Acing the peer review process

We provide some guidelines on how to write a constructive review for *Nature Computational Science*.

The peer review process is undoubtedly an important step in scientific publishing for assessing the quality and the validity of manuscripts before publication. When evaluating a paper, multiple factors come into play and need to be thoroughly analyzed by reviewers in order to determine whether the reported research is sound and meets the journal's criteria for publication. As editors, we strive to ensure that the peer review process is as thorough and fair as possible, which also depends on the remarkable service that reviewers provide to us. We therefore would like to offer some suggestions on how to write a constructive and unbiased review for *Nature Computational Science*.

When receiving a review invitation from us, please read it carefully to understand what the review entails. Our papers are often multidisciplinary, and we tend to invite experts with different backgrounds to comment on different aspects of the paper; we might make a note about this in the invitation letter. If you agree to review for us, you also agree to participate in additional review rounds of the same manuscript, as well as to be contacted by us for additional questions about your report. Please consider carefully whether or not you would be able to submit a timely review: we appreciate if you can let us know of any unexpected delays, or if it turns out that you can no longer submit a report at any point during the review process. Ultimately, this will help us to keep the authors in the loop and to take any necessary actions to make sure that we can make a timely decision on the paper. Finally, while we carefully select our reviewers, there might be some conflicts of interest between the potential reviewer and the authors that are not apparent to us: we ask you to always notify us of any factors that may affect your impartiality when assessing a research study. If you are unable to review for us, we appreciate suggestions of other experts in the field who could serve as reviewers given their expertise.

We should note that the review process is confidential, meaning that reviewers should not share information about the manuscript under consideration with others. However, we do encourage principal investigators to involve members of their research lab in the review process. In this case, we do ask for the names of these individuals to be shared with us so that they can be given appropriate credit for the review as well.

When writing a review for *Nature Computational Science*, there are different aspects in which we are particularly interested. First and foremost, we want to know whether the research is technically valid and robust: if there are any potential technical flaws in the methodology, we would certainly appreciate a description of them in detail. The manuscript should also reference previous literature appropriately; if this is not the case, it would be important to point out missing related works that the authors should consider. Comments on the importance and significance of the results for the research community are also essential: because our readership is very broad, we would like to understand whether the conclusions of the study may have a broad and practical impact to the field. We welcome suggestions for additional experiments or data that could help strengthen the paper in this direction. In addition, we would like to know whether the manuscript presents sufficient evidence for the claims put forth by the authors, and whether the text is clear and accessible to a broad readership. Comments on language issues, such as spelling or grammatical mistakes, are less critical to us — as our papers are copyedited if they are accepted for publication — unless these mistakes hinder the understanding of the presented research.

Because we are a computational journal, we are also interested in comments about the level of methodological novelty (in terms of computational and/or mathematical methods) that the manuscript brings to the field. We are mostly interested in new methodological developments, whether the study introduces a new method or repurposes/applies existing methods. In addition, data and code are essential artifacts associated with our manuscripts: we ask all reviewers to comment on the quality and validity of the data being used in the study, and we also ask at least one reviewer to check to what extent the code is reusable and the research is reproducible as part of a code peer review process.

When writing the review, we would appreciate comments on whether there are any parts of the manuscript that you feel you cannot fully assess given your expertise, in order to help us ensure that the review process covers all technical aspects of the paper. Also, it goes without saying that a review should provide constructive feedback using a respectful tone: please be polite and avoid any comments or language that can be perceived as demeaning or offensive.

Ultimately, the peer review process represents a conversation between reviewers and authors for improving the quality of the paper, and such conversations must be as clear as possible. Sometimes, we may feel that the reviewers' comments require further clarifications. In these cases, we will contact our reviewers with additional questions, in order to help us — and more importantly, the authors — to better understand the issues raised in the review reports. Similarly, if we feel that the authors did not provide enough detail in their response to the reviewers' comments, we will ask the authors for more clarifications.

It is worth noting that our journal implements a few peer review initiatives to recognize and celebrate the essential role that reviewers play in the scientific world. For instance, *Nature Computational Science* supports transparent peer review, where authors have the option to publish the review reports, authors' rebuttal and editorial decision letters upon publication of their manuscript. The goal of transparent peer review is to make our editorial decision-making process open, in addition to providing greater visibility for the amazing work that you, reviewers, do for the journal. If you agree to review for us, you also agree to the publication of your comments made to the authors. Unless you sign the report with your name in those comments, your anonymity is maintained. In addition, we also support reviewer recognition, where you can opt in for having your name added, in acknowledgement of your contribution, to the final published paper.

More detailed reviewer guidelines can be found on our website, and the guidelines that we use to assess papers can also be a useful resource when completing your review. But of course, we encourage you to get in touch with us if there are any questions throughout this process. We would also like to take this opportunity to thank all of our reviewers, who help us to ensure that the quality of our publications meet the highest standards. ❐