

Reporting matters



Reproducibility and replication are cornerstones of scientific research and depend on detailed reporting of experimental conditions. Here, we discuss key points and editorial policies that authors need to be aware of when submitting an article to *Nature Metabolism*.

It is important that prospective authors familiarize themselves with our general [editorial policies](#), as they will be asked to confirm that they have read and understood them when submitting a manuscript. These policies also include a specific section on [reporting standards and data availability](#), key points that we will highlight here.

Comprehensive reporting is particularly important when the experimental work is carried out in complex biological settings such as in vivo models, which are frequently used in metabolic research. Important experimental variables that we ask to be explicitly described include strains and substrains, age and sex of the animals, the time of the day when the experiment was carried out, the exact composition of diets animals were fed and details of specific interventions, such as fasting. We generally recommend that authors follow the [ARRIVE guidelines](#).

In vivo experiments also come with responsibilities regarding the ethical use and welfare of animals. Therefore, details about the ethical approval for animal experiments, including the institution(s) that granted permission, must be stated, as well as any measures taken to minimize or prevent unnecessary animal suffering, which is particularly pertinent to cancer models.

Similarly, authors of clinical or experimental studies involving humans must explicitly state who approved the study and whether informed consent was obtained from participants. Additional details and documentation that must be provided are summarized in our [editorial policies for clinical research](#).

On the more cellular and molecular side, all reagents, cell lines, microbial strains, antibodies, primers, sequences of previously unpublished genetic constructs and compositions of culture media for in vitro experiments must be provided, stating details of commercial or other sources through which reagents have been obtained.

A point that regularly comes up during peer review and that we ask to be clarified is that authors clearly distinguish between and define technical and biological replicates, the exact numbers of which must be clear for each experiment. In figures for experiments with less than 10 replicates, we ask that individual data points are displayed in scatter plots, which allows for a better illustration of biological variation (such scatter plots can still be combined with bar graphs, if authors wish to do so). Similarly, details of statistical analyses need to be provided.

The sharing of source data is a central component of open science. For large datasets, such as transcriptomics or proteomics data, our editorial policies stipulate that data must be deposited in suitable [public repositories](#) to maximize availability and reuse by the scientific community. Although not mandatory until acceptance, it is good practice to deposit your data as early as possible so that it can be vetted during peer review. A link or password that allows editors and reviewers to access such data can be added to the data

availability statement in the manuscript, but datasets must be made publicly available at acceptance. Any custom computer code or algorithms that were specifically developed for data analysis in your study should also be deposited and, thereby, shared with the community.

Additional source data, which we often request, should be uncropped, unaltered images of gels and immunoblots, unprocessed microscopy images or raw mass spectrometry data. If not already included in the manuscript, authors should have such data readily available. If a study utilizes flow cytometry, the gating strategy must be described and displayed in a Supplementary Figure.

What does this all mean in practical terms? When a paper is sent out to review, authors are requested to submit a [Reporting Summary](#). The Reporting Summary is a form used across the Nature Portfolio in which authors summarize many of the methodological details discussed above in one place. Access to this information by reviewers and editors can improve the technical assessment of a manuscript. In the event of publication, the Reporting Summary will be published alongside the paper and constitutes a useful overview for readers.

While we are aware that collecting and adding all this information to a manuscript is time-consuming, it is important to ensure reproducibility and robustness of the reported results. High reporting standards ultimately benefit the scientific community as a whole, regardless of where the manuscript ends up being published.

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