How to Write a Manuscript that Reviewers (& Editors) will Love

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Editor-in-Chief, Cancer Reports
Developmental Editor, Current Protocols

Rutgers School of Graduate Studies
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Scientific Publishing – A view from the other side
Scientific Publishing: How do journals work?

The traditional publishing process

1. Preparation & Submission
2. Evaluation
3. Publication and Dissemination

http://asapbio.org/digital-age
Choosing a Journal

THE RIGHT PAPER IN THE RIGHT JOURNAL

What is more important to you when choosing a journal for your paper?

a. Speed of publication
b. Access (subscription or open access)
c. Publication charges
d. Impact factor
e. Scope and readership of the journal

https://scientificwritingtips.wordpress.com
Choosing a Journal

THE RIGHT PAPER IN THE RIGHT JOURNAL

Journal Selection Criteria:

Scope/Impact/Audience
Preprint and Archive Policy
Funding mandate (Green OA vs Gold OA)
Publication time (submission to acceptance/publication)

https://scientificwritingtips.wordpress.com
Journal Guidelines

• ALWAYS, and I mean ALWAYS, read carefully the journal’s guidelines for authors
  o What is required at submission? In which format?
  o Is there a template?
  o Is there a graphical abstract? How long?
  o Check the definition of authorship

• Word/Page limits?

• Find out & follow the best practice in the field
  o Reporting standards
  o Data sharing and deposition
  o Open access policy, funders mandates

• Think like a referee, check the journal’s reviewer guide

• Violating ethical guidelines is the fastest way to rejection, and worse (Plagiarism, duplication, fabrication, authorship issues)

• The cover letter is important for many journals
What Happens When Your Manuscript is Submitted?

<table>
<thead>
<tr>
<th>What</th>
<th>Who</th>
<th>Time taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality control</td>
<td>Editorial assistant/Editor</td>
<td>1-3 days</td>
</tr>
<tr>
<td>Suitability for the journal, general</td>
<td>Editor-in-Chief (EiC)</td>
<td>1-5 days</td>
</tr>
<tr>
<td>scientific quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviewer selection &amp; invitations</td>
<td>EiC or Associate Editors</td>
<td>3-15 days</td>
</tr>
<tr>
<td>Peer-review process</td>
<td>2-3 Reviewers</td>
<td>14-28 days</td>
</tr>
<tr>
<td>Evaluation of reviews, recommendation to</td>
<td>EiC/Associate Editors</td>
<td>1-7 days</td>
</tr>
<tr>
<td>EiC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation of recommendation, final</td>
<td>Editor-in-Chief</td>
<td>1-2 days</td>
</tr>
<tr>
<td>decision</td>
<td></td>
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<tr>
<td>Total</td>
<td></td>
<td><strong>21-60 days</strong></td>
</tr>
</tbody>
</table>
Broad Assessment by the Editor

ALL JOURNALS
- Scope
- Format (Communication, full paper, review…)
- Understandability
- Ethical Compliance

Sound Science Journals
- Hypothesis/Aims
- Technical and scientific rigor
- Conclusions supported by data

Selective Journals
- Novelty
- Importance (in specific field / in related disciplines)
- Interest

*Editors are not always qualified to assess the technical merits of a manuscript – This is where peer-reviewers input
Top Reasons for Editorial Triage

• Manuscript does not fall within the aims and scope of the journal.
• Lack of a clear hypothesis or research aim (i.e. written like a report).
• Glaring flaws in the procedures and/or analysis of the data.
• Poor language (grammatical errors, typos, verbose).
• Research topic is of little significance.
• Piece of research is incremental.
• Manuscript has ethical issues
  • Plagiarism
  • Missing ethical approvals and no informed consent from patients
  • Multiple submission
What constitutes Plagiarism?

• Unintentional Plagiarism: A researcher is extensively referencing past works and ends up using too much of the original text from those works.

• Intentional Plagiarism: A researcher presents ideas or findings from other published papers as his own, instead of citing those papers.

Considerations:
• Where in the text do the similarities occur? How much?
• Direct copying and theft? Or use of prior published article as ‘inspiration’?
• Is the data authentic? Are the results new?
What is the peer-review process?

SINCE 1665, TOUCHSTONE OF THE SCIENTIFIC METHOD

“Peer review is the critical assessment of manuscripts submitted to journals by experts who are not part of the editorial staff” - International Committee of Medical Journals Editors

<table>
<thead>
<tr>
<th>WHAT IT SHOULD DO</th>
<th>WHAT IT CANNOT DO (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter out scientifically flawed studies</td>
<td>Detect fabrication</td>
</tr>
<tr>
<td>Provide feedback on structure, presentation, study design and scientific rigor</td>
<td>Prevent duplicate publication</td>
</tr>
<tr>
<td>Make sure results are interpreted correctly, and convincingly</td>
<td>Pick the most interesting papers</td>
</tr>
<tr>
<td>Improve the quality of publication</td>
<td>Ensure the article is right for the journal</td>
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<tr>
<td></td>
<td>Measure the impact of the findings</td>
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</tbody>
</table>

(*) AUTOMATICALLY
This is how reviewers are chosen

- Editors’ knowledge & experience

- From related papers:
  - cited manuscripts
  - literature search

- Additional research:
  - conference/lab visits
  - web search (good ‘ol Google)

- Reviewer database:
  - keywords, interest, history…

- Author recommendations
## Types of Peer Review

<table>
<thead>
<tr>
<th>Modality</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traditional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-blind</td>
<td>• Encourages frank opinion</td>
<td>• Reviewers may be unnecessarily critical</td>
</tr>
<tr>
<td>Author known</td>
<td>• No retribution from author</td>
<td>• Authors fear their work is purposefully delayed</td>
</tr>
<tr>
<td>Reviewer unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double-blind</td>
<td>• Prevents bias</td>
<td>• Author still identifiable (writing style, topic, citations)</td>
</tr>
<tr>
<td>Author unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviewer unknown</td>
<td></td>
<td></td>
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<tr>
<td><strong>Innovative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open</td>
<td>• More honest (transparent)</td>
<td>• Less honest (polite)</td>
</tr>
<tr>
<td>Author known</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviewer known</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Post-publication</strong></td>
<td></td>
<td></td>
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<tr>
<td>Everybody knows</td>
<td>• Encourages further checks, dialog</td>
<td>• Quality control of comments</td>
</tr>
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Manuscript Preparation – THE FIRST STEP
Where to start?

Manuscript Preparation
Manuscript Preparation

How will you begin writing a research manuscript?

a. Introduction
b. Methods
c. Results
d. Discussion
e. Figures
f. Tables
g. Abstract
The order of writing/reviewing different parts of paper is not set in stone.

<table>
<thead>
<tr>
<th>As Author</th>
<th>As Editor</th>
<th>As Reviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figures and Tables</td>
<td>Title</td>
<td>Title</td>
</tr>
<tr>
<td>Introduction</td>
<td>Abstract</td>
<td>Abstract</td>
</tr>
<tr>
<td>Methods</td>
<td>Figures and Tables</td>
<td>Introduction</td>
</tr>
<tr>
<td>Results</td>
<td>Introduction</td>
<td>Methods</td>
</tr>
<tr>
<td>Discussion</td>
<td>Methods</td>
<td>Results</td>
</tr>
<tr>
<td>Abstract</td>
<td>Discussion</td>
<td>Figures and Tables</td>
</tr>
<tr>
<td>Title</td>
<td>Results</td>
<td>Discussion</td>
</tr>
</tbody>
</table>
Tips and Best Practices

1. Title
2. Abstract
3. Introduction
4. Methods and Results
5. Discussion
6. Figures and Tables
7. Journal Selection
Title and Abstract

First impressions for editors and reviewers to assess the paper’s merit and suitability for the journal

- **Title**: Keep the title simple and specific to describe the content and main finding. Be concise, not too technical.

- **Abstract** – Don't cram the abstract with details. Tell the audience that the butler did it in the 1st sentence!
  
  - **Background**: Brief overview and rationale for the study that should provide logical progression to the findings
  - **Objective**
  - **Methods and Results** – Very concisely state how the study was performed and the main findings.
  - **Conclusions** - should provide clear context for the paper’s implications
  - **Key Words**

Tip 2 - Title and abstract: sell your paper!

https://scientificwritingtips.wordpress.com/the-cartoons/
Introduction

An Effective Introduction Leads to a Logical Progression of Why the Study Was Conducted

What is already known about the subject, related to the paper in question
- Is there sufficient scientific background (including relevant references) to understand the motivation, context, and rationale for the study

What is not known about the subject and hence what the study intends to examine (or what the paper seeks to present)

The rationale/significance of the work is established

Are the questions (objectives/hypotheses) you are seeking to answer identified
Editors’ and Reviewers’ expectations for this section have undergone significant changes and trace back to the inception and execution of the study.
The driving forces

Scientific Rigor and Reproducibility

Transparency and access
Open Science

Open Access
Increasing the accessibility of publicly funded research

Open Data
Enabling verification of data, methodology and reporting standards and allowing others to build on existing work

Open Publishing Practices
Increasing transparency and reproducibility of the research process and published product

Open Collaboration
Supporting inclusive and networked research practices

Open Recognition & Reward
Helping integrate researcher identification and evaluation tools

https://authorservices.wiley.com/open-science
Open Data and Open Publishing Practices are sparking discussions and initiatives to improve how research is performed, reported and published.
What goes into the methods section:

- **Experimental Design**
  - Precise details of all procedures (including sequence of manipulation, measurement procedures)

- **Experimental Subjects**
  - Control and experimental procedures, technical and biological replicates

- **Materials**
  - Source, catalog #
  - Cell line authentication

- **Statistical Analyses**
  - Exclusion criteria, outliers defined and handled, data removed prior analyses, randomization and blinding procedures

- **Ethical Approvals and written informed consent (for human subjects)**
Design and Perform a Robust Research Study (Scientific Rigor)

• Well-reasoned hypothesis

• Unbiased, scientifically rigorous study design and statistical analysis
  o experimental subjects
  o experimental conditions
  o blinding methods
  o data points
  o variables
  o sample size
  o replicates
  o statistical assumptions
  o statistical power

• Adherence to reporting guidelines – ARRIVE (Animal Research: Reporting in vivo Experiments) and CONSORT (Consolidated Standards of Reporting Trials)
Randomization and Blinding can Reduce Experimental Bias

• Blinding: Experimenter and/or subjects do not know the experimental condition

• Randomization: experimental subjects (“Units”) are assigned to a group at random

• Extremely important for confirmatory research with major impact.

• Crucial when the study cannot be repeated because of ethical/resource-limitation

## What Biological or Technical Variables Might Influence the Outcomes?

<table>
<thead>
<tr>
<th>Biological variables</th>
<th>Technical Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sex</td>
<td>• Cage</td>
</tr>
<tr>
<td>• Age</td>
<td>• Experimental</td>
</tr>
<tr>
<td>• Litter</td>
<td>• Machine</td>
</tr>
<tr>
<td>• Cell Line</td>
<td>• Batch</td>
</tr>
<tr>
<td>• Species</td>
<td>• Order</td>
</tr>
<tr>
<td>• Strain</td>
<td>• Time period between analysis</td>
</tr>
</tbody>
</table>
What Should You Include In Your Statistics Section?

- How the power analysis was performed to determine sample sizes/effect sizes (and report calculated power/effect sizes)
- Inclusion/exclusion criteria and methods to account for biological and technical effects
- Justification of statistical inference and data transformation procedures
- Assumptions (don’t just say you tested assumptions, explain and provide details)
- Explanation for how data will be presented (e.g., means or medians, SD)
- A link to the data for reviewer/editor verification

For more information -
Data Sharing – to maximize the value of research

- **FAIR** Data - Findable, Accessible, Interoperable, Reusable
- Raw data, processed data, softwares, algorithms, protocols, methods, materials
- Assists editors and reviewers to evaluate research
- Funder Compliance
- Promotes research reproducibility and integrity
- Journal Editors and Publishers are encouraging/expecting/mandating authors to share their data
- For example, many Wiley journals are
  - Publishing ‘Data Statements’ where authors confirm the presence or absence of shared data
  - Partnering with data repositories like Dryad to sponsor the Data Publication Charges for their authors
  - Adopting Data Citation policy
RESULTS

- Organize the results in a **logical order** that address the research questions asked in a stepwise manner.

- Include a **heading for each result** that summarizes the key finding.

- Clearly summarize the findings and point the reader to the relevant data in the text, figures and/or tables?

- Text should **complement** the figures or tables, **not repeat** the same information.

- Present key results without interpreting their meaning
  - Report the descriptive statistics (e.g., mean ± SD or SEM)
  - Quantify all statements concerning significance numerically
  - Report the test statistic, degrees of freedom, test value, and *P*-value and sample size

- Results sections should be written with accuracy, brevity and clarity…
  - **BUT** readers cannot be expected to extract important trends from the data unaided.
Figures & Tables

• Should complement the results.

• Should be self-explanatory

• Do not cram the figures/tables with data points and text! Chose your scale wisely.

• Final figures should be of good resolution.

• Refer the figures in the text.

• Title of a table should be at the top and that of a figure at bottom.

Transparency in Data Visualization

Bar Graph Anatomy – Different datasets can lead to same bar graph

Weissgerber et al., 2017, J Biol Chem

For a quick guide to figures that basic researchers most often use refer Weissgerber et al., 2016, Journal of Neuroscience Research
**Discussion**

Discussion should be concise but informative. Focus on the important and unexpected results. Not on small details.

- Interpret the results considering what was already known about the subject of the investigation
- Provide answers to the testable hypothesis
- Do the findings agree with what others have shown?
- What is our new understanding of the problem investigated and outlined in the Introduction; what are the logical next steps?
- Do the authors consider how the results of other studies may be combined to derive a new or perhaps better substantiated understanding of the problem?
- What are the limitations of the study and what has not been addressed.
- No new results are introduced in the Discussion (or speculations)
- Do not over-interpret.

Tip 6 - Discussion: be frank in acknowledging limitations!

Discuss what is and not what if!!
The Revision Decision

KEEP CALM & IMPROVE YOUR MANUSCRIPT

• Carefully consider referee comments
  • Not all changes have to be made…
  • …but need convincing (scientific) arguments for changes not made

• Prepare revision
  • Revise manuscript
    • Highlight changes in manuscript
  • Point-by-point response to all referee criticisms
    • Changes made
    • Why changes not made
  • Response may go back to referees!
    • Need to convince editor and referees

The peer-review process is not a private conversation between authors and referees. Try to work your answers to the reviewers in the revised manuscript!
Thank You!

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Opportunity to learn and gain experience in Scientific Publishing!
We are looking for enthusiastic and talented early-career researchers with experience in either statistics, clinical oncology, or cancer biology to join our Review Board. Interested candidates, please contact me with a copy of your resume!