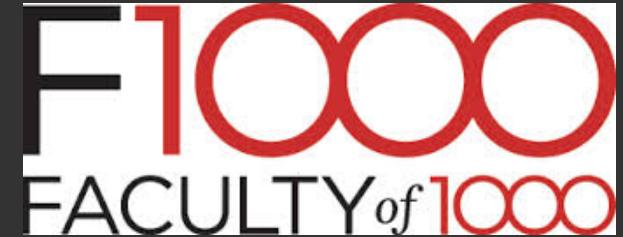


Pay once, access it forever.

Estimation: one paper 1300-2000€

Plus all “major” journals have an open access option

# Some highlights



# Some highlights

PeerJ = Open

Transparency, trust, and quality

Post-publication peer review history

## PeerJ Factsheet

To help when considering journal options with your co-authors

### Statistics

Launch	February 2013
Subjects	151
Impact factor	2.2
Articles published	4,080
Monthly readers	500,000
Publication speed	Median 25 days to first decision

### Editors and Advisors



**Harald zur Hausen**

Nobel-Prize in Medicine



**Dorothy Bishop**

Royal Society fellow, British Academy



**Kurt Wüthrich**

Nobel-Prize in Chemistry



**Steffanie Strathdee**

Associate Dean of Global Health Sciences



**1,673 Editors and Advisors**

Handling peer-review across 151 subjects

# Some highlights



eLIFE

## Promoting understanding of research

For selected papers, we prepare non-technical summaries ([eLife digests](#)) so that the research we publish is accessible to a broader audience, including scientists in other fields, students, funders, policy makers and others.

## Supporting reproducibility

eLife authors are encouraged to publish their work in full and are required to provide the key underlying data as part of their paper. We support projects such as Research Resource Identifiers (RRIDs) that promote unambiguous identification of reagents and materials. eLife is also the publishing partner for the [Reproducibility Project in Cancer Biology](#).

# Some highlights



If you have a project that is entering the planning or data collection phase, we'd like you to try out a preregistration. Through our **\$1 Million Preregistration Challenge**, we're giving away \$1,000 to 1,000 researchers who preregister their projects before they publish them. It's straightforward to complete and will really enhance your research output.

# But what about my impact?!

New study: Research impact of paywalled versus open access papers

Study on 3.3 million papers and 35 million citations

-Open access papers:  
- 52% more citations

# Archives → Deposit a paper and move on from there...



Archive items get a DOI → can be cited and changes can be tracked



bioRx  
THE PREPRINT SERVER FOR



Philipp Berens @CellTypist · Jul 24

our first prepub review on [@biorxiv\\_neurisci](#) for mouse behavior paper

 Mice use robust and common strategies to discr...

Mice use vision to navigate and avoid predators in natural environments. However, the spatial resolution of mouse vision is poor compared to primates, and mic...

[biorxiv.org](#)



1



12



29



Labrigger  
[@Labrigger](#)

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Thanks so much! Here's the response: this blog post

[s1slab.org/nid/2017/08/23 ...](#) links to this PDF: [s1slab.org/nid/wp-content ...](#)

5:01 AM - 23 Aug 2017



eprint archive for Paleontology  
Powered by OSF Preprints

griXiv

# Doesn't exclude “traditional” publishing

New Results

## The 100 Euro Lab: A 3-D Printable Open Source Platform For Fluorescence Microscopy, Optogenetics And Accurate Temperature Control During Behaviour Of Zebrafish, Drosophila And C. elegans

Andre Maia Chagas, Lucia Prieto Godino, Aristides B Arrenberg,  Tom Baden

doi: <https://doi.org/10.1101/122812>

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

 Previous

Posted March 31, 2017.

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COMMUNITY PAGE

The €100 lab: A 3D-printable open-source platform for fluorescence microscopy, optogenetics, and accurate temperature control during behaviour of zebrafish, *Drosophila*, and *Caenorhabditis elegans*

Andre Maia Chagas , Lucia L. Prieto-Godino, Aristides B. Arrenberg, Tom Baden 

Published: July 18, 2017 • <https://doi.org/10.1371/journal.pbio.2002702>

69 Save	2 Citation
28,306 View	225 Share

# Not a career killer...

## On gaining tenure as an open scientist

On December 10th, 2014, I was formally awarded tenure at UC Davis, where I will start as an Associate Professor in the School of Veterinary Medicine on January 5th, 2015. In [my research statement for my job application](#), I wrote:

*Open science and scientific reproducibility: I am a strong advocate of open science, open source, open data, open access, and the use of social media in research as a way to advance research more broadly.*

Fri 26 December 2014

By [C. Titus Brown](#)

In [science](#).

tags: [tenure](#) [open science](#)

# Scenes from the next episodes? - Software

**Format:** Abstract ▾

[Genome Biol.](#) 2016 Aug 23;17(1):177. doi: 10.1186/s13059-016-1044-7.

**Gene name errors are widespread in the scientific literature.**

Ziemann M<sup>1</sup>, Eren Y<sup>1,2</sup>, El-Osta A<sup>3,4</sup>.

 [Author information](#)

1 Institute of Biochemistry and Cell Biology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China  
2 Department of Cell Biology, New York University School of Medicine, New York, NY, USA  
3 Department of Pharmacology, New York University School of Medicine, New York, NY, USA  
4 Department of Molecular Pharmacology, New York University School of Medicine, New York, NY, USA

# Software

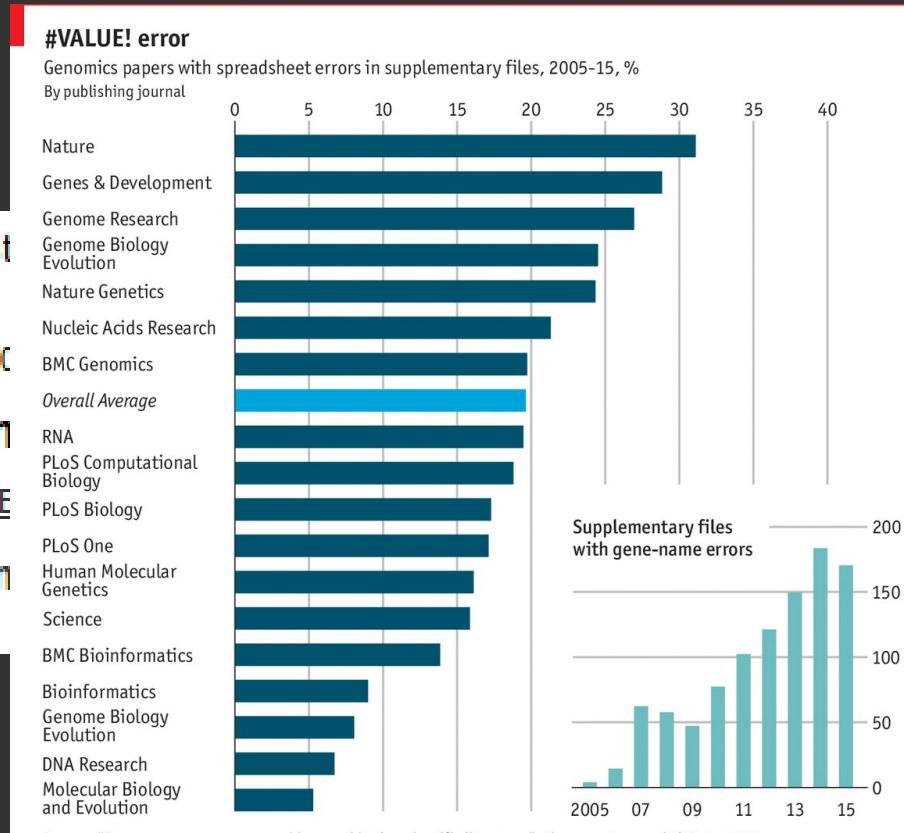
## Format: Abst

Genome Biol. 20

## Gene name

Ziemann M<sup>1</sup>, E

+ Author in



## 3 literature,

# Summary II

- Paywalls and the use of proprietary tools in academia:
  - Shuts a lot of people out
  - Makes public pay twice for scientific development
  - Hinders the quality of the scientific output
- Open source / Open access allows:
  - Transparency
  - Distributed development
  - Proper use of data
  - Robustness

# Our Perceptions

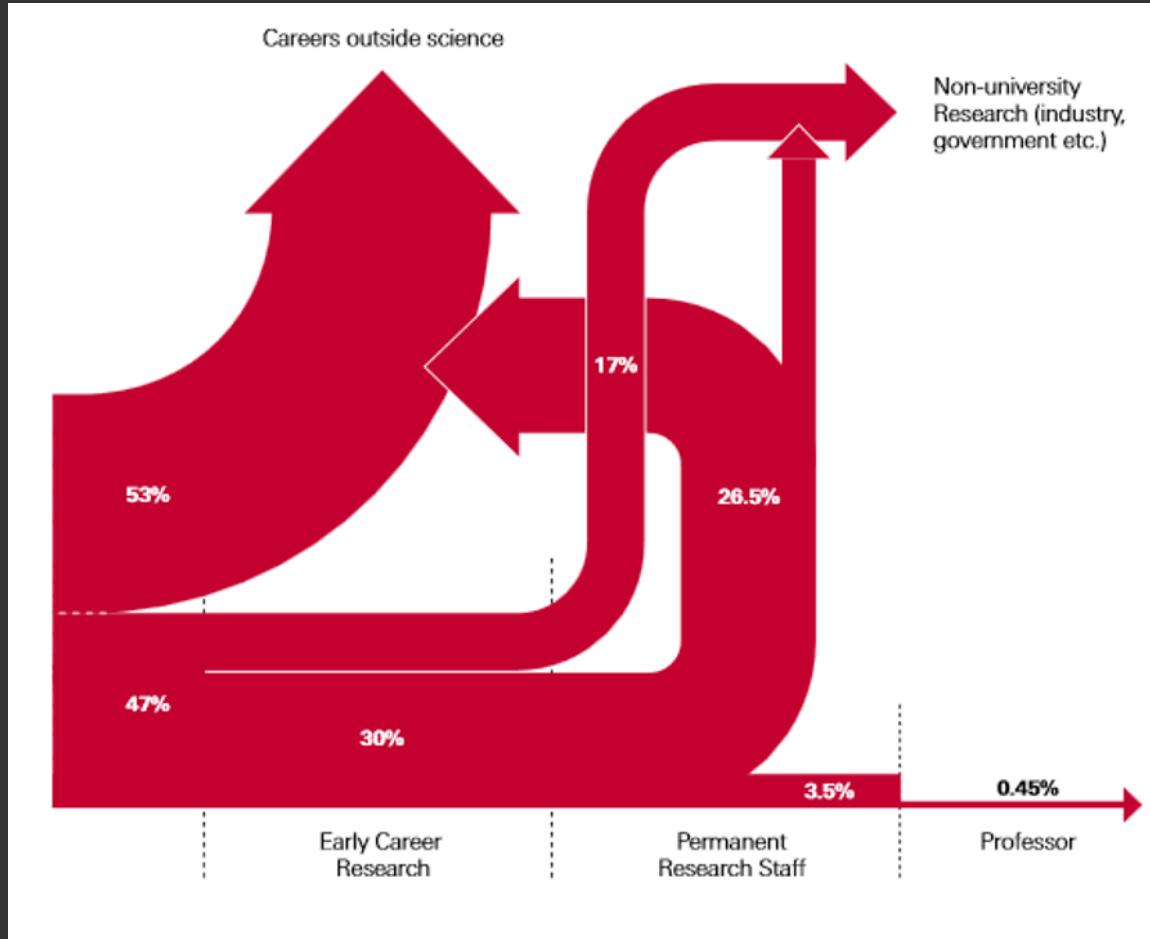


# Thank you for your attention!

- Questions?
  - Curious about other open access/innovative publishing methods?
  - Curious about open source tools for neurosciences

[www.openeuroscience.com](http://www.openeuroscience.com)

# Chances are slim...



So you might as well do  
the right thing...

# Open Source?

- All plans and blueprints of software/hardware/recipes are freely (as in freedom) shared somehow (online, pen-drives, grandma's notebook...)





# Except it has been overdone...

Supporting Students With Disabilities During School Crises

Laura S. Clarke, Dusty Columbia Embury,  
Ruth E. Jones, Nina Yssel [#icanhaspdf](#)

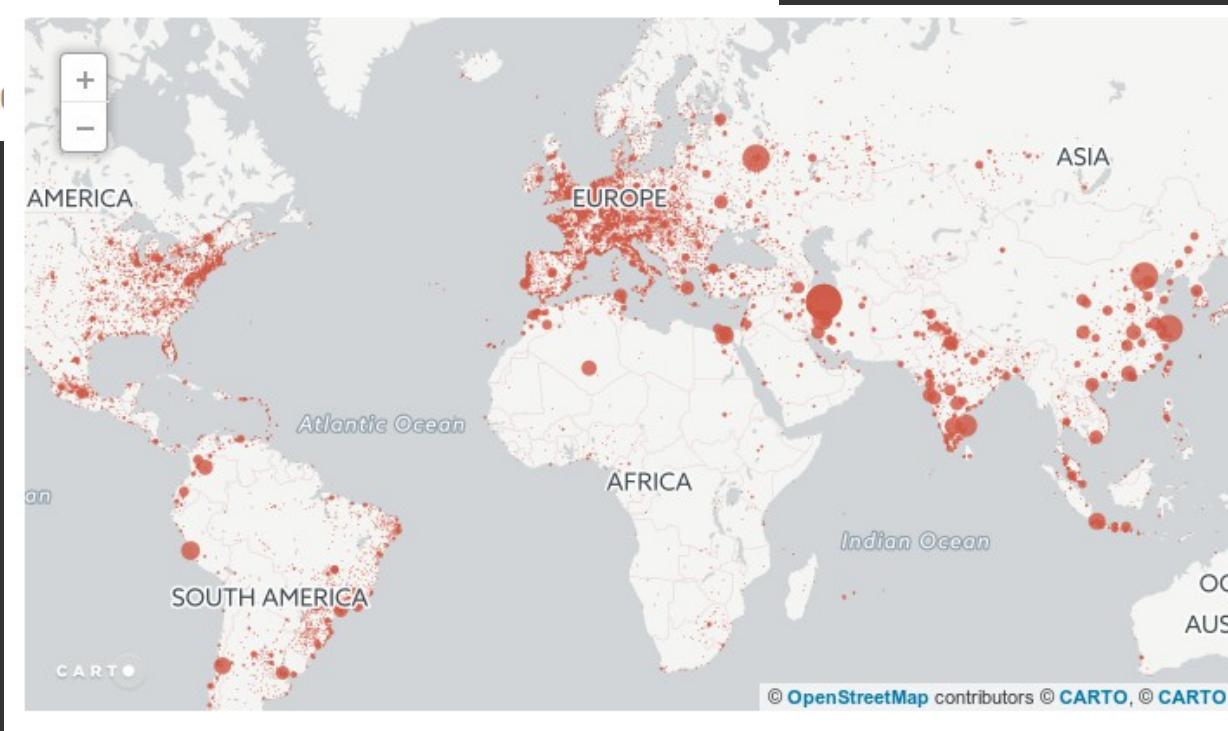
4:22 PM - 7 Mar 2017

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# Except it has been overdone...

Sci-Hub's cache of pirated papers is so big, subscription journals are doomed, data analyst suggests

By Lindsay McKenzie | Jul. 27, 2015



# ...That is also outdated...

- Content mining? NOT ALLOWED
- Smart Tagging? NOT ALLOWED