

Open Access, PLOS ONE, & the rise of the MegaJournal

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The Current Publication Landscape

- Approx 150 million ‘knowledge workers’ read
- the work of 10 million ‘publishing’ academics
- who are publishing 1.5 million papers per year
- into 25,000 (mostly subscription) journals
- published (mostly) by 5 very large publishers
- for an annual revenue of approx \$10 billion
- at a profit margin of around 30-40%

But it's being rapidly disrupted by OA Publishing...



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- The Bethesda Definition of Open Access (2003)
 - Free, immediate access
 - Deposition in a digital public archive
 - Unrestricted reuse

The inspiration for Open Access is not a new idea

*“I want a poor student to have the same means
of indulging his learned curiosity,
of following his rational pursuits,
of consulting the same authorities,
of fathoming the most intricate inquiry
as the richest man in the kingdom...”*

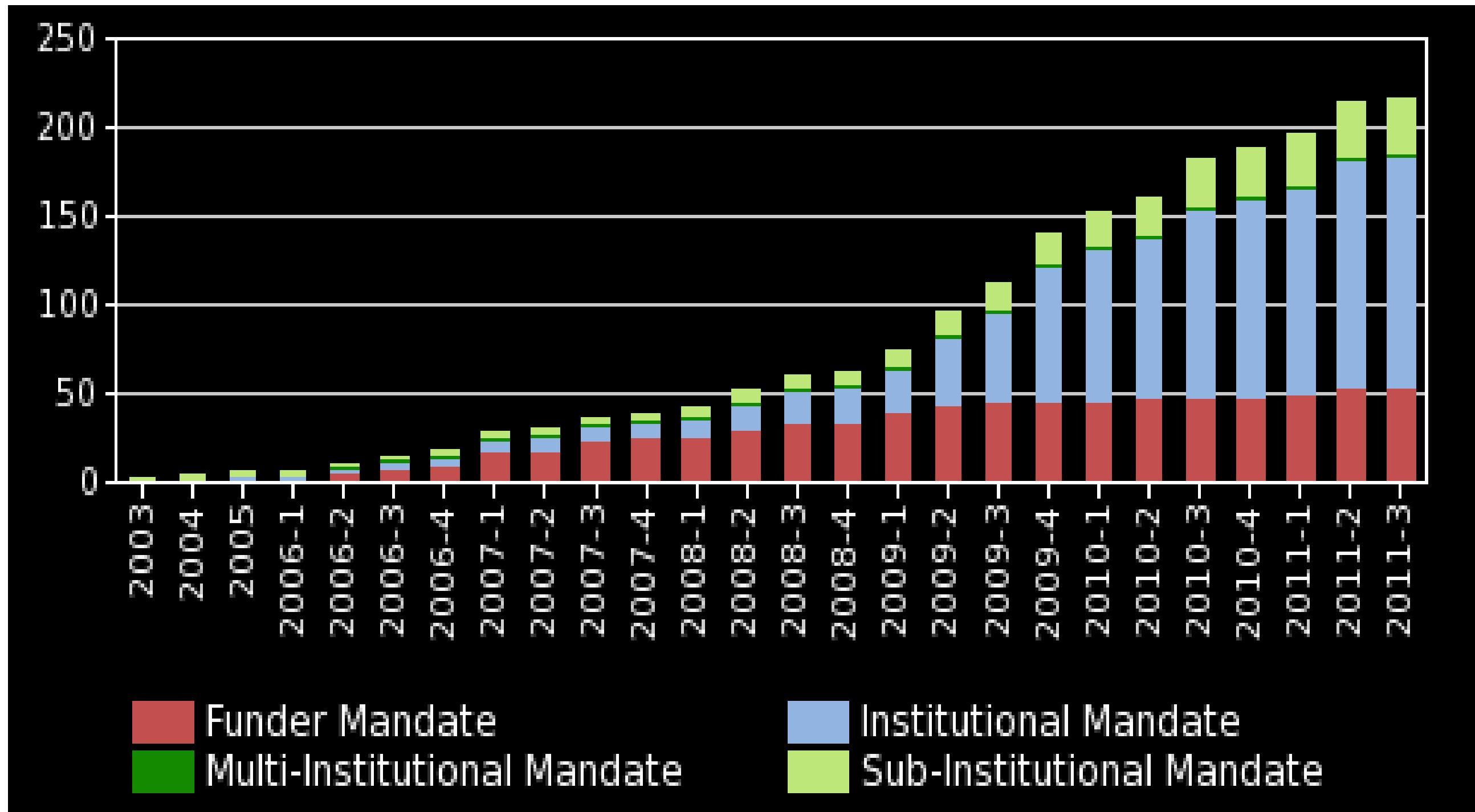
Antonio Panizzi, 1836

Principle Librarian of the British Museum

Open Access is Evolving

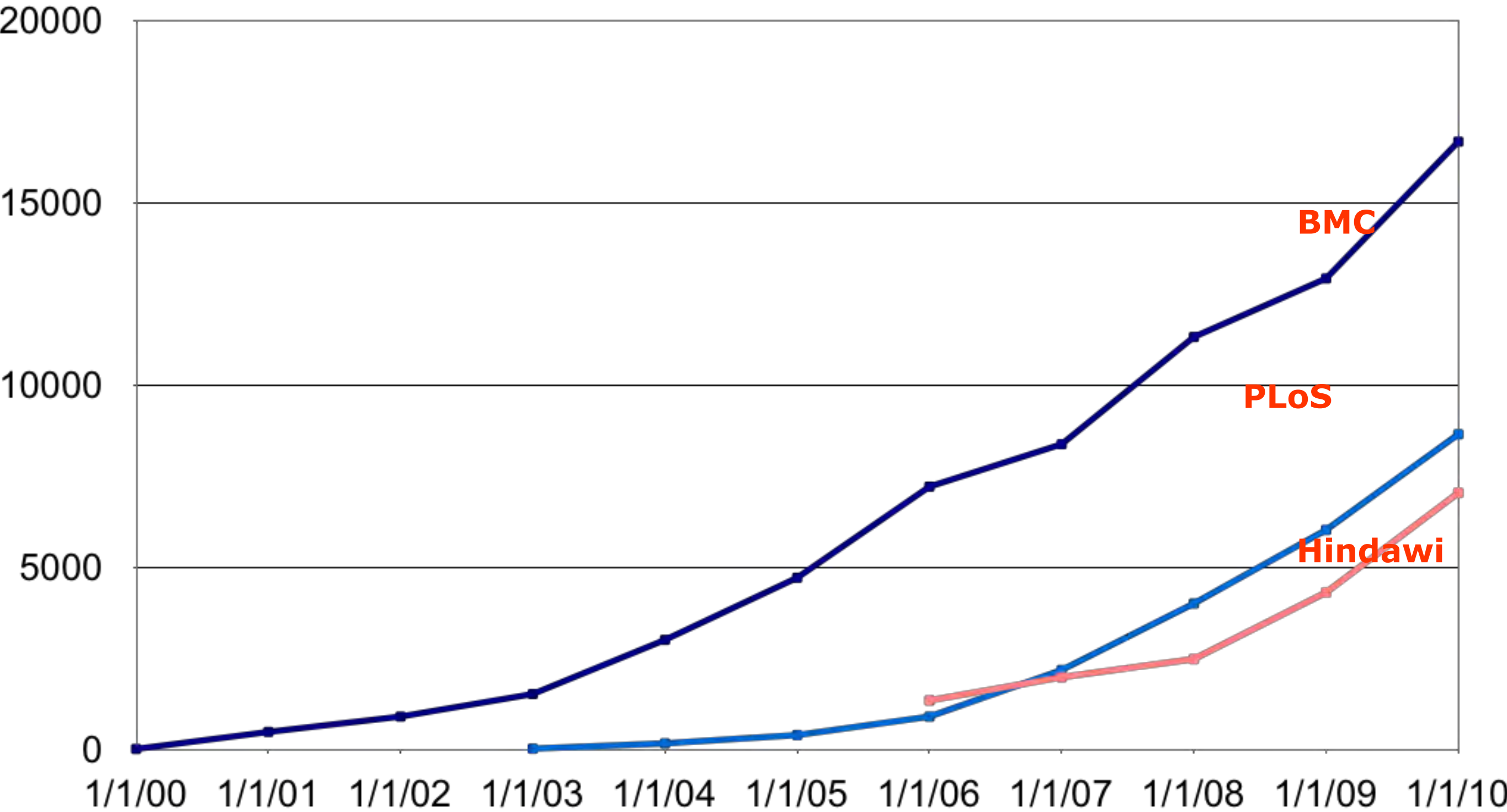
- What started as:
 - a reaction to ‘high priced journals, sold by exploitative **publishers**’
 - an emotive debate centering around access by the public to research
 - a ‘taxpayer’ issue
- has now matured into:
 - the most logical and effective way to disseminate knowledge in the information age!

Growth of OA Policies

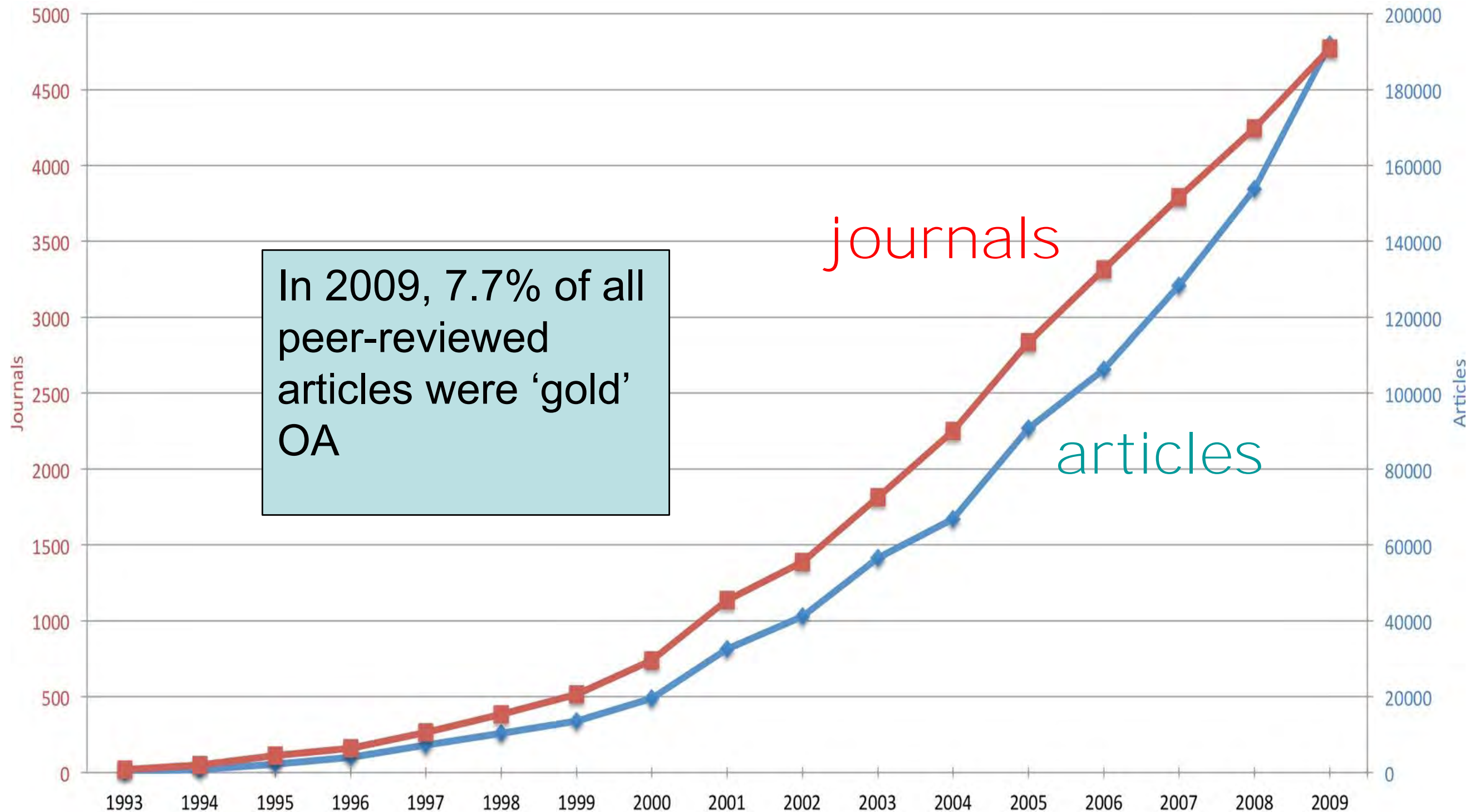


Growth in three OA publishers

(publications per year)



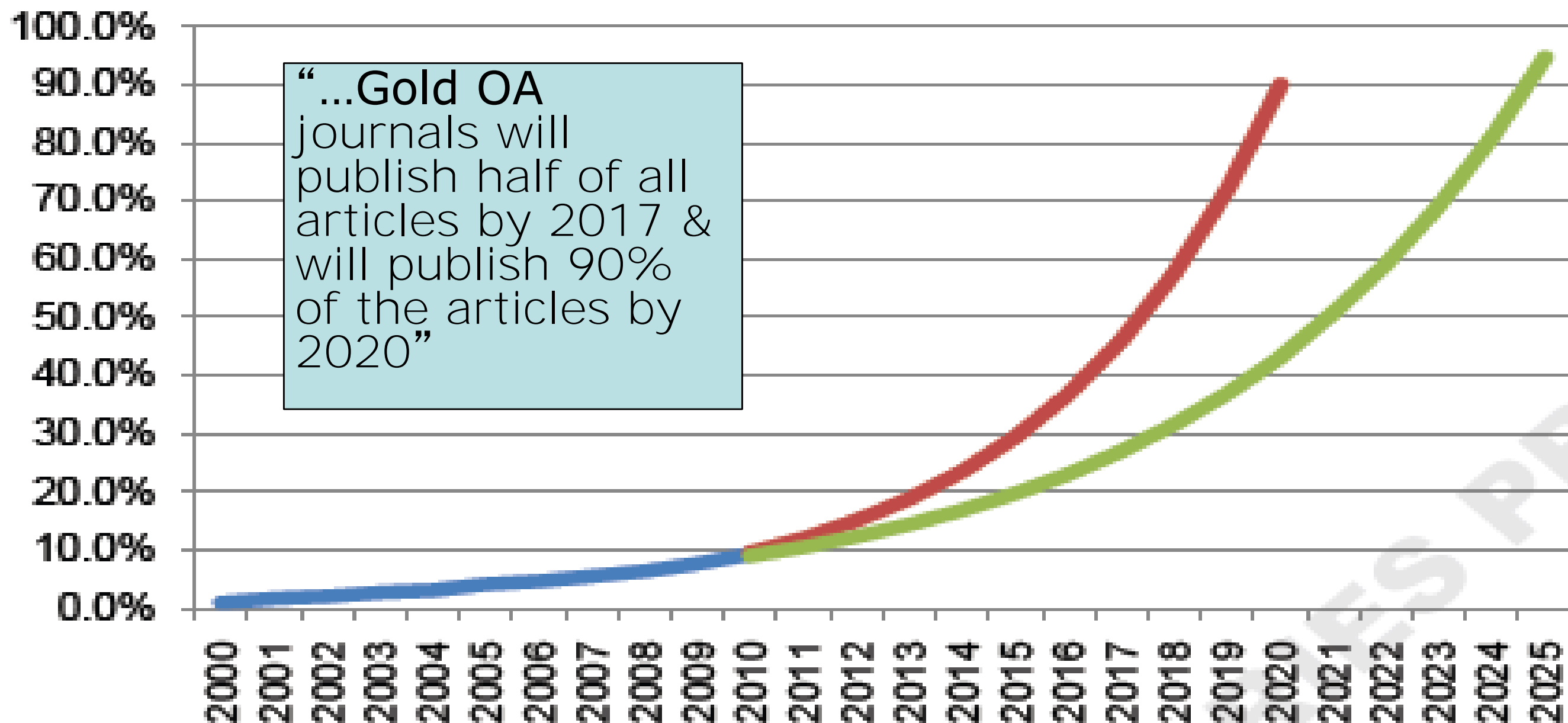
Growth of the OA Universe



Laakso M, et al. et al. (2011) **“The Development of Open Access Journal Publishing from 1993 to 2009.”** PLoS ONE 6(6): e20961. doi: 10.1371/journal.pone.0020961

“The Inevitability of Open Access”

Figure3: Pace of Substitution of Direct Gold OA for Subscription Journals (normal scale)





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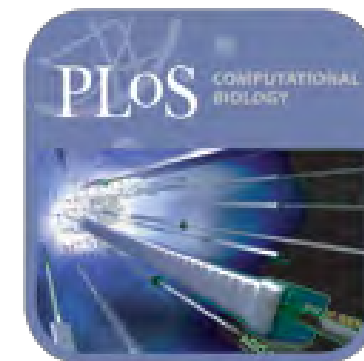
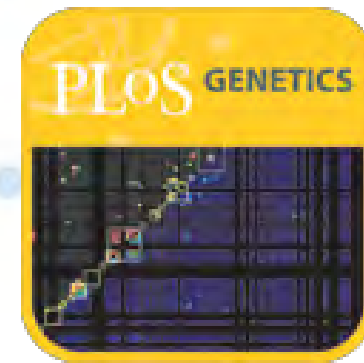
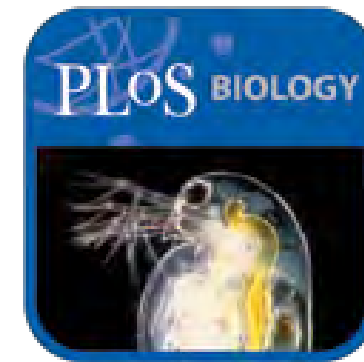
- Nine years old and the largest not-for-profit Open Access publisher
- The publisher of 7 Open Access journals including PLoS ONE
- Based in San Francisco, and Cambridge UK
- Self Sustaining since late 2010

OA Comes in Many Varieties. What is the PLoS ‘flavor’ ?

- Not for Profit organization
 - Mission driven
- Online only
 - On an Open Source publication platform
- ‘Free to submit’ but ‘pay to publish’
 - However ability to pay does **not** affect ability to publish
- Creative Commons Attribution license
 - Author retains full copyright
 - Full re-use is permitted, when credit is given
- Free to read, download, re-use

PLoS Biology
October, 2003

PLoS Medicine
October, 2004



PLoS Community Journals
June-September, 2005
& October, 2007 (NTDs)

PLoS ONE
December, 2006



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Why does PLoS ONE exist?



bengoldacre ben goldacre

oh god this is a tedious game. can someone pls send me this from JAMA? the insurmountable walls of the academy forbid bit.ly/obRz1q

1 hour ago



ShirasuLab Shirasu Lab@RIKEN

Our first paper in **PLoS** One accepted! Previously rejected by P Methods just because we use non-popular plant. Congrats, Julianne!

35 minutes ago

Pressure for positive results puts science under threat, study shows

Negative results are disappearing from most disciplines and countries

Daniele Fanelli

Scientific research may be in decline across the globe because of growing pressures to report only positive results, new analysis suggests.



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Some of the 'Features' of PLoS ONE

Covering all of Science (but mostly Biology and Medicine)

- Generally fast
- Publishing daily
- Streamlined production (no copyediting, no author proofs)
- Full color throughout (no extra charge)
- Papers of unlimited extent (no extra charge)
- Unlimited supplementary materials (no extra charge)
- Utilizes many 'Web 2.0' features (Comments, Notes, Star Ratings)
- Utilizes many web 2.0 tools (Editorial Board discussion forum; everyONE blog; Twitter; FriendFeed; Facebook)
- Encouraging of debate and commenting
- Uses the most liberal 'CC BY' copyright licence
- Operates an 'author pays' publication fee (\$1,350)

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PLOS ONE's Key Innovation – The editorial process

- Editorial criteria
 - Scientifically rigorous
 - Ethical
 - Properly reported
 - Conclusions supported by the data
- Editors and reviewers do **not** ask
 - How important is the work?
 - Which is the relevant audience?
- Use online tools to sort and filter scholarly content after publication, not before



PLOS ONE Publication Criteria

1. The study presents the results of primary scientific research
2. Results reported have not been published elsewhere
3. Experiments, statistics, and other analyses are performed to a high technical standard and are described in sufficient detail
4. Conclusions are presented in an appropriate fashion and are supported by the data
5. The article is presented in an intelligible fashion and is written in standard English
6. The research meets all applicable standards for the ethics of experimentation and research integrity
7. The article adheres to appropriate reporting guidelines and community standards for data availability

PLOS ONE – High Standards

- We aim for the highest standards in everything we do.
 - Not selecting for impact does not mean we operate a substandard or ‘lite’ publishing process
 - Ethics statements are enforced
 - Financial Disclosures are enforced
 - Open Data Sharing is enforced
 - Academic Editors are named on every paper
 - Ability to pay does NOT influence ability to publish
 - Editorial staff are blinded from any financial information
 - We do not accept papers funded by the Tobacco Industry
 - We do not accept advertising from Pharma companies
 - Wherever possible we are as transparent as possible



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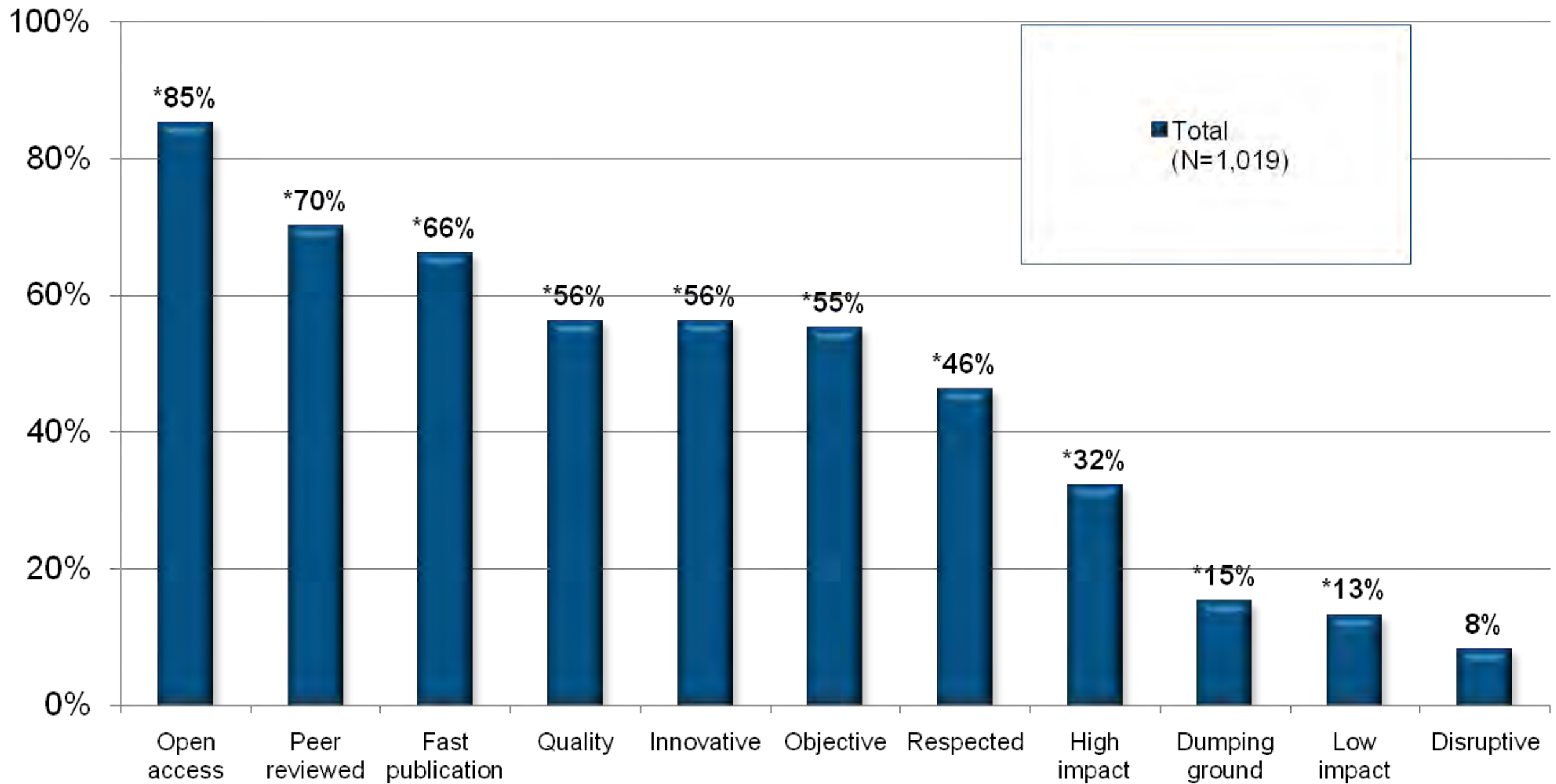
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PLOS ONE - a 'First Choice' Journal

In our survey of 2010 authors, we were

- 1st choice journal: 41% of all authors
- 1st or 2nd choice journal: 73% of all authors
- 1st, 2nd, or 3rd choice for 92% of all authors

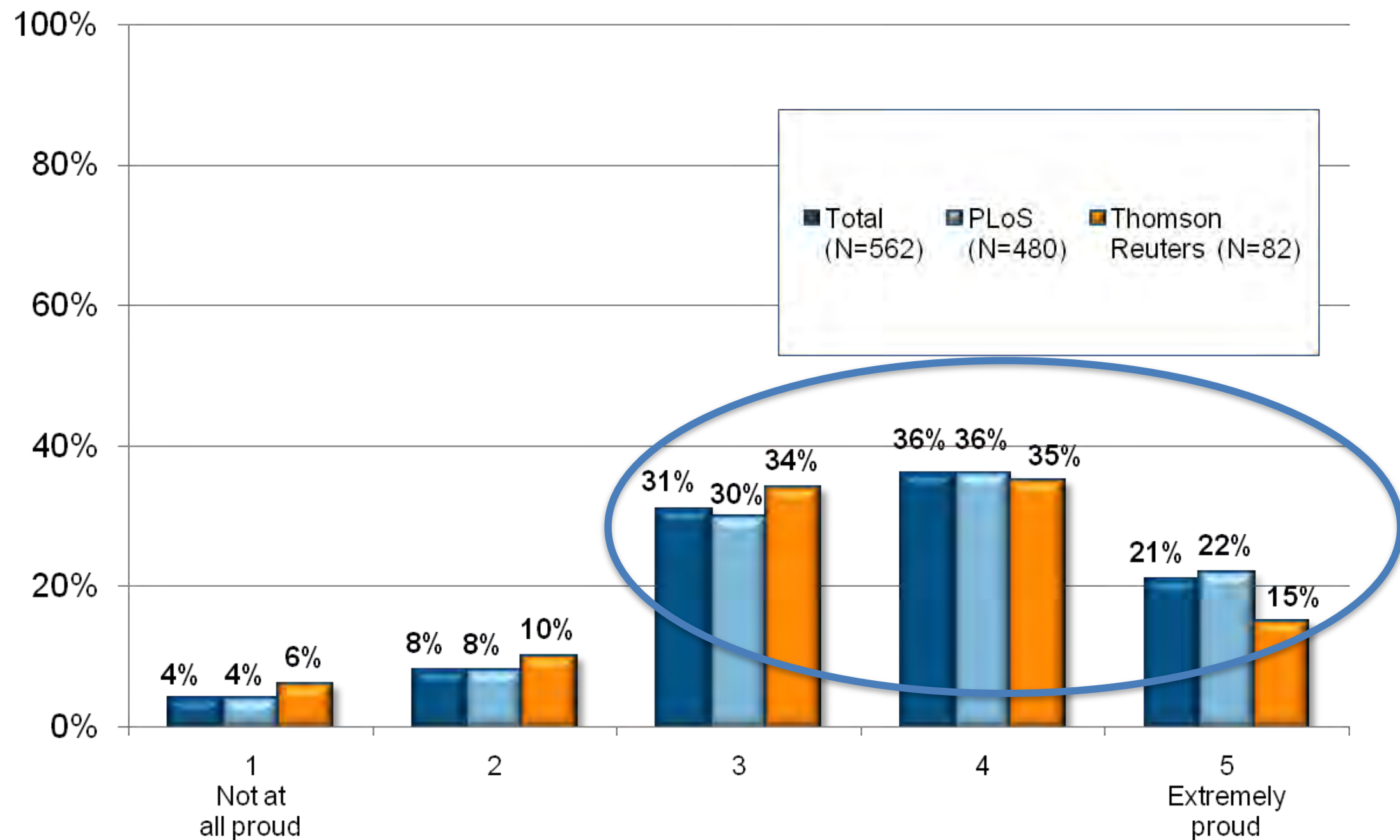
Among those familiar with PLoS ONE they see it as highly correlated with **open access**, **peer reviewed** and **fast publication**.



Q17 Top 2 Box: How well does each word or phrase fit with PLoS ONE?
(Based to those who are familiar with PLoS ONE)
Significant difference at 95% confidence level

Scale 5 = Fits extremely well, 1 = Does not fit

Among those that have published in PLoS ONE most are proud to have published there



Q12. How proud are you to have published in PLoS ONE?
(Based to those who have published in PLoS One)

*Significant difference at 95% confidence level

How would you characterize your overall experience publishing in PLoS ONE?

1 (“one of the best experiences I have ever had”)	38%
2	51% (= 89% total)
3 (acceptable)	9%
4	2%
5 (“one of the worst experiences I have ever had”)	1%



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But does Author Satisfaction translate into Success?

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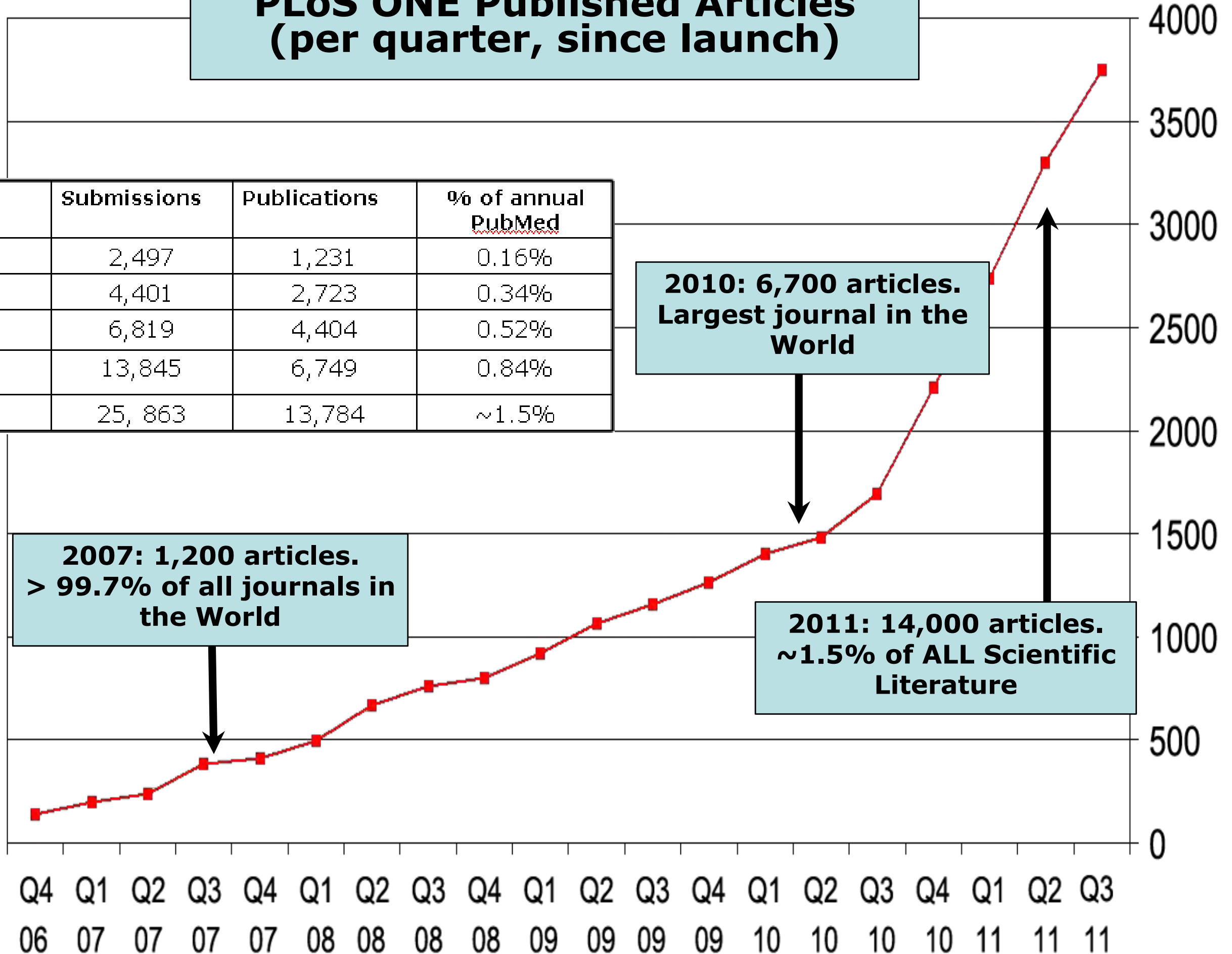
PLoS ONE Published Articles (per quarter, since launch)

Year	Submissions	Publications	% of annual PubMed
2007	2,497	1,231	0.16%
2008	4,401	2,723	0.34%
2009	6,819	4,404	0.52%
2010	13,845	6,749	0.84%
2011	25, 863	13,784	~1.5%

**2010: 6,700 articles.
Largest journal in the
World**

**2007: 1,200 articles.
> 99.7% of all journals in
the World**

**2011: 14,000 articles.
~1.5% of ALL Scientific
Literature**



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Features of OA MegaJournals

- Open Access
- Preferably multidisciplinary
- Peer-reviewed for rigour not “impact”
- Post-publication evaluation mechanisms (e.g. article-level metrics)
- Supported by publication fees
- Scalable, and can become very large

The Inherent Advantages of a MegaJournal

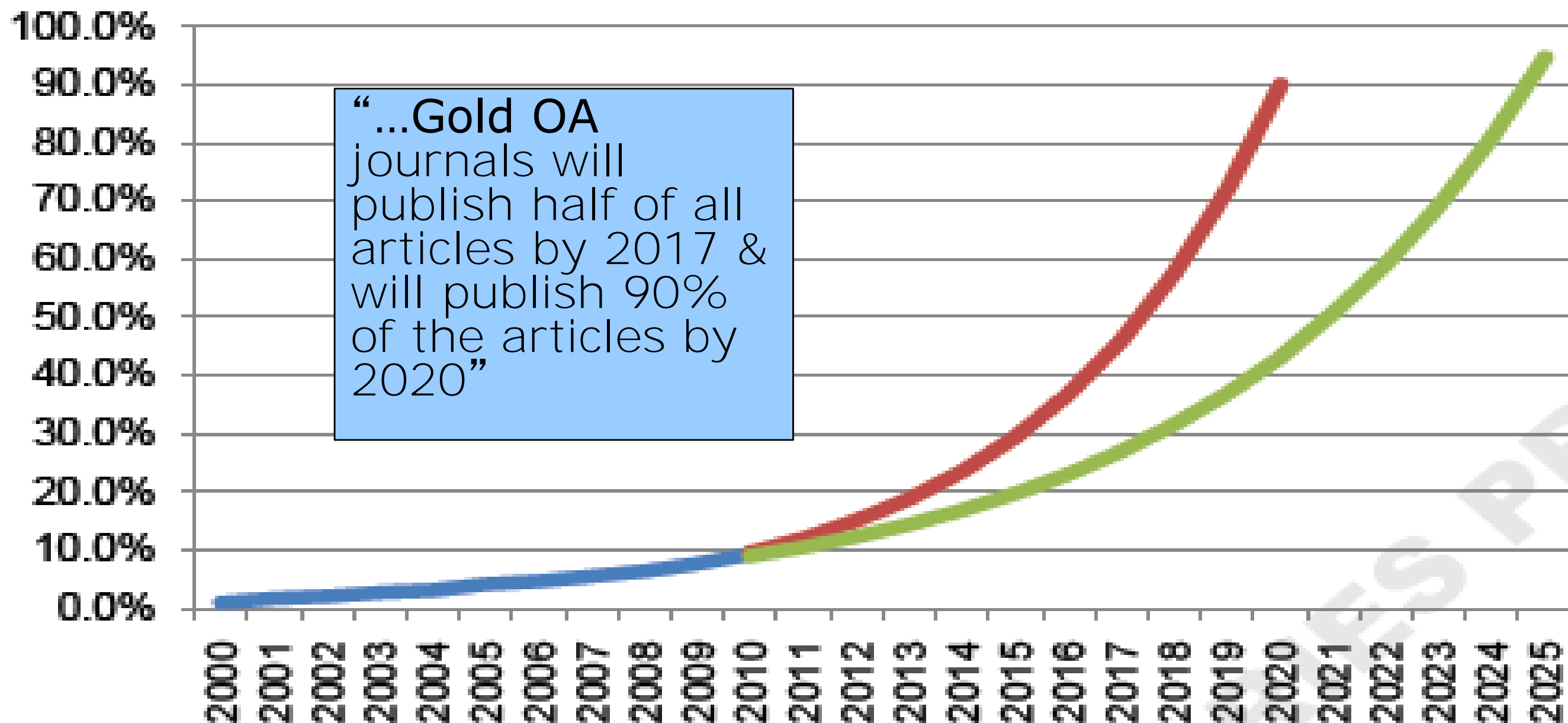
- You only need to be indexed once (e.g. MedLine, WoS)
- Authors only need to be reviewed / evaluated once
- The journal attracts high usage / high visibility
- Size encourages repeat authorship / reduces the need for ‘journal hopping’
- Many aspects of the journal can be ‘consolidated’ (e.g. one blog, one twitter stream, one marketing plan)
- Economies of scale naturally develop, making the journal more efficient
- In an Author Pays OA model, there is no economic reason for artificially limiting the size of a journal
- Subjective filtering before publication is an outdated approach to determining quality
- Provides a ‘healthier’ publishing environment for authors
- The journal has the opportunity to set consistent standards which may become de facto standards in it’s field

PLOS ONE ‘clones’

- G3 (Genetics Society of America) - \$1,650 / \$1,950
- BMJ Open - £1,200
- Scientific Reports (Nature Publishing Group) - \$1,350
- AIP Advances (American Inst Phys) - \$1,350
- Biology Open (Company of Biologists) - \$1,350
- Springer Plus - \$ 1,080
- TheScientificWorldJOURNAL (Hindawi) - \$1,000
- QScience Connect (Bloomsbury Qatar Foundation) - \$995
- SAGE Open - \$695
- A series of Taylor & Francis journals (tba in 2012)

“The Inevitability of Open Access”

Figure3: Pace of Substitution of Direct Gold OA for Subscription Journals (normal scale)





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Collectively, these will represent...

“a very large compendium of papers that have been vetted for scientific quality, but which will not be confined in terms of their likely importance.”

Harold Varmus, Oct 2005

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*“a very large compendium of papers that have been vetted for scientific quality, but which will not be confined in terms of **their likely importance.**”*

Harold Varmus, Oct 2005

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So, how could we measure ‘importance’

- Scholarly Citations
- Web usage
- Social bookmarking
- Social citations
- Community ratings
- Expert Ratings
- Media/blog coverage
- Commenting activity
- **and more...**

Current technology now makes it possible to measure many of these with ‘Article Level Metrics’



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Article-Level Metrics





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Alexander Maye¹, Chih-hao Hsieh², George Sugihara²,
Björn Brembs^{3*}

1 Universitätsklinikum Hamburg-Eppendorf, Zentrum für Experimentelle Medizin, Institut für Neurophysiologie und Pathophysiologie, Hamburg, Germany, **2** Scripps Institution of Oceanography, University of California San Diego, La Jolla, California, United States of America, **3** Freie Universität Berlin, Institut für Biologie-Neurobiologie, Berlin, Germany

Abstract

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Brains are usually described as input/output systems: they transform sensory input into motor output. However, the motor output of brains (behavior) is notoriously variable, even under identical sensory conditions. The question of whether this behavioral variability merely reflects residual deviations due to extrinsic random ¹ noise in such otherwise deterministic systems or an intrinsic, adaptive indeterminacy trait is central for the basic understanding of brain function. Instead of random noise, we find a fractal order (resembling ¹ Lévy flights) in the temporal structure of spontaneous flight maneuvers in tethered *Drosophila* fruit flies. Lévy-like probabilistic behavior patterns are evolutionarily conserved, suggesting a general neural mechanism underlying spontaneous behavior. *Drosophila* can produce these patterns endogenously, without any external cues. The fly's behavior is controlled by brain circuits which operate as a ¹ nonlinear system with unstable dynamics far from equilibrium. These findings suggest that both general models of brain function and autonomous agents ought to include biologically relevant

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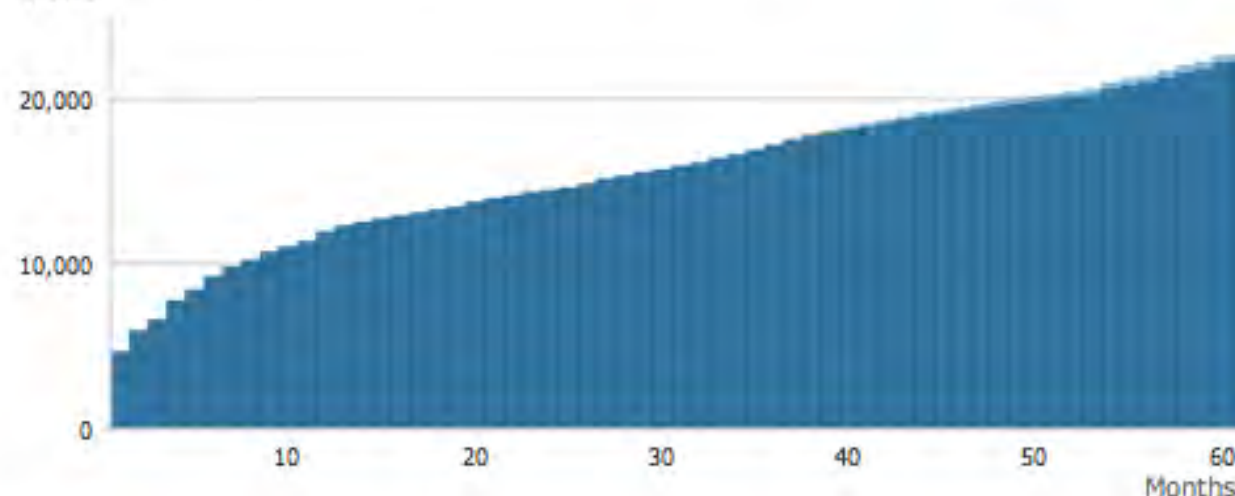
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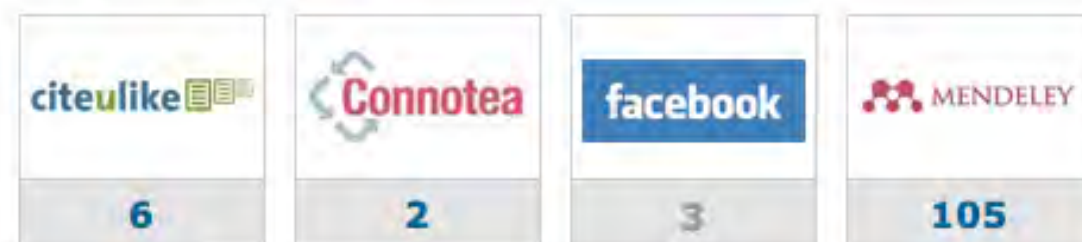
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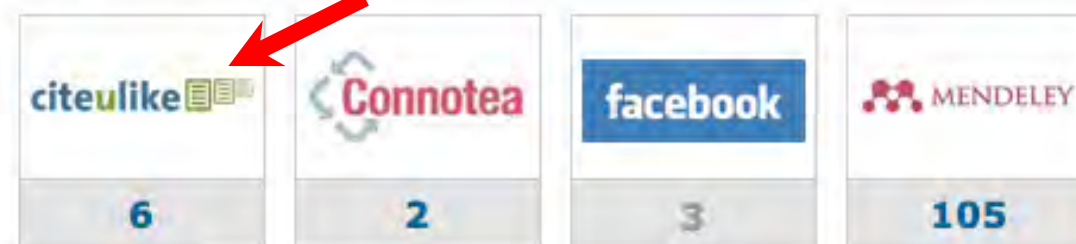
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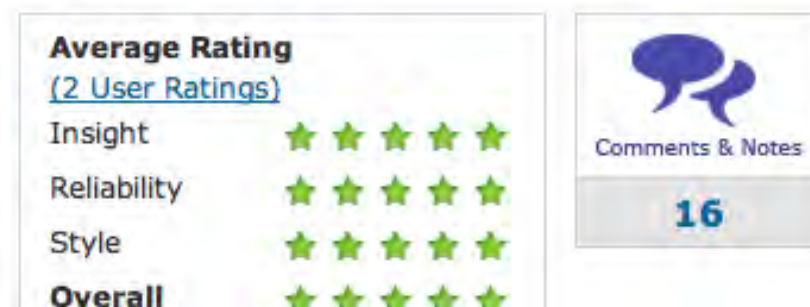
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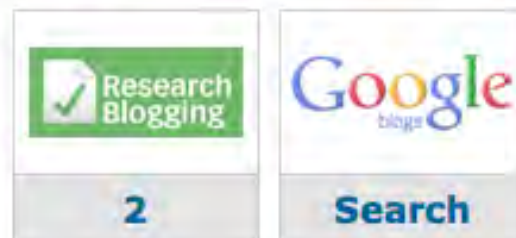
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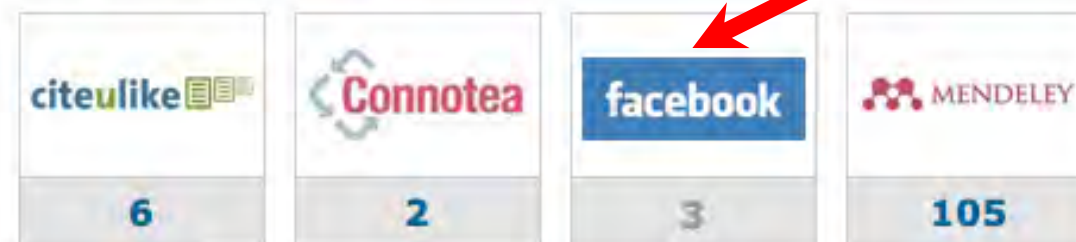
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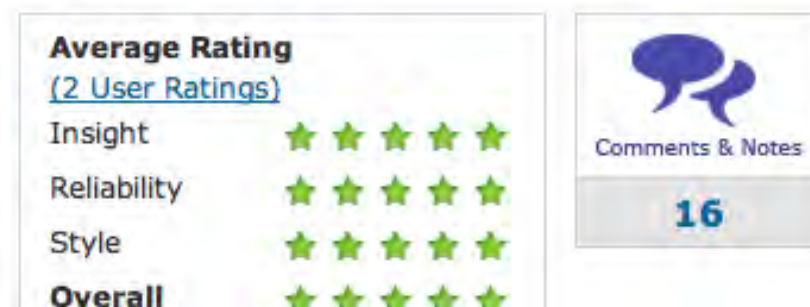
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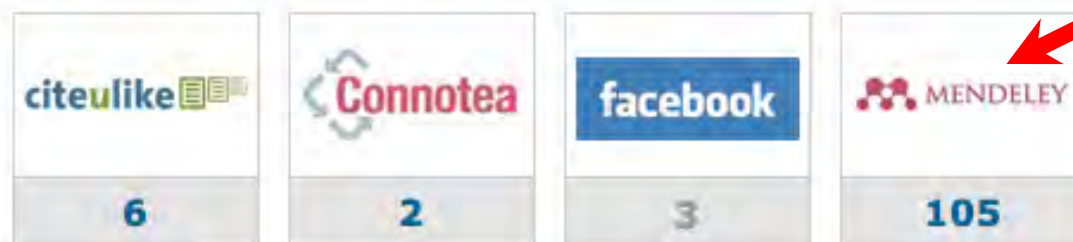
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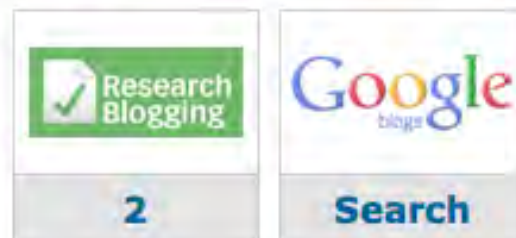
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Study 1 and 2

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Antibody to *Staphylococcus aureus* containing anti-pyruvate oxidase is unreactive when the antibody binds to the pyruvate oxidase (10). It is suggested that this is due to the antibody binding to a site on the enzyme, which is not necessary for enzyme activity. In the present study, the antibody to pyruvate oxidase was found to be unreactive to the pyruvate oxidase of *Staphylococcus aureus* (Table 1). This suggests that the antibody to pyruvate oxidase is not specific for the pyruvate oxidase of *Staphylococcus aureus* but is specific for the pyruvate oxidase of *Staphylococcus aureus* and *Staphylococcus aureus* (Table 1).

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• **STUDY TIP:** Remember that the $\frac{1}{x}$ function is the same as the x^{-1} function.

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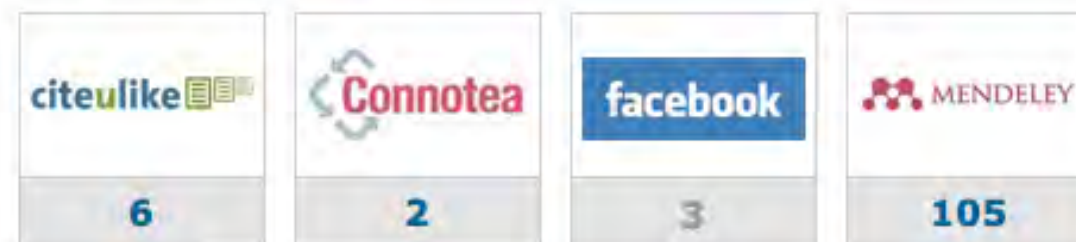
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Brains are usually described as input/output systems: they transform sensory input into motor output. However, the motor output of brains (behavior) is notoriously variable, even under identical sensory conditions. The question of whether this behavioral variability merely reflects residual deviations due to extrinsic random **1** noise in such otherwise deterministic systems or an intrinsic, adaptive indeterminacy trait is central for the basic understanding of brain function. Instead of random noise, we find a fractal order (resembling **1** Lévy flights) in the temporal structure of spontaneous flight maneuvers in tethered *Drosophila* fruit flies. Lévy-like probabilistic behavior patterns are evolutionarily conserved, suggesting a general neural mechanism underlying spontaneous behavior. *Drosophila* can produce these patterns endogenously, without any external cues. The fly's behavior is controlled by brain circuits which operate as a **1** nonlinear system with unstable dynamics far from equilibrium. These findings suggest that both general models of brain function and autonomous agents ought to include biologically relevant

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- Can we develop better tools to measure ‘impact’?
- When you are publishing 3%, 5%, 10% of the literature, are you really a journal any more?
- When we reach a point with just a few, very large, MegaJournals how will they differentiate themselves?
- And what will that future mean for the current journal ecosystem?

Summary

- Impact and technical assessment can be separated in a successful publication
- Post-publication mechanisms can be used to enhance content
- The publication landscape is on the verge of irreversible change
- Research communication (and hopefully) research itself will be accelerated



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