American Chemical Society AMA: I'm Jonathan Sweedler, Professor of Chemistry at University of Illinois at Urbana-Champaign and Editor of Analytical Chemistry, here to discuss the peer review process.

AmerChemSocietyAMA [1] and r/Science AMAs[1]

[1]Affiliation not available

April 17, 2023

Abstract

Hi Reddit – I am a professor of Chemistry and also a professor in several other departments/programs including Neuroscience and Physiology, all at the University of Illinois at Urbana-Champaign. My research has two major themes: one is developing new analytical tools to characterize the chemistry occurring in small volume samples, and the second uses these tools to understand the chemistry occurring in the brain. More specifically, I study novel neurochemical pathways in a range of animal models. Perhaps more important to the suggested topic of the AMA, I am the Editor-in-Chief of the journal, Analytical Chemistry, published by the American Chemical Society. This journal receives thousands of submissions each year. With the help of a talented team of seventeen active researchers (our expert associate editors), and the thousands of peer reviewers who donate their time and expertise, we publish about one third of the submitted manuscripts. Last week was Peer Review Week and I thought it would be fun to discuss how manuscripts are selected to be published. Thus, I am here to answer your questions and have discussions on the peer review process, or on anything else you have in mind. I'll be back at 1 pm ET (10 am PT, 5 pm UTC), so AMA and I look forward to hearing your thoughts! I am online and ready to answer your questions. Thanks all for your participation. Thank you again for participating in this AMA. I hope it was a positive experience for you! Please let me know if you need anything else.

the WINNOWER

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ABSTRACT

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READ REVIEWS

WRITE A REVIEW

CORRESPONDENCE:

DATE RECEIVED:
October 07, 2015

DOI:
10.15200/winn.144413.38610

ARCHIVED:
October 06, 2015

CITATION:
AmerChemSocietyAMA , r/Science , American Chemical Society AMA: I'm Jonathan Sweedler, Professor of Chemistry at University of Illinois at Urbana-Champaign and Editor of Analytical Chemistry, here to discuss the

You say that only a third of submissions are published. What would you say is the primary reasons for not publishing the remaining submissions?

Adamworks

Great questions. Some papers are not published because they do not fit the scope of the journal. The topics of some submissions are so far removed from our scope that I have no idea why they were submitted to us. Other manuscripts have issues with their research approach, data interpretation or other flaws, and some may be technically correct but not novel. For example, a manuscript that essentially duplicates an already published study with a minor change likely will not be published.

What are your opinions about PubPeer (online discussion platform for scholarly articles) and Retraction Watch (tracking service for retracted papers)? PubPeer has been quite successful in identifying shortcomings, fundamental problems, and even questionable research practices that have led to numerous papers being withdrawn. Retraction Watch is making sure that journals and offending authors are held accountable for their falsified publications.

peer review process. A, *The Winnower* 2:e144413.38610 , 2015 , DOI: 10.15200/winn.144413.38610

The current "publish or perish" attitude in academia seems to be driving this data fabrication and result manipulation. What needs to change in the American scientific community to fight these practices? What does *Analytical Chemistry* do to ensure the peer review process reliably identifies these bad practitioners? How does (or would) *Analytical Chemistry* handle apparent data fabrication following the publication of an article?

shiruken

These are important related questions. The first questions relate to Retraction Watch and PubPeer. As a journal editor, I hope not to be involved with them. Basically, I hope our manuscripts do not have issues that require retractions or substantial changes, but it can happen. I would somewhat change your order when you state that journals and offending authors are held accountable. My job, as a journal editor, is to perform due diligence during the review and publication process, and to take appropriate actions (from investigating issues to retracting them, if necessary). If someone really falsifies data successfully, their science may make it past the peer review process and their work published. I consider this a major issue with the authors more than a failing of the journal. Failure to take action afterwards would be a journal issue. I do think that these types of communities (PubPeer and Retraction Watch) have a place in the scientific publishing process and am glad they exist. As a last comment, science is, to a large extent, self-correcting in that science that is not reproducible rapidly loses influence.

As far as your second question, you state that "the current "publish or perish" attitude in academia seems to be driving this data fabrication and result manipulation." I agree but think this is a broader issue than publish or perish. If someone's job depends on a publication (for promotion, tenure, funding or advancement in a company), there will be perceived reasons to falsify or exaggerate their results in a manuscript. The way around this is to educate scientists on ethics, be vigilant in reviewing and examining articles, encourage individuals who have concerns to report them to us, and to investigate all such claims. While Analytical Chemistry has many associate editors, I get personally involved when questions of fraud arise. I follow COPE (the Committee On Publication Ethics) guidelines in investigating such claims. I take this responsibility very seriously.

I am going to end this now but could write a lot more on these topics. Let me know if you have specific related questions.

How do you decide who should peer review what papers, or who should be a peer reviewer at all? Also, how often would a certain peer reviewer be used in a year?

Finally, ever deal with any unprofessional, malicious or sloppy peer reviewers, or are you able to weed them out before the work starts?

btpanko

Selecting good reviewers is one the most important parts of an editor's job.

Reviewers are selected from a pool of experts to independently assess the submitted work. Good reviewers should have a broad knowledge and understanding of the field, technical expertise to evaluate experiments, data and interpretation, and the ability to offer constructive, fair and unbiased opinions.

How do we select them? We ask the authors of the paper to select possible reviewers. I look at their list, and also select some reviewers not on their list. First, a critical point: I hope the authors do not suggest friends, collaborators and coworkers at the same location, or those with a conflict of interest. If I find that someone suggested a collaborator with whom they published a paper recently (discovered using a web search), I tend to discount all of their selections.

I then select other reviewers based on my reading of the manuscript. I pick names using some of the following criteria: Have they published in the field related to the manuscript's subject matter? Are they

cited in the manuscript in a meaningful way (which certainly suggests relevant expertise)? Have they reviewed for us previously, and are their reviews of high quality? The last one is information I have in a database and is an important consideration in selecting appropriate reviewers.

And to answer the last question, very occasionally, we get an unprofessional review. While my job is NOT to edit a review, I will remove malicious comments and then make a note about the reviewer in a database. Yes, I have received a review that used four letter words: not appropriate.

Has your journal ever published anything from some random person doing research on their own--for example, some Joe Schmo with a passion for chemistry?

PassengerSideDriver
This is a fun question. I really do not know who many of our submitters are, but I know their affiliations. We publish papers from researchers who list affiliations as being from medical schools, universities and companies from around the world; I do not know of anyone listing a "home" address. I know of a case where a theoretical paper was from a medical doctor who worked on his science research in his spare time without a lab.

There is a tendency by many independent movements, like PLos, arxiv, PeerJ etc... to shift from a model where a researcher submits a paper, it is editorially reviewed and peer reviewed, to a model where everybody publishes everything as fast as possible. In this system ultimately "the community" is supposed to give an opinion on the quality of the paper.

I personally look at this with a bit of suspicion, as I imagine that too much information ends up burying everything in noise, with papers ending up being cited or not due to random fluctuations in who knows what, much like kitten viral videos.

what do you expect for the future?

lucaxx85
Some of the journals you list such as PLoS One still perform peer review. I have published there and the reviews have been detailed. If you look at the above discussion, I listed reasons we would not publish a manuscript; in the case of PLoS One, they determine if the work is technically sound but do not judge significance or scope. In other words, they determine if the work is technically correct, but not if it is significant. They leave the community to judge this.

It is intriguing that at the same time these new journals attract large numbers of submissions, increasing numbers of papers are being submitted to the more exclusive journals. Thus, I believe both will continue to thrive.

I also believe citations for the better papers are driven by their content and not random fluctuations. Some work is amazing and will get many citations. If you are asking to distinguish between papers with zero and one citation, then I agree… it is random fluctuation.

What do you think will be the long-term effects of the Internet on peer-reviewed journals? Will they all become online journals? And of so, will that enable them to publish more papers that are now rejected because of space limitations?

hardman52
We are an eighty-plus year old journal, and now we are essentially only available on the internet. This frees us up from a specific number of journal pages each year. Do we publish more pages? We have increased the number of articles/pages we publish, but we are more selective now than a few years ago. In balance, we have increased our selectivity more than article numbers. Overall, I do not think

most journals want to expand in an unlimited fashion.

Do you think review can really be totally unbiased and don't you think that anonymous reviews can be, sometimes, not fair to competing research groups? Can you envision a different, more 'controllable' review process? E.g. Non anonymous reviews.

epd20
As far as anonymous reviewers for Analytical Chemistry, we are partially held to the processes that people expect. In some fields, reviewer names are included with the manuscript when it is published, and in others, this would not be acceptable. A few journals release reviewer names but also allow the reviewer to specifically request their name not to be disclosed. For these journals, most people ask that their name not be listed. In our case, if reviewers knew their name would be listed with the articles we publish, many scientists tell me that they would not review for us. Losing a large fraction of the potential reviewer pool worries me.

This journal receives thousands of submissions each year. With the help of a talented team of seventeen active researchers (our expert associate editors), and the thousands of peer reviewers who donate their time and expertise, we publish about one third of the submitted manuscripts.

So in my experience, it's extremely rare for someone to fail to get their manuscript published by *someone*. Usually they'll start with a very prestigious journal and then move down the line of impact factor ranking until they find someone who will publish.

How often do you run across manuscripts that you rejected at an ACS journal but were eventually published by someone else?

jpgray
Great question. I see this happen, but oftentimes the manuscript has been improved based on the peer review. Thus it is a similar but not identical manuscript that has been published.

Why is it so easy for science projects' results to be published where negative results are glossed over, ignored, discarded just because positive results are deemed more likely to progress a professor's career than negative ones; and because journals don't like to publish "it-didn't-work-but-it-was-a-good-shot" stories?

KroyMortlach
I hear this question often. My issue with failures is that there are a thousand reasons for a study to fail and it can be hard to figure out why a negative result is negative. Think of repairing a car; if you repair it correctly, the car runs. If you fail at any of a hundred steps, it does not. A car not running does not necessarily communicate much about the reason why.

In my group, many experiments fail until we figure out what step is causing the issues, and then we get them to succeed. Reporting failures can be misleading.

I know this is mostly confined to medicine, and I'm only aware of a few cases in which chemists were caught doing this, but if you were to locate what you believe to be possible fraudulent data, would you simply not publish, or would you forward the case to somebody else and expose the fraud?

NutritionResearch
Unfortunately, I do not think fraud is confined to a single field.

My actions depend on the type of fraud and how sure I was about the issues. Normally, you start by asking for clarification from the individual involved. If I uncovered egregious fraud, I would let the institution's Department Head or Research Integrity office know details so that they could investigate. The appropriate course of action for a publication from a company depends on the specific situation and the company.

Because I work with a publisher with staff that deal with many journals, they likely would have more experience. I would I seek advice from them on an appropriate course of action.

What do you think is the percentage of chemistry students being able to publish papers in their undergraduate career? I know that a lot of smaller universities let their undergraduates work in research laboratories.

As a follow up question, would you take undergraduates in your laboratory? If not, why?

Thank you for your time.

dashizzz08
My lab currently has seven undergraduate researchers in it. I decided on a career in chemistry because of my undergraduate research experiences and so I like many to have this opportunity.

I publish manuscripts with undergraduates as coauthors on them a few times each year; said differently, about 20% of the undergraduates who work in my lab are a co-author on a publication.

As a follow up question, would you take undergraduates in your laboratory? If not, why?

Thanks for doing this AMA! What are your thoughts on authorship? Will there ever be a standard criteria for authorship versus acknowledgments, first author versus not, etc.

jclin
Many journals list authorship guidelines, including ACS journals. That being said, what constitutes a significant contribution in a complex study and thus deserving of authorship will always be open for discussion. Lastly, the standards change depending on the field, and even geographic location.

Hi Prof. Sweedler. Thanks for taking the time do this.

First, my disclosure-- I have submitted a number of manuscripts to your journal over the years with varied experiences. The ones you've handled have been overall very positive learning experiences, fair and manageable. However other submissions with other editorial board members has resulted in less positive experiences, for example outright rejections based on a single lukewarm review.

As a result I'm somewhat hesitant to submit to your journal for fear of wasting precious time in the review process. Of course I recognized that not all manuscripts are going to get published in a good journal, but just as clearly there is variance in the editorial process which can be frustrating. Do you have any advice in these kinds of situations? Is it better to try and address this prior to submission or post-review for example?

datnuck
I hesitate to comment on a specific case involving specific editors at our journal in an open forum, although appreciate the positive comments about my handling your manuscripts. If you have specific issues with our handling of your manuscript, do not hesitate email me at the journal.

Professor Sweedler, thank you for doing this ama. I graduated from UIUC with a BS last year. I was and still am very interested in doctoral studies but decided against it because I didn't like that academia is more of a numbers game than about science and inquiry. The 2 primary "numbers" being related to publications/citations and gpa.

Can you please speak to the publish or perish culture and the weightage of gpa in admissions?

With regards to the latter, In my experience a perfect gpa has been a good signal of a slogger but not of intellect, knowledge, skill or passion...the qualities I think one needs to be a good scientist. Would you agree?

NahSoR
Congratulations on your BS from UIUC!

People like the so called quantitative measures to evaluate success… in grade school through your B.S. degree, it was grades. Grades are rarely looked at in graduate school and almost never beyond this. Publications are important, but it is the quality and impact of the papers (citations and impact, and not the number of papers) that determines success. Thus, while some play a numbers game as you describe, others are very successful with a few excellent manuscripts.