Brief guide for submission to *Nature Communications*

This guide outlines key points for preparing primary research manuscripts for submission to *Nature Communications*.

The corresponding author should be familiar with the *Nature* journals' editorial policies and is solely responsible for communicating with the journal and managing communication between coauthors. Before submission, the corresponding author ensures that all authors are included in the author list and agree with its order, and that they are aware the manuscript is to be submitted. For more information on editorial and authorship policies please review our Guide to Authors.

Cover letter

Although optional, the cover letter is an excellent opportunity to briefly discuss the context and importance of the submitted work and why it is appropriate for the journal. Please avoid repeating information that is already present in the abstract and introduction. The cover letter is not shared with the referees, and should be used to provide confidential information, such as conflicts of interest, and to declare any related work that is in press or submitted elsewhere.

Main manuscript

The *Nature* journals are flexible with regard to the format of initial submissions. Within reason, style and length will not influence consideration of a manuscript. If revisions are requested, the editor will provide detailed formatting instructions at that time. For information on length and formatting consult *Nature Communications*' content types.

Title. If possible, this should be 15 words or fewer and should not contain technical terms, abbreviations, punctuation and active verbs.

Authors. Corresponding author(s) should be identified with an asterisk.

Abstract. Provide a general introduction to the topic and a brief non-technical summary of your main results and their implication.

Text length and formatting. Attention to the following details can help expedite publication if we invite a revision after external review.

- **Articles:** an abstract of approximately 150 words, unreferenced; main text of no more than 5,000 words and 10 display items (figures, tables). As a guideline, Articles allow up to 70 references. Section headings should be used and subheadings should appear in 'Results' and 'Methods'.

Methods. The Methods section appears in all online original research articles and should contain all elements necessary for interpretation and replication of the results. Methods should be written as concisely as possible and typically do not exceed 3,000 words but may be longer if necessary. We encourage you to deposit any step-by-step protocols used in your study in Protocol Exchange, an open resource maintained by NPG. These protocols are linked to the Methods section upon publication.

References. These may only contain citations and should list only one publication with each number. Include the title of the cited article or dataset.

Acknowledgements (optional). Keep acknowledgements brief and do not include thanks to anonymous referees or editors, or effusive comments. Grant or contribution numbers may be acknowledged.

Author contributions. You must include a statement that specifies the individual contributions of each co-author. For example: "A.P.M. 'contributed' Y and Z; B.T.R. 'contributed' Y," etc. See our authorship policies for more details.

Competing interests. Submission of a competing interests statement is required for all content of the journal.

Materials & Correspondence. Indicate the author(s) to whom correspondence and material requests should be addressed.

Tables. Each table should be prepared using the Table menu in Word or the table environment in TeX/LaTeX and accompanied by a short title sentence describing what the table shows. Further details can be included as footnotes to the table.

Figures

High-resolution image files are not required at initial submission, but please ensure that images are of sufficient resolution for referees to properly assess the data.

Should your manuscript be accepted, you will receive more extensive instructions for final submission of display items. However, some guidelines for final figure preparation are included below and here if you wish to minimize later revisions and possible delays.

- Provide images in RGB color and at 300 dpi or higher resolution.
- Use the same typeface (Arial or Helvetica) for all figures. Use symbol font for Greek letters.
- Use distinct colors with comparable visibility and avoid the use of red and green for contrast. Recoloring primary data, such as fluorescence images, to color-safe combinations such as green and magenta or other accessible color palettes is strongly encouraged. Use of the rainbow color scale should be avoided.
- Figures are best prepared at the size you would expect them to appear in print. At this size, the optimum font size is between 5pt and 8pt.
- We prefer vector files with editable layers. Acceptable formats are: .ai, .eps, .pdf, .ps and .svg for fully editable vector-based art; layered .psd and .tif for editable layered art; .psd, .tif, .png and .jpg for bitmap images; .ppt if fully editable and without styling effects; ChemDraw (.cdx) for chemical structures.
- Please use the Nature Research Chemical Structures Guide and ChemDraw template for formatting of chemical structures.

Figure legends should be <350 words each. They should begin with a brief title sentence for the whole figure and continue with a short statement of what is depicted in the figure, not the results (or data) of the experiment or the methods used. Legends should be detailed enough so that each figure and caption can, as far as possible, be understood in isolation from the main text.

Statistical information

Comprehensive information on the statistical analyses used must be included in the paper. The Methods must include a statistics section where you describe the statistical tests used and whether they were one- or two-tailed. Please ensure that the error bars are defined throughout the figures. For all statistics (including error bars), provide the EXACT n values used to calculate the statistics (reporting individual values rather than a range if n varied among experiments). For representative results, report the number of times that the measurements were repeated. Where relevant, provide exact values for both significant and non-significant P values. For ANOVAs, provide F values and degrees of freedom. For t-tests, provide t-values and degrees of freedom. Please specifically define the replicates.

Supplementary information

Please submit supplementary figures, small tables and text as a single combined PDF document. Tables longer than one page should be provided as an Excel or similar file type. For optimal quality video files please use H.264 encoding, the standard aspect ratio of 16:9 (4:3 is second best) and do not compress the video. We encourage submission of step-by-step synthesis procedures for chemical compounds and data on compound characterization. Supplementary information is not copy-edited, so please ensure that it is clearly and succinctly presented, and that the style and terminology conform to the rest of the manuscript.

Data availability

Please provide a data availability statement as a separate section after the Methods section but before the References, under the heading "Data Availability"; detailed guidance can be found in our data availability and data citations policy. Certain data types must be deposited in an appropriate public structured data depository (details are available here) and the accession number(s) provided in the manuscript. Full access is required at publication. Should full access to data be required for peer review, authors must provide it.

We encourage provision of other source data in unstructured public depositories such as Dryad or figshare, or as supplementary information. To maximize data reuse, we encourage publication of detailed descriptions of datasets in *Scientific Data*.

Crystallographic data

Manuscripts reporting new crystallographic structures of small molecules must be accompanied by a standard .cif file. A structural figure with probability ellipsoids should be included in the main supplementary information file. The structure factors for each structure should also be submitted, preferably embedded in the main .cif file, although they may be provided as a separate .hkl and/or .fcf file. Use of the latest version of the program SHELXL, which embeds the structure factors information in the main .cif file, is encouraged. The structure factors and structural output must be checked using IUCr's CheckCIF routine and a pdf copy of the output supplied, explaining any A- or B-level alerts.

Computer code

Any previously unreported custom computer code used to generate results reported in the manuscript that are central to the main claims must be made available to editors and reviewers upon request. Any practical issues preventing code sharing will be evaluated by the editors who reserve the right to decline the manuscript if important code is unavailable. At publication, Nature journals consider it best practice to release custom computer code in a way that allows readers to repeat the published results.

Authors of such research papers will also be asked to fill out a code and software submission checklist that will be made available to editors and reviewers during manuscript assessment. The aim is to make studies that use such code more reliable by ensuring that all relevant documentation is available and by facilitating testing of software by the reviewers. Further detailed guidance and required documentation at submission and acceptance of the manuscript can be found here.

For all studies using custom code that is deemed central to the conclusions, a statement must be included under the heading "Code availability", indicating whether and how the code can be accessed, including any restrictions to access. Code availability statements should be provided as a separate section after the data availability statement but before the References.

Reporting guidelines

To improve the transparency of reporting and the reproducibility of published results, authors of life sciences, behavioural & social sciences and ecological, evolutionary & environmental sciences research articles must provide a completed reporting summary that will be made available to editors and reviewers during manuscript assessment. The reporting summary will be published with all accepted manuscripts. Guidance and resources related to the use and reporting of statistics are available here.

All authors must also complete an editorial policy checklist to ensure compliance with Nature Research editorial policies.

Please note: because of the advanced features used in these forms, you must use Adobe Reader to open the documents and fill them out, instead of opening them in a web browser.

Other reporting checklist

To improve the transparency of reporting and the reproducibility of published results in certain other research areas, you may be asked to complete a different checklist and provide the requested information prior to peer review.

Source data

For relevant manuscripts, we may request a source data file in Microsoft Excel format or a zipped folder. The source data file should, as a minimum, contain the raw data underlying any graphs and charts, and uncropped versions of any gels or blots presented in the figures. Within the source data file, each figure or table (in the main manuscript and in the Supplementary Information) containing relevant data should be represented by a single sheet in an Excel document, or a single .txt file or other file type in a zipped folder. Blot and gel images should be pasted in and labelled with the relevant panel and identifying information such as the antibody used. We also encourage authors to include any other types of raw data that may be appropriate. An example source data file is available demonstrating the correct format.

Human subject data

If you are reporting phase II or phase III randomized controlled trials you must refer to the CONSORT Statement for recommendations to facilitate the complete and transparent reporting of trial findings. Reports that do not conform to the CONSORT guidelines may need to be revised before peer review.

We encourage authors reporting prognostic studies with tumor markers to follow the REMARK reporting guidelines.

Before the start of patient enrollment prospective clinical trials must be registered in www.clinicaltrials.gov or a similar public repository that matches ISMJE criteria and the trial registration number reported in the manuscript. (Trials in which the primary goal is to determine pharmacokinetics are exempt.)

For describing human biospecimens, we recommend referring to the BRISQ reporting guidelines and ensuring at least Tier 1 characteristics are provided (doi: 10.1002/cncy.20147).

Related manuscripts

It is a requirement of submission that you alert us to any related manuscripts with overlapping authorship that are under consideration (including under appeal) or in press at other journals (see our editorial policies on duplicate submissions for details). Copies of these manuscripts should be clearly marked and included as separate files with your submission. Abstracts or other unrefereed preprints do not compromise novelty.

Preprint servers

Nature Research journals support posting of primary research manuscripts on community preprint servers such as arXiv and bioRxiv. We do, however, ask you to respect our policies on posting, citation and licensing of preprints.

Transparent peer review

For published original research articles, the reviewer comments to the authors and the author rebuttal letters of revised versions are published online as a supplementary "peer review file". Authors may opt out of this scheme at the completion of the peer review process, before the paper is accepted. If the manuscript was transferred to us from another Nature journal, we will not publish reviewer reports or author rebuttals of versions of the manuscript under consideration at the originating Nature journal. For more information, please refer to our FAQ page.

Reviewer information

In recognition of the time and expertise our reviewers provide to *Nature Communications'* editorial process, as of November, 2018, we formally acknowledge their contribution to the external peer review of articles published in the journal. All peer-reviewed content will carry an anonymous statement of peer reviewer acknowledgement, and for those reviewers who give their consent, we will publish their names alongside the published article. We will continue to publish peer reviewer reports where authors opt in to our separate transparent peer review scheme. In cases where authors opt in to publication of peer reviewer comments and reviewers opt in to being named, we will not link a reviewer's name to their report unless they choose to sign their comments to the author with their name. For more information, please refer to our FAQ page.

Double-blind peer review

To participate in double-blind peer review, please prepare your manuscript in a way that conceals the identities of all the authors (see checklist) and tick the appropriate box during online submission. Please note that editors do not ensure that the paper is properly anonymized; that is the responsibility of the authors.

Transferring your manuscript

If an editor is unable to offer publication of your manuscript, you have the opportunity to transfer all manuscript materials, the decision letter and any referee comments to a selection of Springer Nature journals without re-entering submission information. Use the link in your decision letter to explore suggested alternative journals. You may then initiate the transfer process to the journal of your choice or submit elsewhere. Please see this page for more information.

Appeals

Authors who feel that they have strong grounds for appealing a decision may contact the journal to request the opening of an appeal, after which they may upload a cogently argued rebuttal letter that addresses the referees' and/or editor's comments in a point-by-point manner. Decisions are reversed on appeal only if the editors are convinced that

the original decision was made in error, or if critical new information or data has been added.

Comments on published articles

Important scientific comments and clarifications on content published in *Nature Communications* may be submitted as Correspondence.

Questions and manuscript submission

General editorial enquiries should be addressed to the Editor at naturecommunications@nature.com. Manuscripts should be submitted through our online submission system. Further submission details are available here.

Open access

As of January 2016, the journal only publishes open access content, and legacy subscription content published in Nature Communications prior to 2016 has been made freely accessible. All articles are published under a CC BY license (Creative Commons Attribution 4.0 International License). We offer APC waivers for papers whose corresponding authors are based in the world's lowest income countries as defined by the World Bank. Discretionary APC waivers for authors will be considered on a case-by-case basis, and may be granted in cases of financial need. All applications for discretionary APC waivers should be made at the point of manuscript submission; requests made during the review process or after acceptance will not be considered. To request a waiver please contact apcwaivers@springernature.com. Full details of our APC waiver and discount policies can be found here.