An open, network-based answer to the reproducibility crisis: The ScienceOpen peer review concept

American Chemical Society Fall Meeting
Boston, 16-20 August 2015
Rajeev Voleti, ScienceOpen
„Empirical evidence on expert opinion shows that it is extremely unreliable.“ John P. A. Ioannidis

*Why Most Published Research Findings Are False*, Published: PLOS Medicine, August 30, 2005 DOI: 10.1371/journal.pmed.0020124
Peer Review: How does it work?

Dr. Z

Dr. Y

Dr. X

Author

Editor

Reader

scienceOPEN.com
Complicated enough?

Peer Review Guidelines at Elsevier
http://www.elsevier.com/reviewers/reviewer-guidelines
Questions for Peer Reviewers

- Novelty / importance
- Experimental soundness
- Layout formatting typing errors
- English language
- Recommendation: Accept / Revise / Reject

“Is the article sufficiently novel and interesting to warrant publication? Does it add to the canon of knowledge? Does the article adhere to the journal's standards? Is the research question an important one? In order to determine its originality and appropriateness for the journal, it might be helpful to think of the research in terms of what percentile it is in? Is it in the top 25% of papers in this field?” Elsevier Peer Review Guidelines
Politics of selectivity

- Increase reputation of journal as measured by the **Impact Factor** (number of citations divided by number of citable articles)

Increased reputation encourages new subscriptions, prevents cancellations

Image Credit: Kai Morgener_CC-BY-NC-SA_Flickr
Peer Review is a „sacred cow“

- Publisher-driven
- Anonymous
- Closed
- Biased
- Time-consuming
- Expensive

= Higher Quality?

Paul Jump „Slay peer review ‘sacred cow’, says former BMJ chief” Times Higher Ed. Apr 21, 2015; Reporting from Royal Society’s Future of Scholarly Scientific Communication conference
Politics of openness

- With APC model there is financial advantage to publishing more
- This has lead to assumption that OA journals do not do an adequate job with Peer Review

See John Bohannon’s „Who’s afraid of peer review“ http://www.sciencemag.org/content/342/6154/60.full
What questions should we ask?

- “Publication of research articles by SpringerPlus is dependent only upon their scientific validity, comprehensibility and coherence, as judged by peer reviewers and editors. The reviewers will not be asked to assess the article for how interesting they consider it to be.”

- “Unlike many journals which attempt to use the peer review process to determine whether or not an article reaches the level of 'importance' required by a given journal, PLOS ONE uses peer review to determine whether a paper is technically sound and worthy of inclusion in the published scientific record.”
Preprints

On preprint servers you can share your article, get feedback from colleagues before submission to a „real“ journal. Is that Peer Review?
We live in a networked world...

Everywhere we are using networks to evaluate information on the web. Why not in science?

Image Credit: dee_, Flickr CC BY-NC-SA
A core ScienceOpen idea

Use the power of professional networks to evaluate scientific results.
ScienceOpen is a next generation Open Access communication platform.

- 1.6 million aggregated Open Access articles open to Post-Pub Peer Review and Collection building.
- Suite of social-networking and collaboration tools.
- ScienceOpen as Open Access publisher offers immediate publication after editorial check with a transparent, network-based peer-review afterward.
Research evaluation by researchers

We offer 2 kinds of peer review:

- Public post-publication peer review
- Pre-publication peer review by endorsement

Image Credit: Bryan Jones, Flickr, CC BY NC SA
Public Post-Publication Peer Review

- **Editorial Check:** Plagerism, basic scientific principles, basic readability, researcher check
- **Immediate publication** as PDF
- After **typesetting** open for peer review
- Peer Reviewers must have published 5 articles (**ORCID verification**)  
- Anyone in the network can invite a reviewer
- Trackable CrossRef DOI for peer review reports
The New Publishing Paradigm

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Editor

Reader

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research + publishing network

2.0

PUBLISHED
The elastic modulus of isolated polytetrafluoroethylene filaments

Authors: Patrick Drawe¹, Nils O.B. Lüttschwager¹, Martin A. Suhm*¹

Publication date: 28 April 2014

Journal: ScienceOpen Research – Section: SO-MATSCI

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DOI: 10.14293/A2199-1006.01.SOR-MATSCI.KA0J6.v1

Abstract

We report vibrational Raman spectra of small extended perfluoro-n-alkanes (CₙF₂n+2 with n = 6, 8–10, 12–14) isolated in supersonic jet expansions and use wavenumbers of longitudinal acoustic vibrations to extrapolate the elastic modulus of cold, isolated polytetrafluoroethylene filaments. The derived value E = 209(10) GPa defines an upper limit for the elastic modulus of the perfectly crystalline, non-interacting polymer at low temperatures and...
Raphael Levy evaluated the article as: ★★★☆☆

Interesting observations about the conformation of PEG molecules in mixed SAMs

Publication date: 24 March 2015
DOI: 10.14293/S2199-1006.1.SOR-MATSCI.A0Z6OM.v1.RCXLCP

Level of importance: ★★★★★☆
Level of validity: ★★★★★
Level of completeness: ★★★★★☆
Level of comprehensibility: ★★★★★☆

Competing interests: The first author, Dr Joan Comenge, is currently a Marie Curie Fellow associated with my group at the University of Liverpool. I was not however involved in any way with this work which was carried prior to him joining Liverpool.

Recommend this review: +1

Comments

The article reports on the colloidal and biochemical properties of nanoparticles capped with mixed self-assembled monolayers of an alkanethiol (MUA) and a thiolated PEG. I would tend to disagree with the authors remark (abstract first sentence) that "nanoparticles have been traditionally modified with a single monolayer" as there have been many mixed monolayers studies but they
Rating ★★★★★

**Level of importance:** Is the publication of relevance for the academic community and does it provide important insights? Does the work represent a new approach or new findings in comparison with other publications in the field?

**Level of validity:** Is the hypothesis clearly formulated? Is the argumentation stringent? Are the data sound, well-controlled and statistically significant? Is the interpretation balanced and supported by the data? Are appropriate and state-of-the-art methods used?

**Level of completeness:** Do the authors reference the appropriate scholarly context? Do the authors provide or cite all information to follow their findings or argumentation? Do they cite all relevant publications in the field?

**Level of comprehensibility:** Is the language correct and easy to understand for an academic in the field? Are the figures well displayed and captions properly described? Is the article systematically and logically organized?
Reproducibility

- Peer reviewers can check data and Materials & Methods sections, but the real test of a research paper comes when the scientific community tries to build on results.

- **ScienceOpen**: Open-ended Peer Review – interesting comments and real critique may come only later.
Pre-Publication author-led Peer Review

- After manuscript preparation authors ask two colleague „Peer Reviewers“ to **read manuscript and give feedback.**
- Peer Reviewers make suggestions for improvement and then approve the final manuscript
- Peer Reviewers sign statement and **publish their endorsement** with article
- After background check by editors, manuscript is published
- Open for **Public Post-Publication Peer Review.**
Pre-Publication author-led Peer Review

- Significantly reduced price.
- Coming to ScienceOpen in fall 2015
What aspects of **scholarly journals** are most important to users?

- Topic-specific bundling
- Editorial selection
- Quality assurance
- Trust and reliability

ScienceOpen **Collections** provide these functions beyond individual publishers or journals.
Evaluation by selection

ScienceOpen Collections: A new kind of editorial selection
A collection of recent findings in the field of Vector Biology and associated diseases.

Editors

Maiara Severo
Postdoctoral Fellow/Scientific Staff, Max-Planck Institute for Infection Biology

Editorials

Recent developments in the field of Vector Biology
Maiara Severo (corresponding)

According to the World Health Organization, vector-borne diseases account for over 17% of the global burden of infectious diseases.
Best of OA promotion: IUCr

International Union of Crystallography

This collection features a number of chemistry-related articles taken from IUCr, the new flagship open access journal.

Editorials

New editorial

IUCr celebrates its first year of publication

To coincide with the International Year of Crystallography (IYCr2014), IUCr Journals launched the comprehensive open-access journal IUCrJ in January 2014. The journal has had an excellent first year, and has already started to establish itself within the wider scientific...
In summary...

- Science needs even more publications: negative results, all clinical trials, protocols, data papers, observations. **But how to evaluate more?**

- ScienceOpen is trying some experiments for a **sustainable** evaluation of scientific results by the scientific community.
Thank you!

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CTO

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Looking forward to your visit!

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