

# Publishing Your Research in Peer-Reviewed Journals: Basics of Writing a Good Manuscript

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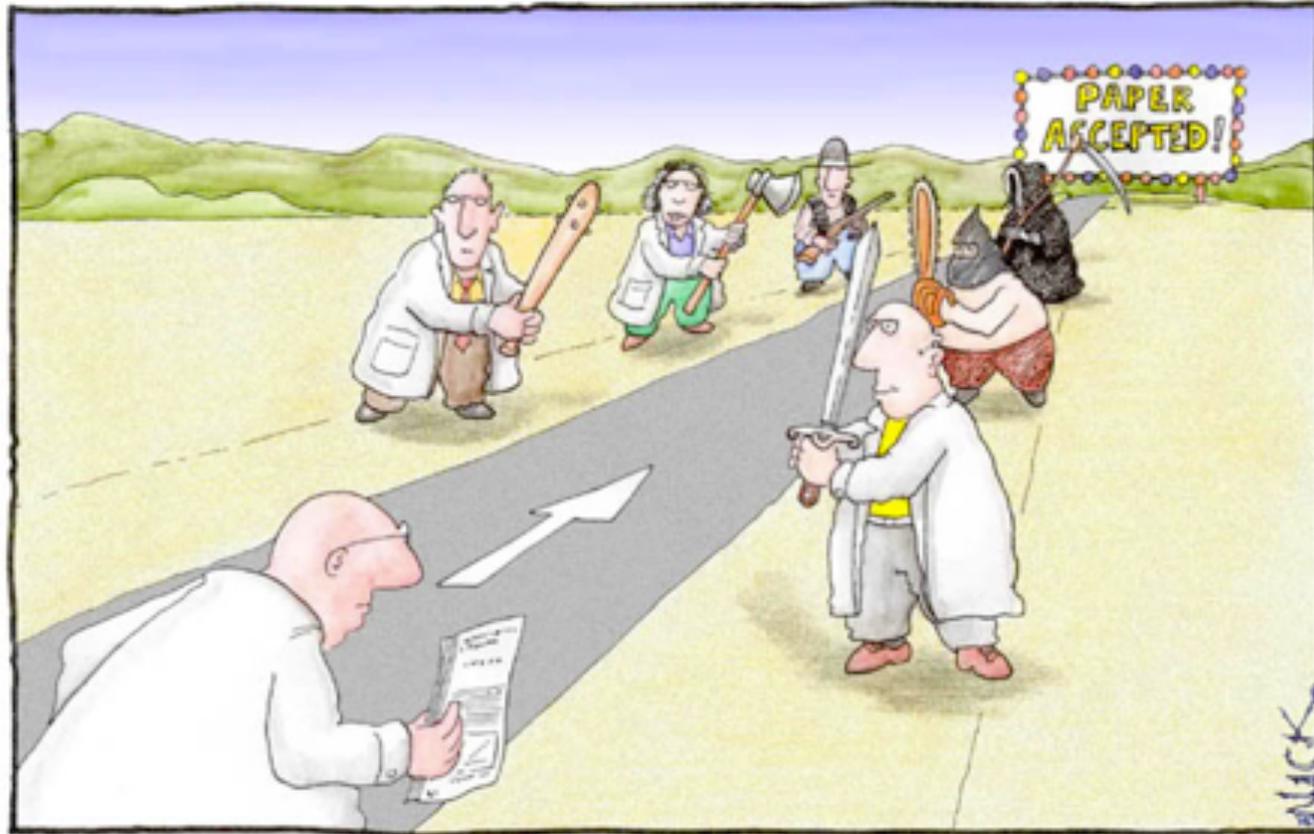
# The Main Points

- Strive for written language perfection
- Expect to be rejected
- Make changes and resubmit

# *Learning About You*

- What journals do you have access to and which do you read regularly?
- Which journals do you aspire to publish in, and why?
- How many of you have published a paper?
- How many of you are writing a manuscript now?  
How many are preparing to write one?
- Do your institutions have any resources (e.g. centers, classes, etc.) to help you learn to write scientific manuscripts?
- What writing skills do you feel you already have?
- What new skills would you like to learn from our workshop today?

# What Should You Think of When You Hear “Peer Review?” What is it?



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

# What Should You Think of When You Hear “Peer Review?” What is it?

- Improves the quality of scientific research
- Maintains standards
- Provides a measure of credibility
- Helps an Editor decide what qualifies as “publishable science”
  - What’s original
  - What’s scientifically important
  - What’s scientifically sound
  - What’s within the journal’s scope



# Why is It Important?

The peer-review system protects the community from ill-founded and/or bad science

From John C. Polanyi:

*“The society of scientists, more complex than that of ants, balances the need for freedom against order. Freedom is vital, so imagination can take flight. But to avoid chaos, scientists subject themselves to rules. These rules are uncodified, and enforced without police.*

*Publication is censored by scientific juries, to protect the community from ill-founded reports. Such censorship is hazardous, hence subject to constant scrutiny by the scientific community. **The objective is to flag what’s important, set aside what’s pedestrian, and abjure what’s fraudulent. That’s a tall order, but the health of science depends on it.**”*

John C. Polanyi, Professor and Nobel laureate  
Department of Chemistry, University of Toronto  
(The Toronto Globe & Mail, Oct. 3, 2011)

# What is the Role of Peer-Review in Scholarship?

- Ensure scientific integrity
- Ensure relevance
- Ensure the quality of the transmission of scientific information
- It's meant to make your work BETTER!
- Also used for promotions and tenure decisions

# When Am I Ready to Write a Manuscript?

Published manuscripts are the currency of our profession and are building blocks that define the body of our work.

- Ask yourself:
  - Do my data “tell a story” or are they merely pieces of information? (you have to have an answer to a clearly articulated question!)
  - Do the results I achieved move the state-of-knowledge for the field forward? (don’t just do it because it could be done!)
  - Is the information I have collected relevant to others? (who really cares anyway?)

# Preparing to Write a Manuscript: The Importance of Language Skills

- You must become proficient in writing in the *language of the journal*
- Many papers do not survive the peer review process if the language is sub-standard
- Learn to write well using an appropriate scientific format
- Seek out and use any resources available to you (human and otherwise)

# What Should Be the Order of Authors? Why?

Authorship should be restricted to those individuals who have made substantial scientific contributions to the story being told

Typically:

- Students and/or postdoc researchers who performed the research
- The principal investigator/research director of the laboratory
- Heads of academic units or institutions are not appropriate as authors simply by position unless they have contributed substantially to the scientific basis of the work

Often the manuscript will be a collaborative effort; all major groups must be satisfied with the author list prior to submission

It is not appropriate to include someone without their input to the submitted version of the manuscript or without their knowledge

*What would be the authorship and the authorship order on your next manuscript and why?*

# What Should Be the Order of Authors? Why?

- Depends somewhat on the field
- In many science journals, first author is typically the individual who performed the most important part of the research and made major contributions to the writing of the manuscript
- Remaining authors should be listed in order of their contributions to the scientific basis of the work
- Typically, the research director or principal investigator is last on the authorship list
- *All authors should agree on the author order prior to submission*

# Choosing the Appropriate Journal

*GOAL: To submit your manuscript to a journal in which it has a high probability of being peer-reviewed favorably so that it gets published*

## *Criteria*

- Research fits within scope of the journal
- Research reaches the right audience (addresses the interests of the primary readership of the journal)
- Significance of research in the broader community is consistent with other works published in that journal
- Match your manuscript to the expertise of the Editors

*Your Difficult Task: To critically evaluate the significance of your work in the context of the broader profession*

All authors must agree on journal choice before submission

# The Mechanics of Writing / Submitting

- **Know Your Audience:** Obtain the *Guidelines for Authors* for your intended journal; read them carefully to understand scope, format, and length limitations
- Organize your data into the story you wish to tell; develop figures and tables of your data into the “story line” of your manuscript as a first order of business
- Write an outline of your manuscript around the story that the data tell; refine it in multiple iterations to be increasingly specific
- Write a draft. It’s the best tool for determining:
  - If the results you have collected support the major conclusions;
  - Or, If additional experiments are warranted
- **Review your draft as if you were learning about your work for the first time; add details that would allow for an experienced colleague to repeat the study and obtain the same results**

# What Steps Should I Take to Write?

- Order of the paper:
  - ✓ *Title*
  - ✓ *Abstract*
    1. *Introduction*
    2. *Methods/Experimental Section*
    3. *Results*
    4. *Discussion*
    5. *Conclusion ( or summary)*
    6. *Future work*

Write this list down on paper or a file, but:  
***This is NOT the order to write!***

***Note: Keep each draft of each outline and just keep adding...***

# What Steps Should I Take to Write? (order)

- **Methods/Experimental Section:** Start easy—you know what you did; *not* a step-by-step “how to” like a laboratory manual but must include all relevant details necessary to allow someone to reproduce the work
- **Results:** Present your findings in words accompanied by appropriate high-quality and well-presented data
- **Discussion:** Put your findings in context; draw conclusions that are substantiated by the data presented in the Results section. *DISTINCT FROM RESULTS (Results must stand on their own.)*
- **Introduction:** Summarize only what the reader needs to know in order to read the Discussion; *include clear statement of novelty and significance*
- **Conclusion / Summary:** State significant finding; if none, then summarize.
- **Abstract:** Take from above sections to present a cohesive general overview
- **Title:** Describe your work in as few words as possible, but be appropriately descriptive. *Can you create examples of good and bad titles for your next manuscript?*

# Dos and Don'ts of Presenting Your Data I

- DO include the minimum data necessary to support your claims
- DO present your data in as concise and clear a manner as possible
- DON'T include redundant presentations of data; either a figure or a table of the same results is sufficient
- DO include appropriate statistical information to convey precision of results, e.g. data points show error bars, tabulated values include standard deviations; or a global indication of precision reported in the text (e.g. wavelengths are reported to  $\pm 1.0$  nm)
- DON'T include irrelevant or redundant columns or rows in tables

# Dos and Don'ts of Presenting Your Data II

- DO make your figures legible with labels that will be readable when reduced to journal size
- DON'T produce figures containing a lot of blank white space
- DO use Supporting Information (Supplementary Material) to include additional data that support your claims
- DON'T include figures based on trivial or non-essential data that are described simply in the text (e.g., “The film resistivity, taken using a standard four-probe technique, was 200  $\mu\Omega\text{-cm}$ .”)
- DO include a complete description of the figure in the caption; include in this caption a clear statement of what every part of the figure represents

*Can you think of others?*

# Proper Referencing and Citation Software

## *When Do I Need a Reference Citation within my Manuscript?*

- Your manuscript must include appropriate citations to the primary literature; these reference citations do not have to be absolutely comprehensive but should convey your sense of familiarity with the primary literature in your area and should include the most important and/or relevant references
- Improper referencing can be a basis for rejection of a manuscript by an Editor or the recommendation for rejection by a Reviewer
- ***General guideline:*** A reference citation is needed for any statement or claim made within the manuscript that is not substantiated by the original data included within the manuscript (unless it is common knowledge; like Newton's second law).
- Reference citation software is very good today, e.g. EndNote – if you can, access this and learn how to use it in the preparation of your manuscripts (relatively inexpensive student versions are available)

# Preparing Your Final Manuscript for Submission

- Good language skills are critical; if possible, have a native English language speaker read and correct grammar, punctuation, and common usage errors
- Language editing services are available for this task if you can afford them. Some examples:
  - Editage ([www.editage.com](http://www.editage.com))
  - OnLine English ([www.oleng.com.au](http://www.oleng.com.au))
  - SciTechEdit International ([www.SciTechEdit.com](http://www.SciTechEdit.com))
  - Spi ([www.prof-editing.com](http://www.prof-editing.com))
- Learn from others. Give the manuscript to others to read and edit. Share with:
  - All team members working on the project
  - Your supervisor
  - Other lab mates or colleagues
  - A knowledgeable scientist who does not know the details of your work but is familiar with the broader area of your field

# How Do I Prepare My Submission to Ensure the Greatest Chance of Success?

- Review and follow the journal's Author Guidelines
- Review and follow the journal's Ethical Guidelines for Publication
- Choose a title that is clear and concise
- Complete all forms and provide all information requested during the submission process
- Describe the impact of your research in a compelling and well-written *cover letter* that concisely articulates what you did and the novelty and significance of your work
- Along with your co-authors, identify a list of *appropriate* peer reviewers; you will be asked for these during the submission process – they convey a lot about your understanding of the peer review process to the editor handling your manuscript!

# How Can I Write the Best Possible Cover Letter?

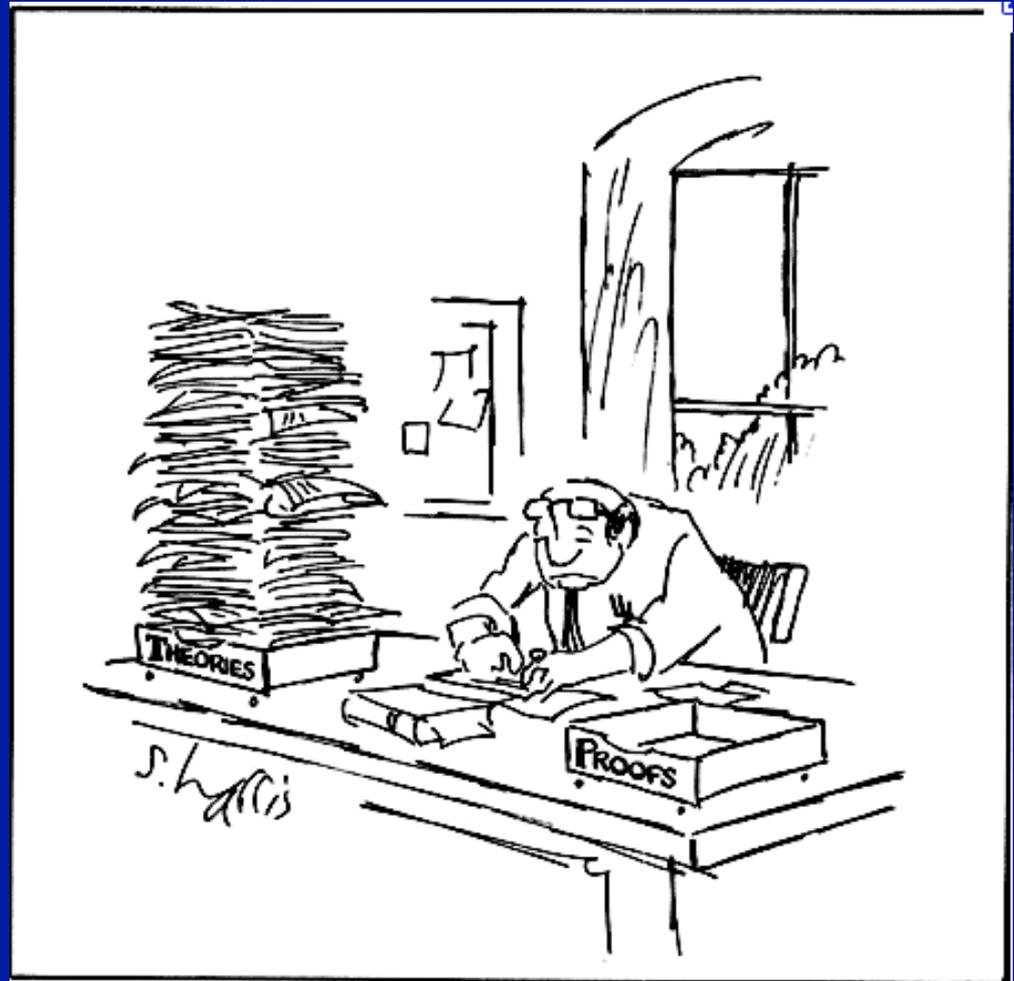
- The cover letter should contain:
  - Title and type of manuscript being transmitted
  - Statement that you are transmitting on behalf of all Authors
  - Suggested Reviewers with contact information and list of pertinent expertise (make it easy for the journal editors)
  - Identify any Reviewers who should be excluded and give a simple reason for exclusion; examples include conflicts of interest (relatives, collaborators) or competitors (and why).
- DON'T repeat the abstract
- DO concisely convey to the Editor your major findings and highlight the novelty and relevance of the manuscript for the journal's readership

# How are Reviewers Chosen?

- Author Suggestion
  - Authors suggest Reviewers and those who should be excluded
  - Authors should provide full contact information for suggested Reviewers
- Editor Selection
  - Editor may or may not use suggested Reviewers
  - Editor will study the text and bibliography to identify other key Reviewers in the field relevant to the manuscript
  - Editor searches for related articles in databases (SciFinder, Google, Web of Science)
  - Editor uses the title, keywords, and phrases from the text as the basis for searching
  - Editor finds related articles that cite the Authors' previously published work
  - People acknowledged in manuscript are excluded
- Reviewer Recommendation

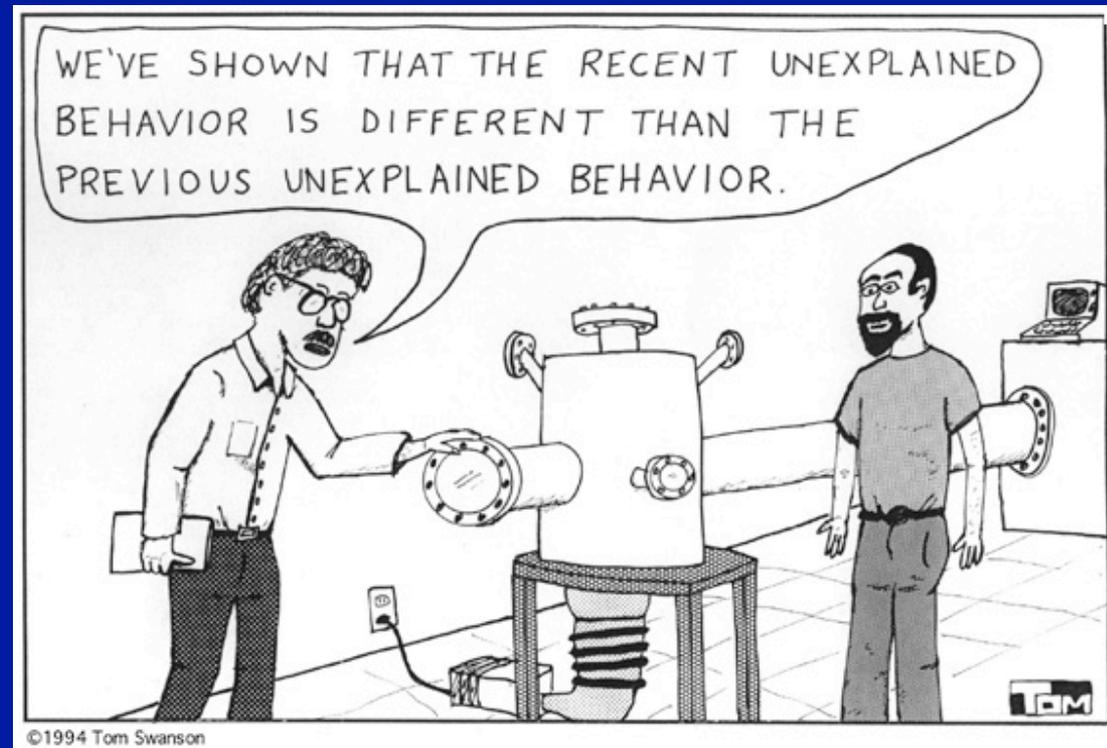
# The Most Common Mistakes Editors Encounter - I

- INAPPROPRIATE journal
  - Wrong scope/audience
- INCORRECT formatting
  - Does not adhere to journal guidelines
- PREMATURE publication
  - Conclusions not validated



# The Most Common Mistakes Editors Encounter - II

- LACK of novelty
  - Reporting routine results
  - Reading like a lab report or merely tabulating data
  - Duplicating earlier work



# The Most Common Mistakes Editors Encounter - III

- TOO MUCH routine detail in Experimental Section
  - Use Supporting Information instead
- FAILURE to properly cite literature precedent
- INADEQUATE characterization of materials measured
- INAPPROPRIATE Reviewer suggestions
  - Don't suggest your friends, your former advisors, your graduate school roommates, collaborators, your significant other...

# The Most Common Mistakes Editors Encounter - IV

- Lack of focus
  - Trying to cover too much material
  - Trying to justify its relevance from all possible viewpoints
  - Making the presentation of data hard to follow
- Missing important control experiments
- Failure to address alternative explanations
- Making (unintended) unjustified strong statements (“This is the best analysis ever developed for...”)
- Claims of priority (“We were the first to do this.”)

# How Does Peer Review Work Within Many Journals

1. The Editor-in-Chief receives a manuscript, examines it, and then:
  - a) Transmits it to an Associate Editor who has the proper expertise  
— OR —
  - b) Decides to decline to publish
    - Inappropriate topic for the journal’s readers
    - Poor quality (written in poor English, incorrect formatting)
    - Blatant lack of novelty (in view of previous articles)
  
2. The Associate Editor may:
  - a) Evaluate on a similar basis  
— OR —
  - b) Transmit the manuscript to Reviewers for further evaluation
  
3. Editors evaluate the Reviewer comments and decide to accept the manuscript, return it for revision, or decline to publish.

# How Might an Editor Come to a Decision?

- Read all Reviewer reports carefully and examines the manuscript to better understand the Reviewers' concerns
- Assess the concerns of the Reviewers as to merit
- If questions still remain, the Editor may request the comments of another scientist
- Transmit the decision to the Authors, often with an explanation, especially in cases of rejection or request for major revisions

# How Should Authors Handle Reviewer Comments?

- Reviewers generally are trying to help!
  - Their feedback is important and invaluable
- Authors must read the Reviewers' comments
  - Carefully
  - Understand the nature of the critique
  - Evaluate their importance
  - Revise according to the critique
  - If an Author chooses not to address some of the critique, the Author must indicate why he/she is taking that course of action.

# What are the Most Common Mistakes Authors Make When Replying to Editors and Reviewers?

- Lack of attentiveness
  - Authors need to thoroughly examine the critique in each review
- Incomplete revisions
  - You cannot simply ignore a comment by a Reviewer if you do not agree, do not like it, or do not know how to respond to it
  - Failure to explain why some changes suggested by a Reviewer were not made will get your manuscript rejected; each comment by a Reviewer should be examined and addressed point-by-point whether or not the Author actually makes the requested change
- Becoming EMOTIONAL
  - *Reviews are not personal* — do not take them as a personal attack on your worth as a scientist or the value of your contribution!

So...

Now go write a  
*GREAT*  
manuscript  
about your  
research!!