

What makes a *Nature Methods* paper

We explain what our editorial team looks for when considering a methods paper for publication.

Our editorial team members are often asked by potential authors about what we are looking for in a paper. Occasionally, authors express frustration that the editorial ‘triage’ or ‘desk reject’ stage, as it is referred to, feels subject to the whims of an editor or perhaps even their mood that day. However, we can assure you that we have long implemented a robust, multifactor editorial process for selecting papers to send out for peer review.

When a new manuscript arrives in our submission system, the chief editor assigns it to the team member whose expertise most closely matches the paper subject. More information about our editors and their scientific backgrounds is available on our [website](#); we also invite you to read a summary of how we handle papers in our [February 2019 Editorial](#).

No matter the field of research, there are some common elements that we always look for when judging methods paper submissions. To pass the editorial triage stage, a paper generally needs to check the boxes described below. (Note that here we focus on our Article and Brief Communication content types; other content types we publish are described in our [August 2020 Editorial](#).)

Scope

Nature Methods’ mission is to champion method and tool development research in the basic life sciences. Therefore, we consider methods papers with a primarily clinical, diagnostic or therapeutic focus to be out of scope. Methods papers in other fields such as chemistry or physics are also out of scope — unless the authors can make a strong case as to why the paper will make an impact on a broad life sciences community. If uncertain about whether a paper fits our scope, you are welcome to submit a presubmission inquiry via our [submission system](#).

Interest

Though our broad scope covers all of the basic life sciences, there are certain major fields where we are [particularly interested in publishing papers](#) — for example, single cell analysis, genomics and transcriptomics, microscopy and imaging, structural biology, proteomics, metabolomics, genome engineering, stem cell biology, neuroscience and immunology. Within these fields,

there are particular areas that represent the frontiers of methods development where we are most keen to receive papers. To learn more about what areas are piquing our interest, we invite you to read our recent [Methods to Watch](#) features, published in every January issue.

Novelty

Novelty is a key element of a *Nature Methods* paper. In a paper’s introduction, we look for a clear explanation as to why a method or tool is a substantial advance over the state of the art. We also assess the paper in the context of the peer-reviewed literature to be confident that elements of the method or a very similar approach have not been previously reported by the authors or by another lab. That is not to say that we will not consider a strong paper in an area where there are already other published similar methods — we weigh the timeliness of the topic, the practical value of the method, the performance compared to other approaches, and whether the paper makes a strong case that the method will enable new applications (more on this below). We aim to publish a mix of papers with high conceptual novelty and high immediate practical value.

Method description

We want to publish methods that will be useable by others. It should therefore go without saying that method must be described in detail. The focus on the paper should be on the method and its characterization, not on new biological findings obtained. To enable method reuse, we often require that authors describing a complex experimental workflow provide a step-by-step protocol as a supplementary item (or better yet, deposit it in a protocol repository); authors must also describe their plan to distribute any unique experimental materials. To ensure that software tools are useable, we require a detailed description of the underlying algorithms, the code (ideally hosted in a code repository and assigned a DOI), a license and a user guide.

Validation and benchmarking

Strong validation of a method’s performance is an essential ingredient of a *Nature Methods* paper. Whether an experimental approach or computational tool, authors should always take care to follow established

field standards for best practices when validating its performance.

Experimental methods should be applied to at least one well-characterized system to demonstrate that the method produces expected results. Computational tools should be validated on a ground truth or gold standard dataset if available in the field. Simulated datasets, ideally with noise added to make the data more realistic, are also useful for validation, but we nearly always also want to see tests on real experimental datasets.

If similar methods have already been published, we also expect to see some performance benchmarking. This process can be somewhat fraught, as authors do not always have the technical expertise or access required to utilize different technologies or may not be sufficiently knowledgeable about the ins and outs of running another group’s software. We rely on our expert reviewers to help us judge whether the new method has been appropriately compared to existing methods.

General applicability

We aim to publish methods that will be broadly applicable to life science researchers. Methods that are limited to studying a particular biological process may be too narrow in focus for our journal to consider. We also typically want to see data showing that good method performance is not just a one-off for a well-behaved system, but that it performs well with a diversity of systems or datasets. Just how many examples need to be shown to prove general applicability is field dependent, but two distinct applications is typically the minimum.


Challenging demonstration

Though our editorial focus is on the method itself, a ‘killer application’ can go a long way in showing readers why they should care about a method and perhaps consider adopting it in their own research. However, we are flexible about this — not every paper we publish has a killer application; it really depends on how well the paper has checked the other boxes. New biological results are not required for publication in *Nature Methods* — though it certainly doesn’t hurt. Preliminary biological findings are often okay by us as long as conclusions are not overhyped and limitations are stated.

If a paper fails to check all of these boxes, does that mean it will be desk-rejected? Not necessarily. We often will send papers missing a few key elements for peer review, but we will let the authors know as early as possible that the paper

will need some work to bring it up to our editorial standards before potential publication.

Many journals publish methods papers, but we think that our editorial standards are what makes a *Nature Methods*

paper unique. As always, we welcome your feedback about how to better serve our authors and readers. 

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