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**Author/s:**

Boerckel, JD;Plotkin, LI;Sims, NA

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Boerckel Joel (Orcid ID: 0000-0003-3126-3025)  
Plotkin Lilian (Orcid ID: 0000-0002-9537-4544)  
Sims Natalie (Orcid ID: 0000-0003-1421-8468)

## **JBMR Perspective:**

### **Editorial Peer Reviewers as Shepherds, Rather Than Gatekeepers**

**Joel D Boerckel<sup>1</sup>, Lilian I Plotkin<sup>2</sup> and Natalie A Sims<sup>3\*</sup>**

<sup>1</sup> Departments of Orthopaedic Surgery and Bioengineering, University of Pennsylvania, USA

<sup>2</sup> Department of Anatomy, Cell Biology & Physiology and Indiana Center for Musculoskeletal Health, Indiana University School of Medicine, Indianapolis, IN, USA

<sup>3</sup> St. Vincent's Institute of Medical Research and Melbourne Medical School, The University of Melbourne, Australia.

\*Corresponding Author: [nsims@svi.edu.au](mailto:nsims@svi.edu.au)

St. Vincent's Institute of Medical Research,  
9 Princes St,  
Fitzroy VIC,  
Australia

#### **Abstract**

The journals of the *American Society for Bone and Mineral Research* (the *Journal of Bone and Mineral Research (JBMR)* and its sister journal *JBMR Plus*) recognize peer review, whether pre- or post-publication, as an essential guard of scientific integrity and rigor that shapes academic discourse in our field. In this Perspective, we present a vision and philosophy of peer review in a rapidly changing publishing landscape. We emphasize the importance of journal peer reviewers as active players in shaping collegial behavior in the musculoskeletal research community and provide information about benefits and resources available for reviewers and reviewers-in-training. Publishing is becoming increasingly transparent, bringing benefits to authors, to reviewers, and to the scientific community at large. We discuss new initiatives such as transparent peer review and preprint servers, the ways they are changing scientific publishing, and how *JBMR* is responding to broaden the impact of musculoskeletal research. We emphasize the need to change any perception of peer reviewers as gatekeepers to viewing them as shepherds, who partner with authors and editors in the publishing endeavor. Promoting access, transparency and collegiality in the way we assess science in our community will elevate its quality, clarify its communication, and increase its societal impact.

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## Introduction

The progress of medical and biological sciences depends on dissemination of knowledge through publication of high-quality research. Communicating our research to one another and to the public is essential. As the most highly cited journal focused on musculoskeletal research, the *Journal of Bone and Mineral Research (JBMR)* recognizes the important role our peer reviewers play in ensuring we publish the highest quality research that is likely to be influential. As a society journals published by *American Society of Bone and Mineral Research*, JBMR, and its open-access sister journal JBMR Plus, are responsible for shaping academic discourse in our field. In this Perspective, we explore the active role of peer reviewers in shaping collegiality in the musculoskeletal research community and provide some information about resources available for reviewers and authors. We also provide some perspectives on how new initiatives such as transparent peer review, and preprint servers are changing the way we review and publish. We would like to dispel the idea of editorial peer reviewers as gatekeepers, or as bouncers at an exclusive night-club, who work to exclude and prevent publication through their critique. Instead, we encourage *JBMR* reviewers and authors to think of editorial reviewers as shepherds, working in partnership with authors and editors to ensure our published research is of high quality, and is clearly communicated.

### Peer reviewers, editors, and authors working as a team

Editorial peer review evolved in the mid-20<sup>th</sup> century when the volume of research publications increased, and research became more specialized, as a way to provide expert specialist opinion to journal Editors about whether an article is appropriate for publication (1). Its role has always been different to peer review of grant applications, where reviewers assess whether a proposal should be funded (1). At JBMR, our Editorial Team asks reviewers whether the work is rigorous, clearly and transparently presented, whether it is appropriately interpreted, whether the conclusions are supported by the data presented, and whether, in their opinion, the work is of sufficient interest for publication at *JBMR* (see guidelines at <https://www.asbmr.org/publications/jbmr-plus/guide-for-jbmrplus-reviewers>). To do this well requires a large pool of expert reviewers, from a range of specialties – endocrinologists, cell biologists, geneticists, exercise practitioners, bioengineers, surgeons, dentists, physicists, molecular biologists, and more. This ensures we publish research of a high standard. Each year, JBMR Editors consider ~900 submitted articles with the assistance of more than 600 volunteer reviewers.

Peer review has become much more than an opinion shared with an Editor. Reviewer comments are now shared with the author who is able to respond; through this, peer review became a way of improving research quality. It provides an opportunity for sharing expertise, for authors to learn how to better explain their ideas to others, to strengthen their experimental data, and to point out relevant literature they may have overlooked. Although some may view peer review as a turf war (2), we prefer to think it is a collegial act that strengthens research and builds community, particularly in the context of a society-based journal like the *JBMR*.

As reviewers and as colleagues who wish to see our field prosper and grow, we need to be both diligent and constructive in how we review. We must see peer review as a way of both producing the best papers, and encouraging each other, including the next generation of

researchers, to run well-designed experiments and to describe them with clarity. If this hasn't been achieved in the paper under consideration, we need to firmly, but kindly, explain the problem. Sometimes, just a few word changes will make it easier for authors to understand our reservations (3). In kindness to each other, we also need to be realistic in our expectations of authors, and prompt in providing our feedback. It is not the role of a reviewer to expand the scope of a study by suggesting interesting follow-up experiments, but it is the reviewer's role to provide an opinion about whether additional experiments would be required to support the conclusions.

When review comments are received at *JBMR*, the opinions of the reviewers are used by three Editors (Associate, Deputy, and Editor-in-Chief) to guide their decision-making. This provides a way to reduce bias. It also ensures any requests made by reviewers for additional work are reasonable, and comments from reviewers are communicated accurately. In this way, reviewers and editors work together to improve the content of the journal.

As authors too, we need to see reviewers as partners in the publishing process, perhaps as anonymous mentors with a critical eye. We've all seen the memes about "Reviewer 2" and know the frustration of receiving comments that are difficult to address. If a reviewer does not understand your paper, consider whether your writing, or your data presentation, is sufficiently clear. If they point out a flaw in your experimental design, reflect carefully on whether they actually have a good point. If your manuscript is declined, take the reviewers' comments on board for your next submission. Peer reviewers are the first people outside your lab who can tell you whether you have got your message across. Their comments provide an opportunity for you to improve your paper. Don't think of the reviewer as a gatekeeper, but as a shepherd, helping you shape your work into a form more clearly understood by others. This is why it's important to take time to think about who you would like to suggest as a peer reviewer for your paper. Don't just invite your conference buddies who you think might give you an easy assessment. They are professionals too, and would not want you to publish a paper that is flawed. Whose opinion do you respect and admire? Whose help would you like to enlist in improving your paper? Also consider who you should exclude; this is optional, and ideally, you should not need to exclude anyone, unless you have a known conflict with someone in the field. It is not okay to exclude everyone who works on your topic – editors need people with expertise to review your paper!

There will be times when you disagree with the assessment of the reviewers and the Editorial team. You do not have to agree with your reviewers, and you can forgo revising a particular point if you think it is not warranted; this is particularly important if an unnecessary or ill-informed experiment has been suggested. You can explain your argument against the reviewer politely in your Responses to Reviewers. It's also useful to know that if a decision to reject your paper has been tendered, and you believe this has been due to a misunderstanding, it is possible to appeal the decision. If you have valid grounds to dispute a rejection, you can write to a journal's Editor, outlining clearly and professionally that the concerns they hold can be addressed, and ask them to reconsider their decision.

### **Benefits of serving as a peer reviewer**

When the peer reviewer embraces collaborative (shepherding) vs. combative (gatekeeping), practices, the authors and the readers certainly benefit from the expert peer reviewers'

contributions. There is also value to the reviewer. Serving as a peer reviewer provides service to the community, and there are many other reasons to accept invitations to review papers. In this section, we will detail several other ways the reviewer benefits from performing this anonymous service to the community.

First, it is a unique aspect of peer-review that the reviewer is called upon to intentionally read the paper from their own perspective, as well as from the perspective of both the author and the broader audience. The responsibility of the reviewer to identify whether the work has reached a rigorous and appropriate completion, and the opportunity to strengthen the quality and clarity of the paper lead the reviewer to read the manuscript in a fundamentally unique way. This is distinct from the mode of, and reasons for, reading a paper as a researcher or as part of a journal club, where criticisms can be expressed, but cannot be addressed, and where often only a part of the paper is read in detail. Because of this unique obligation, and the requirement of attention to both detail and broader implications, we have each noticed that, as peer-reviewers, we learn from the paper differently than we do when we are simply an interested reader of a preprint or a peer-reviewed publication.

Second, though preprints are increasingly filling this need in the community (see below), peer reviewers gain early access to the newest data and ideas in the field. Clearly, attempting to preempt an idea or experiment by holding the gate closed while a reviewer pursues a similar line of inquiry is unethical, but there is a pace to science, a *zeitgeist*, and access to the cutting edge is critical to remaining current. We commend peer-review service as one important way to keep abreast of the latest ideas. Peer review also provides privileged information to the reviewer. You must consider whether you have a conflict of interest in carrying out the review. You should not be a recent co-author or collaborator of the authorship team, nor should you be in such direct competition that you are unable to assess the work without pushing your own agenda. And you should never make use of the privileged information that you access (e.g. a new research direction) until the work is in the public arena.

Third, there is both an honor and a responsibility to using one's expertise to support and advance one's field. We categorically reject the zero-sum-game vision of science, in which the success of one researcher in a given field means a loss to another. Rather, we prefer a view that "all ships rise with the tide", and the success of one researcher ought to be celebrated by others in the field for our collective benefit. Thus, as each reviewer receives a new review request, they should consider it as an opportunity to use their expertise to advance the rigor and impact of the field, and whether they have the time available to review the work carefully. If you are unable to review, please suggest an alternative reviewer, particularly if you can recommend an early-career expert in the topic or if someone you are mentoring is now ready for the task.

Finally, peer review service is often part of assessment for promotion or funding. As a service to reviewers, the *JBMR* partners with Publons, which provides a way to record, verify, and showcase contributions to peer review. It is your choice whether you reveal the content of your reviews in this system. This is a great way to formally record your peer review activity across all journals, verified, and ready for use in promotion applications and on CVs. *JBMR* and *JBMR Plus* also offer CME Credits for peer review, so your reviewing efforts can be recognized as part of your professional learning.

### **Training in peer review and improving our own skills**

The first way we learn is by example. As children, we see our parents, siblings and teachers act in a certain way, and we try to reproduce what they do. Learning to be a reviewer is no different.

The first encounter most of us have with reviews is as authors, when we receive feedback after submitting a manuscript. Through this experience, we might find ways of reviewing a paper and addressing comments that fit our style. We may also experience comments we don't like and, therefore, should not want others to receive. In other words, we learn from the reviewers of our manuscript both how to, and how not to, review a paper. Sometimes you may simply learn a more helpful way to format a review (for example, identifying page and line of the statement you are commenting on), or how to describe an issue without being disrespectful or ambiguous.

As a trainee you may also have the opportunity to help a mentor or senior investigator with a review and might receive feedback on how to review from those individuals. *JBMR* provides a space for reviewers to acknowledge, and give credit when a trainee has been involved, and always welcomes applications of new reviewers.

Most journals have specific guidelines, which provide helpful advice, particularly when it is the first time you have reviewed for it. And there are also published papers with advice (4,5). We encourage *JBMR* reviewers to make use of Wiley's reviewer resources (<https://authorservices.wiley.com/Reviewers/journal-reviewers/index.html>) and *JBMR's* guide for reviewers (<https://www.asbmr.org/publications/jbmr-plus/guide-for-jbmrplus-reviewers>).

Since opportunities to receive feedback on your review performance are rare, another excellent way to learn how to pay attention to issues and how to describe your concerns is to read the comments of the other reviewer(s) for the same article you just reviewed. These are usually sent to you when a decision is made on the manuscript by the Editor. You might see points of coincidence (which is always nice) or discover issues you had not detected, and this will lead to review your next paper with different eyes. Even the most experienced reviewers can learn more about how to review well, and as scientific practice changes, reading the review comments of others helps us all keep up to date.

A new source for training in editorial peer review has been recently developed by Publons, with the Publons Academy, a free peer review training course. This allows mentors to guide young investigators in the process of peer review. Trainees write real reviews and receive one-to-one guidance from a mentor, who will be also read the manuscript and will comment on the review.

### **The way forward: Transparent Peer Review**

Since the beginning of peer-review, the editorial peer review process has happened behind closed doors, and this means the reasons for publishing a paper are sometimes obscure. We have each said at some point during a Journal Club discussion "How did this get published?". This is one of the reasons why more and more journals are looking for means of making the review process more transparent.

*JBMR* has adopted Transparent Peer Review, where authors can opt-in to have their reviewer reports, author's responses, and the editor's decision letter linked to the accepted article when it is published. Fortunately, we have reached a stage where many journals are now adopting this process, and the benefits of this level of transparency have been argued for many years (6). In

just over one year since transparent peer review was introduced at *JBMR*, 85% of *JBMR* authors, and 90% of *JBMRPlus* authors, have opted in, allowing their peer review documents to be published in Publons, and linked to their published *JBMR* or *JBMRPlus* article. Reviewers generally remain anonymous, unless they opt-in by signing their report, and 20% of *JBMR* reviewers have opted to do that; we will discuss why you may, or may not, want to reveal your name below. The greatest benefit of Transparent Peer Review is that it provides more information to readers and authors about how editorial decisions are made, and the information used in decision-making, as well as a record of the changes made to a manuscript before publication. The reader will be able to assess whether the reviewer has made sensible criticism of the work, and may be able to understand why the paper was accepted, even though there were still limitations. In addition, publication of the review should result in reviewers being more careful with the tone of their review comments. This should increase confidence in the review of published articles. Reading published peer reviews is also a helpful way for early career researchers to learn how to, and how not to, provide and respond to reviews.

Transparent Peer Review also provides protection against “fake peer-reviews” (reviews performed by non-qualified individuals sometimes suggested by, or paid for by, the authors). Usually, an attentive editorial team is very prompt at finding such problems, as Editors carefully review the comments made by each reviewer. Fortunately, such occurrences are rare in established journals, and usually restricted to predatory journals in which a fast acceptance is desirable. Nevertheless, it is important to be aware that this practice has led to the retraction of ~489 manuscripts since 2015 (Retraction Watch Database (<http://retractiondatabase.org>)). Although *JBMR* does not publish the names of reviewers unless they opt in, making the reviewers comments publicly available makes it easier for authors and readers to detect fake peer reviews, and to alert the journal to their concerns.

Identifying the reviewers by name would provide a further level of transparency to the review process (7). However, concerns have been raised regarding potential retaliation against the reviewer when their manuscripts are under review, particularly for less-established scientists, who may feel intimidated by their identity being revealed to a more-established researcher (8). There are many reasons why a reviewer may be uncomfortable with expressing criticisms publicly, and this is respected. Ideally, collegiality should prevail, and the reviewer’s only objective should be to help science advance by making the work easier to understand. In such a circumstance, releasing their identity should not be seen as potentially damaging for the reviewer; at this stage *JBMR* leaves the decision of whether to reveal their identity to the reviewer, and does not release the identity of reviewers unless the reviewer gives explicit instruction to do so.

Some journals that have Transparent Peer Review have also established a system where discussion occurs amongst the reviewers and the journal Editor to reach a consensus on the changes required for a manuscript to be acceptable, and to clarify comments to the authors (e.g. *eLife*). This is not a policy of the *JBMR* and *JBMR Plus* journals, although discussion does occur between members of the Editorial team about article acceptance, and is very helpful in controversial decisions. As a reviewer, you can help the Editorial team in their decision-making by being specific in your brief comments to the Editors about what you think would be required for acceptance.

## Preprints are changing the publication landscape

The emergence of preprints is changing the publishing landscape. A preprint is a complete but unpublished manuscript, not yet certified by peer review, distributed by its author before, or at, submission to a journal (see <https://asapbio.org/preprint-servers>). While there are a number of preprint servers for the life sciences, the first, and most commonly used, is bioRxiv, the “server for life science preprints.” BioRxiv (pronounced “bio-AR-chive”), launched in November 2013, covers all of the life sciences, and is operated by Cold Spring Harbor Laboratory. It is a not-for-profit, is publisher-neutral, and is free to both authors and readers. MedRxiv (“med-AR-chive”), its clinical research complement, was launched more recently. A full list of preprint servers can be found here: <https://asapbio.org/preprint-servers>.

Preprints are citable manuscripts, but unlike a citation based on “personal communication” or a citation to an abstract presented at an academic meeting, preprints can be fully accessed by the reader. Preprints receive document object identifier (doi) numbers, which are mapped to the published paper following peer-review and publication. Importantly, both initial preprint submissions and edited updates receive clear time stamps. It is up to the bone and mineral research community to determine assignment of priority *vis a vis* preprint time stamp vs. peer-reviewed publication date.

*JBMR* and *JBMR Plus* do not require their authors to deposit their work to a preprint server prior to submission, but you may wish to consider doing so for several important reasons (9). Posting manuscripts to freely available preprint servers provides a benefit to the community through increased transparency, enhanced rigor, and expansion of the diversity of voices available to provide feedback and discussion prior to publication. The date-stamping of prior versions on the server (“versioning”) of preprints allows readers to see the evolution of a paper through the peer-review process. As discussed above, peer review has traditionally happened exclusively behind closed doors, and is performed only by the selected few reviewers tapped by the editor. The opportunity of the authors to solicit and incorporate feedback from the community prior to submission, or during the closed-door peer review process enhances the rigor of peer review. Broad availability of preprints increases the number and diversity of experts available to provide feedback on a paper prior to its final publication in the journal.

Posting a preprint also provides benefits to authors. First, the opportunity to disseminate research, when the authors determine it is ready, benefits early career researchers. Publications are the currency of science, and the pressure to publish is heightened by increasing time required for publication. The number of panels in elite biology journals has increased between 1984 and 2014, and the average number of supplementary panels increased from zero to between 20 and 40 (10). This is correlated with a 20% increase in the duration of time to first authored-paper, sampled from trainees in biology at UCSF (10) For graduate students and postdocs seeking fellowships or new positions, the ability to present a publicly available preprint is a more tangible way of showing their productivity than a CV-line stating “paper under review” or “in preparation”. Second, the NIH, and other national and international funding agencies encourage it. NIH policy NOT-OD-17-050 states “the NIH encourages investigators to use interim research products, such as preprints, to speed the dissemination and enhance the rigor of their work.” Preprints can be cited in the same way as any publication. The citation of preprints enables grant reviewers to inspect what the authors are comfortable

releasing as a finished product, potentially years before completion of the publication process. Third, preprinted papers are more highly-cited (approximately two-fold greater in their first three years) compared to their non-preprinted paper control cohort (11). Fourth, preprints allow the author to receive informal peer review about, write grants on, and initiate new collaborations around their latest data rather than having to wait for the completion of the formal publication process. Journal editors actively seek out and solicit posted preprints for submission. Finally, we, as a community, also benefit from the implementation of preprints as they accelerate scientific communication, expand international access (due to free open-access), and support the careers of the most vulnerable in our community: our students and early career-researchers.

Several concerns may be raised by authors or readers of preprints (9). First is the concern of being “scooped” by other researchers following posting of a preprint but during its peer review. We make several points in response to this concern: 1) the community establishes priority – this is up to us! 2) many journals provide “scoop-protection”, tied to preprint date (e.g. EMBO Journal), and 3) release of data to the community via a preprint is in many ways similar to presentation of the same data at a conference, such as the annual ASBMR meeting. We emphasize that, in the academe, scientific reputation is essential, and while peer review undoubtedly improves the rigor and quality of the published literature, authors should only post preprints to which they are prepared to assign their name and reputation. Second, for authors concerned about intellectual property and patent considerations, preprints represent a public disclosure. Therefore, authors should be aware of their plans for intellectual property prior to posting work publicly to a preprint server. Third, there may be concern among some in the community that preprints aim to supplant the role of peer-reviewed journals. Rather, these serve distinct functions. Similar to conference presentations, the preprint is an opportunity for the authors to determine the timing of dissemination and solicit feedback from the broader community on their work, but does not carry the certification of peer review. As the dynamics of the COVID-19 research dissemination has emphasized in the past year, neither preprint posting nor peer review is capable of preventing dissemination of incorrect information, particularly in the media. For this reason, we strongly encourage authors to avoid promoting their preprinted work (or conference presentations), in the popular press. It is important that the research record is as rigorous as possible, and peer-review is an important step to support accuracy in reporting and to shepherd the work through certification by expert peers.

Some life-science journals now require authors to deposit their papers at a pre-print server prior to journal submission, in a “publish, then review” model (12,13). This model sees journals as “curators” rather than publishers, leaving the decision to publish (i.e. make their work public) to the authors. “Publish, then review” has been proposed as a mechanism to de-emphasize the flawed practice of using Journal Impact Factor as a short-cut for evaluating a single paper’s value to the scientific endeavor (13). This is not the policy of the ASBMR for either JBMR or JBMR Plus; papers may be preprinted, or not. It is the author’s choice.

Preprints accelerate science, strengthen grant submissions, help early career researchers, and increase accessibility and visibility of the research.

**Concluding comments: shepherding the work through the gate**

The research publishing endeavor is continuing to evolve, with increasing openness at every stage of the process. Researchers are publicly sharing and receiving peer feedback on manuscripts prior to submission, journals are publicly releasing editorial decisions and reviewer comments at the time of publication, and reviewers have the opportunity publicly share their service records, and to identify themselves as reviewers of published works. With this increased openness, this is an ideal time for the entire process to shift firmly away from any old views of reviewers as gate-keepers and embrace the role of reviewer as a shepherd, working as part of a team with the editor to bring the authors' work through the gate of the most appropriate journal for publication.

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