This guide is available at http://www.cell.com/star-authors-guide and is aimed at authors publishing in a Cell Press journal other than *Cell*. If you are publishing in *Cell*, please use the *Cell* version available here. Please contact cpmethods@cell.com with any questions.

STAR Methods guide for authors

Cell Press has replaced the experimental procedures and supplemental experimental procedures sections with **STAR Methods (Structured, Transparent, Accessible Reporting)** in our life sciences journals, as well as *iScience*.

The STAR Methods section is structured with five headings (in all caps below) and a key resources table that summarizes the critical materials and resources used in the manuscript. There is no word limit.

The STAR Methods section is typeset and included with the main text online and in the online PDF. It is, however, not copyedited. The print-only PDF will summarize the STAR Methods section in an outline that is automatically generated from the section's headings and first-level subheadings. Authors do not need to submit the outline; it will be created by our production team and included with the page proofs for review.

The STAR Methods format is required for acceptance. It is not required for initial submission, but it is encouraged. For examples of the format, please refer to the most current issue of the journal to which you're submitting.

The STAR Methods guide includes three main components:

I. **General instructions** designed to assist authors as they prepare the STAR Methods text and key resources table.

II. A **final file checklist** that aims to clarify how an article's content should be organized when final files are uploaded to Editorial Manager.

III. The **STAR Methods reference sheet**, a checklist of key points that editors will check during the review of a manuscript.

I. General instructions: STAR Methods text

The STAR Methods section should be included in the same Word document as the main text. The section should be introduced after the figure legends.

Please report your methods with sufficient detail so readers do not need to refer to other papers to understand how procedures were performed. Citations of previous publications are allowed but should not be used as a substitute for providing the details of a procedure.

References cited in the STAR Methods section must be included in the main references list. Supplemental references should appear in a separate list in the supplemental PDF. References are not included in the manuscript word count limits.

Please note that the STAR Methods should not contain figures (aside from chemical reaction schemes) or tables that are complex or numbered. All other items should be included as part of the supplemental information. If you are unsure if an item can appear in the STAR Methods, please consult the journal's editorial team.

The STAR Methods text is organized into five standard headings (and the first of these includes three mandatory subheadings). To specify the types of experiments and analyses used, authors are encouraged to further organize the text by adding up to two levels of subheadings under each heading.

Please note:

(1) The five standard headings and the first level of author-added subheadings are used to populate the outline of the STAR Methods section that appears before the references in the article.
(2) Author-added subheadings should be clear and concise and are limited to 45 characters.
(3) Subheadings should not be numbered.
(4) Please format each level of subheading with a typeface that is different from the body text and the other subheadings.

RESOURCE AVAILABILITY

There are three subheadings required in this section: lead contact, materials availability, and data and code availability.

Lead contact

In this section, authors are required to designate a lead contact, who will be responsible for communication with the journal before and after publication and is the arbiter of disputes, including concerns related to reagents or resource sharing. Authors must be willing to distribute all materials, datasets, and protocols used in the manuscript. The lead contact, as designated in the author list, holds responsibility for responding to requests and providing information regarding reagents and resource sharing. Additional information on the responsibilities of lead contact is available on each journal's information for authors page. If it is uncertain that the lead contact will be able to manage this long-term responsibility, please contact your handling editor to discuss.

Lead contact example text

- Further information and requests for resources and reagents should be directed to and will be fulfilled by the lead contact, Jane Doe (janedoe@qwerty.com).

Materials availability

This section must include a "materials availability statement" describing the availability of newly generated materials associated with the paper, including any conditions for access. In cases where there are restrictions for distribution of materials, we require written explanation of the restriction (i.e., MTA). For ease of distribution, we encourage the use of repositories (e.g., Addgene, Jackson Labs, American Type Culture Collection, etc.). Newly generated items should be also listed in the key resources table, where the source should be stated as "this manuscript."

Materials availability statement examples

- Plasmids generated in this study have been deposited to [Addgene, name and catalog number or unique identifier].
- Mouse lines generated in this study have been deposited to [the Knockout Mouse Project (KOMP), name and catalog number or unique identifier].
- This study did not generate new unique reagents.
- There are restrictions to the availability of [reagent] due to [reason why restrictions exist].

Data and code availability

Cell Press authors must be willing to share all of the data and original code reported in published papers unless there is a countervailing legal or ethical prohibition (e.g., the data are confidential medical records).

Cell Press has specific requirements for datatypes that have community-endorsed, datatype-specific repositories. We call these datatypes "standardized datatypes." A list of datatypes considered standardized under Cell Press policy, with recommended repositories, is available here.

All datasets that are composed of standardized datatypes and reported in Cell Press papers must be deposited in a datatype-specific, Cell Press-recommended repository before a paper is accepted for publication. The datasets' accession number(s) or unique, permanent identifier(s) must be reported in the key resources table. Any embargo must be lifted by the paper's publication date, and the deposited datasets must be publicly accessible unless there is a countervailing legal or ethical prohibition.

All other datatypes must either be deposited in a general-purpose repository and publicly accessible as of the paper's publication date or shared by the lead contact upon request after publication. A list of general-purpose repositories that are recommended by Cell Press is available here.

All original code must be deposited in a repository that mints DOIs or included in the supplemental information before a paper is accepted for publication. If the code is deposited, its DOI must be reported in the key resources table. Any embargo must be lifted by the paper's publication date, and the deposited code must be publicly accessible. A list of general-purpose repositories that are recommended by Cell Press is available here.

Authors must include a comprehensive and accurate "data and code availability statement" within the "resource availability" section of the STAR Methods. This statement is structured and consists of three bulleted sections. Each section must be present. In total, the three sections describe the steps that have been taken or will be taken to ensure that the datasets and original code reported in the study are available after publication. An example is below, and detailed instructions for each section follow.

Example of a complete "data and code availability statement," containing all three sections:

Data and code availability

- Single-cell RNA-seq data have been deposited at GEO and are publicly available as of the date of publication. Accession numbers are listed in the key resources table. Original western blot images have been deposited at Mendeley and are publicly available as of the date of publication. The DOI is listed in the key resources table. Microscopy data reported in this paper will be shared by the lead contact upon request.
- All original code has been deposited at Zenodo and is publicly available as of the date of publication. DOIs are listed in the key resources table.
- Any additional information required to reanalyze the data reported in this paper is available from the lead contact upon request.

Instructions for section 1: Data

The statements below may be used in any number or combination, but at least one must be present. They can be edited to suit your circumstance. Please ensure that all datatypes reported in your paper are represented in section 1.

• [Standardized datatype] data have been deposited at [datatype-specific repository] and are publicly available as of the date of publication. Accession numbers are listed in the key resources table.

• [Adjective] data have been deposited at [general-purpose repository] and are publicly available as of the date of publication. DOIs are listed in the key resources table.

• [De-identified human/patient standardized datatype] data have been deposited at [datatype-specific repository]. They are publicly available as of the date of publication until [date or delete "until"]. Accession numbers are listed in the key resources table.

• [De-identified human/patient standardized datatype] data have been deposited at [datatype-specific repository], and accession numbers are listed in the key resources table. They are available upon request until [date or delete "until"] if access is granted. To request access, contact [insert name of governing body and instructions for requesting access]. [Insert the following when applicable] In addition, [summary statistics describing these data/processed datasets derived from these data] have been deposited at [datatype-specific repository] and are

publicly available as of the date of publication. These accession numbers are also listed in the key resources table.

• Raw [standardized datatype] data derived from human samples have been deposited at [datatype-specific repository], and accession numbers are listed in the key resources table. Local law prohibits depositing raw [standardized datatype] datasets derived from human samples outside of the country of origin. Prior to publication, the authors officially requested that the raw [adjective] datasets reported in this paper be made publicly accessible. To request access, contact [insert name of governing body and instructions for requesting access]. [Insert the following when applicable] In addition, [summary statistics describing these data/processed datasets derived from these data] have been deposited at [datatype-specific repository] and are publicly available as of the date of publication. These accession numbers are also listed in the key resources table.

• The [adjective] data reported in this study cannot be deposited in a public repository because [reason]. To request access, contact [insert name of governing body and instructions for requesting access]. [Insert the following when applicable] In addition, [summary statistics describing these data/processed datasets derived from these data] have been deposited at [datatype-specific or general-purpose repository] and are publicly available as of the date of publication. [Accession numbers or DOIs] are listed in the key resources table.

• This paper analyzes existing, publicly available data. These accession numbers for the datasets are listed in the key resources table.

• [Adjective or all] data reported in this paper will be shared by the lead contact upon request.

Instructions for section 2: Code

The statements below may be used in any number or combination, but at least one must be present. They can be edited to suit your circumstance.

• All original code has been deposited at [repository] and is publicly available as of the date of publication. DOIs are listed in the key resources table.

• All original code is available in this paper's supplemental information.

• This paper does not report original code.

Instructions for section 3:

Section 3 consists of the following statement: Any additional information required to reanalyze the data reported in this paper is available from the lead contact upon request.

EXPERIMENTAL MODEL AND SUBJECT DETAILS

**Please omit this section if your study does not use experimental models typical in the life sciences (e.g., if your study is computational or physical science research). This section should also include information related to cell lines/strains used for in vitro experiments.*

Please list here under separate headings all of the experimental models (animals, human subjects, plants, microbe strains, cell lines, primary cell cultures) used in the study. For each model, provide information related to their species, maintenance, and care. In cases where this is appropriate, the influence (or association) of sex, gender, or both on the results of the study must be reported.

For in vivo animal studies, reporting of the sex and age/developmental stage of the subjects is required. If there are technical or scientific reasons why sex/gender and age/developmental stage cannot be reported, a statement must be provided to disclose this and the reasons why. We also ask authors to provide details recommended by ARRIVE guidelines. This includes the available and detailed information related to the species, strain and backcrossing status, developmental stage, weight, genotype,

health/immune status, drug or test naive, previous procedures, housing, and husbandry. Please note here if the animals were kept under specific conditions (e.g., single/group housed, specific food, temperature, or cage conditions). Also, please describe here how animals were allocated to experimental groups (e.g., littermates of the same sex were randomly assigned to experimental groups). Studies that use live vertebrates must perform their work in accordance with relevant institutional and national guidelines and regulations, and it is required that authors identify here the committee approving the experiments and confirming that all experiments conform to the relevant regulatory standards.

For human studies, the age/developmental stage, sex, and gender identity (if known) of the subjects must be provided. If there are technical or scientific reasons why the sex and/or gender of the subjects cannot be reported, a statement must be provided to disclose this and the reasons why. Please also provide information related to the subjects (e.g., sample size, etc.) or indicate where in the manuscript such information can be found. Studies that work with human subjects are required to provide a statement here identifying the committee approving the studies and confirming that informed consent was obtained from all subjects.

For cell lines, primary cultures, microbe strains, and plants, please describe culture/growth conditions, including temperature. Sex of cells must also be reported. If this is not possible, a statement must be provided to disclose this and the reasons why. Please note here available information about cell authentication. As you may be aware, the practice of cell authentication is becoming more common, and while we understand that this is not yet a standard practice, please indicate whether your cell lines have been authenticated. If so, please describe how.

For all experimental models, we highly recommend including models' RRIDs in their description, as well as using the RRID as the identifier in the key resources table. For more details on how to obtain or generate an RRID for existing or newly generated resources, please visit the RII or search for RRIDs.

For studies that use organisms as source for materials used in experiments (e.g., crystallography, biochemistry, *in vitro* studies), please provide details on the source organism (e.g., strain, growth/husbandry conditions, sex, age, etc.).

METHOD DETAILS

Please provide precise details of all the procedures in the paper (chemical synthesis and materials processing, behavioral task, generation of reagents, biological assays, modeling, etc.) such that it is clear how, when, where, and why procedures were performed. We encourage authors to provide information related to the experimental design as suggested by NIH and ARRIVE guidelines (e.g., information about replicates, randomization, blinding, sample size estimation, and the criteria for inclusion and exclusion of any data or subjects).

All datasets, program code, and methods used in your manuscript must be appropriately cited in the text and listed in the references section, either in the form of the publications in which they were first reported or in the form of independent persistent identifiers such as the DOI. When a dataset, program code, or method has a persistent identifier independent from the original study in which it is first reported, we encourage you to cite both that identifier and the original study. For details on how references should be presented, please see the references section under "how to prepare and submit research articles" on the journal's information for authors page.

QUANTIFICATION AND STATISTICAL ANALYSIS

**Please omit this section if your study does not include statistical analysis or quantification.*

Please describe here all of the statistical analysis and software used. We ask authors to indicate in this section where all of the statistical details of experiments can be found (e.g., in the figure legends, figures, results, etc.), including the statistical tests used, exact value of n, what n represents (e.g., number of animals, number of devices, number of cells, number of times a chemical reaction was run, etc.), definition of center, and dispersion and precision measures (e.g., mean, median, SD, SEM, confidence

intervals). Also please summarize in this section how significance was defined, the statistical methods used to determine strategies for randomization and/or stratification, sample size estimation, and inclusion and exclusion of any data or subjects, as well as any methods used to determine whether the data met assumptions of the statistical approach.

ADDITIONAL RESOURCES

**Please omit this section if your study has not generated or contributed to a new website/forum or if it is not part of a clinical trial.*

Please provide links to websites that provide further information relevant to the study (e.g., protocol download, troubleshooting forum, etc.). Clinical trial registry numbers and links should also be placed here. Please briefly describe the resource and its relevance for the paper. Please report this information as:

"*Description: URL*"

KEY RESOURCES TABLE

The key resources table serves to highlight materials and resources (including starting materials needed for synthesis, genetically modified organisms and strains, cell lines, reagents, software, experimental models, and original source data for computational studies) essential to reproduce results presented in the manuscript. The items in the table must also be reported alongside the description of their use in the method details section. Literature cited within the key resources table must be included in the references list. We highly recommend using RRIDs (see https://scicrunch.org/resources) as the identifier for antibodies and model organisms in the key resources table.

Please do not add custom headings or subheadings to the key resources table.

To create the table, please use the provided table template or the KRT webform.

II. STAR Methods final files checklist

When submitting your article, please provide materials in the formats shown below.

- **Main document file:** *Word or LaTeX document, including (in this order):*
  - Standard article sections (as applicable)
    (title page, summary, introduction, results, discussion, author contributions, acknowledgments, declaration of interests)
  - Main figure titles and legends
  - Main tables and corresponding titles and legends (if applicable)
  - STAR Methods text
  - Supplemental item titles (including "related to" info; mandatory) and legends (optional) for items that are *not* included in the main supplemental PDF (if applicable) (e.g., Excel tables, supplemental movies, etc.)
  - References
    (all main text references, including those cited only in the key resources table and STAR Methods text, are included in the main references list. Supplemental references should be listed in the supplemental PDF. Additional information is available in the supplemental information guidelines.)

- **Key resources table:** *separate Word document created from table template*

- **Main figures or schemes:** *individual TIFF or PDF files*
  (TIFF is preferred format; see figure guidelines for additional specs)

- **Supplemental figures with corresponding titles and legends and supplemental tables with corresponding titles and legends (non-Excel/CSV):** *combined in one PDF file*
    - See supplemental information guidelines for additional details; see *iScience*'s supplemental information guidelines here.
    - Titles should include "related to" info; legends are mandatory for supplemental figures but optional for supplemental tables

- **Supplemental tables not included in the main supplemental PDF:** *Excel or CSV*
    - Descriptive table titles (mandatory) and legends (optional) should be included *in the main document file after the STAR Methods text*
    - Titles should include "related to" info

- **Supplemental movie and/or data files**
    - See supplemental information guidelines for preferred file formats; see *iScience*'s supplemental information guidelines here.
    - Descriptive titles (including "related to" info; mandatory) and legends (optional) should be included *in the main document file (after the STAR Methods text)*

III. STAR Methods reference sheet

This list highlights key points that should be followed to ensure timely acceptance of the manuscript.

GENERAL FORMAT REQUIREMENTS

1. Are there no more than two levels of customized subheadings to help organize the information reported in the STAR Methods text?
2. Are the subheadings shorter than 45 characters and free of numbering?
3. Is sufficient information provided about the methods and analyses so that readers understand how experiments and analyses were conducted and/or modified if based on previously published work?
4. Are the references cited in the STAR Methods text and key resources table provided in the main references list?

RESOURCE AVAILABILITY

1. Is there a lead contact section with the lead contact details provided?
2. Is the lead contact the only author listed? (No other authors should be noted in this section.)
3. Is there a materials availability section with a "materials availability statement" included?
4. Are any restrictions for use of the materials disclosed?
5. Is there a structured, three-part "data and code availability" section with a "data and code availability statement"?
6. Is each part of the "data and code availability" statement chosen from the options described above? (Note that multiple options can be included in each part of the statement and each option can be edited for the sake of accuracy.)
7. Are all datatypes reported in the paper represented in the "data and code availability" statement?
8. If the paper generates a dataset composed of a standardized datatype (e.g., -seq), is it stated that these data are deposited in a Cell-Press-recommended, datatype-specific repository and made publicly accessible?
9. If the paper contains original code, is it stated that the code has been deposited and made publicly accessible?
10. If datasets or code are reported, are readers referred to the key resources table for their accession numbers or DOIs?

EXPERIMENTAL MODEL AND SUBJECT DETAILS

1. Are all experimental models (human, animal, plant, cell line, microbes) listed in this section under separate headings?

2. For **human studies**:
    a. Is there a statement identifying the committee approving the studies and confirming that informed consent was obtained from subjects?
    b. Are the sex, gender, and information about age provided here for all study participants or is it indicated where they can be found? If not, is there a statement of why these data are unavailable?
    c. Are the sample size and how subjects/samples were allocated to experimental groups specified?
3. For study that works with **live vertebrates**:
    a. Is the committee approving the experiments identified?
    b. Is there confirmation that all experiments conform to the relevant regulatory standards?
4. For **animal studies**, are the sex, genotype, age/developmental stage, health status, involvement in previous procedures, and other parameters following ARRIVE guidelines specified? If not, is there a statement of why these data are unavailable?
5. For studies that include both male and female subjects or tissue from both sexes, is an analysis of the influence (or association) of sex, gender, or both on the results of the study provided? If not, is there a statement of why such analyses were not performed? If these analyses were not performed but may be pertinent for the generalization of the results to both sexes, consider covering this topic in the discussion section. Include negative results as well as results that show differences.
6. For **animal and plant studies**, are housing and husbandry conditions specified?
7. For ***in vitro* studies**, including expression systems for source material, are culture conditions/maintenance specified?
8. For **cell lines and primary cultures**, is the sex reported? If not, is there a statement of why these data are unavailable?
9. Is any available information on **cell line authentication** provided?

METHOD DETAILS

1. Are method-specific descriptive subheadings provided (must be less than 45 characters and not numbered)?
2. Is there detailed information on the methods such that it is clear how and why procedures or analysis were conducted?
3. Are the methods provided in full, instead of referring to other papers for details?
4. For experiments in which temperature may impact results (e.g., electrophysiology, behavior of subjects or materials, binding assays, chemical reactions, materials synthesis or characterization), is the temperature provided?
5. Are the references cited provided in the references list?
6. Is there information related to **experimental design**?
    a. Replication
    b. Strategy for randomization and/or stratification
    c. Whether the study was done blinded
    d. Inclusion and exclusion criteria of any data or subjects
    e. Sample size estimation and statistical method of computation

QUANTIFICATION AND STATISTICAL ANALYSIS

1. Is there an explanation of the statistical analysis used to quantify data?
2. Is there a statement of where the statistical parameters (i.e., exact value of n, what n represents, SEM, SD, etc.) are reported in the paper?
3. Is there a statement of whether any methods were used to determine whether the data met assumptions of the statistical approach?

ADDITIONAL RESOURCES

1. If there are websites or resources (i.e., protocol site, forum) that have been created or further expanded by this study to provide additional information or support relevant to the paper, are the information and links reported?
2. If relevant, are the **clinical registry numbers** and links associated with study provided?

KEY RESOURCES TABLE (KRT)

1. Is the KRT provided as a separate file?
2. Have custom headings or subheadings been added to the KRT? (This is prohibited.)
3. Are all of the items in the KRT also mentioned in the method details or main text of the manuscript?
4. Are all of the papers that are cited in the KRT included in the references list?
5. Are the source and identifier provided for all resources, if available? (If an identifier is not available, “N/A” should appear in the column.)
6. Are the unique identifiers provided for all items listed and clearly labeled (e.g., prepended with Cat#, Lot, Clone, RRID, GEO)? Please see the table template for examples.
7. Are all standardized datatypes used or generated in the study included in the key resources table and provided with accession numbers?
8. Is all original code included in the key resources table and provided with a DOI?
9. Is all published code used in the study included in the key resources table with a DOI or a reference to the original paper?
10. When more than 10 oligonucleotides or RNA sequences are used, are they provided in a supplemental table and cited in the KRT?
11. Is there only one item per row?
12. Are the descriptions for the items intuitive and informative?