How to Write a Scientific Article

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Before Writing: Doing the Study

- Prospective better than retrospective
- Controlled (randomized) much better than uncontrolled!
- Register your controlled study *(clinicaltrials.gov)*
- Translational study: mechanistic better than descriptive

When the Study Is Done:

- Single large paper better than 2-3 small related papers
- Latter is called “least publishable unit”
- LPU risks significant overlap
- LPU disservice to authors, journals and scientific community
- Letters to the Editor are not considered scientific publications and are not subjected to the same peer review process.

Ask Yourself:

- Do I have a story to tell?
  - Editors and reviewers look for original and innovative research that adds to their field of study, or immediately impacts patient care.
- Is there an audience for my research findings?
- Consider whether your research is of interest to a local, regional or international audience.

How to Publish in Top-Grade Peer-Reviewed Journals

- Identify a clear scientific objective
- Produce solid data with impeccable methodology
- A well-written paper will convey a clear message
- Make good friends among your peers…
- Good luck!

Outline

- Publishing: why?
- Choosing the right journal
- Ethics in Science
- Writing your manuscript and submission tips
- Responding to first reviews
- Rejection: what next?

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Why Publishing in a Scientific Journal ?

"Scientific knowledge is a communal resource that only exists because it is available for others to judge and affirm as important"
(B. Lewenstein, Cornell University)

"Researchers publish for economic self-interest, … it provides visibility and is evidence of productivity"
(E. Huth Ann. Intern Med.)

"No publication, no funds; no funds, no job"
(J. Flower-Ellis, Swedish University of Agr. Sciences)

"Publish or perish !"
(Multiple Authors…)

"A scientific experiment is not complete until the results have been published"
(B. Day, University Delaware)

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Choosing the Right Journal

- Look at an issue: publishes similar papers to yours?
- Consider your target audience
- Ask: will my message interest readers?
- Think of more than just Impact Factor
- *Reviews*: send inquiry letter first to editors

Choosing the Right Journal

- Take into consideration the type of article you'd like to publish (full length original, letter, review, short communication)
- Read the journal's aims and scope on the journal homepage
- Read or download the journal's Guide for Authors
- Check the journal's performance for review and publication timelines
- Other considerations, eg open access options
- Submit your paper to only one journal at a time (ethics!)

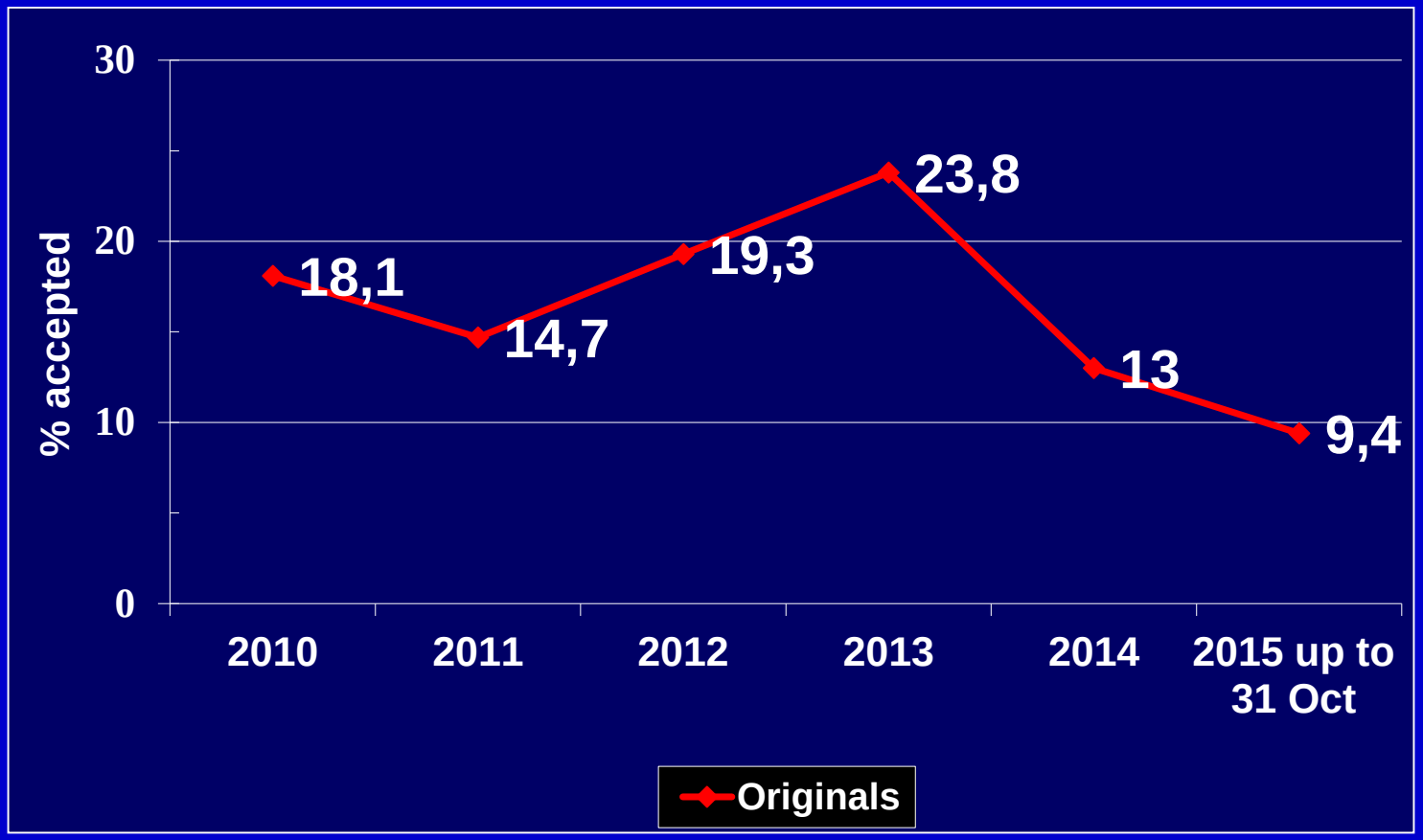
Time to acceptance

13-00001→14-00512	14-00513→15-00407
Days	Days
125	61

Time to rejection

13-00001→14-00512	14-00513→15-00407
Days	Days
40	9

Yearly Acceptance Rates (2010-2015, Original Articles)



Impact Factor Is Not the Most Important Thing in Life!

- Mullis K – PCR original description published in *Meth Enzymol*, after rejection by *Nature*

- No matter *where* you publish but *what* you publish!

About Water Memory…

- Water memory is the purported ability of water to retain a memory of substances previously dissolved even after an arbitrary number of serial dilutions.

- It has been claimed to be a mechanism by which homeopathic remedies work, even though they are diluted to the point that no single molecule of the original substance remains.

About Water Memory…

- In 1988, Jacques Benveniste published a study supporting a water memory effect amid controversy in *Nature*, accompanied by an editorial by Nature's editor John Maddox urging readers to "suspend judgement" until the results could be replicated.

- None has ever been able to reproduce Benveniste's results in controlled conditions.

Before Writing, Decide:

- Who are the authors (and in which order)?

- ALL authors must have significantly contributed to at least one of: study concept, protocol design, data collection, data analysis, drafting manuscript, AND: revision and final approval of manuscript
  ‘gift’ authorships strongly discouraged

Authorship

- Do not change authors after submission unless new author(s) contribute significantly to revision
- Routine clinical care is not a criterion for authorship
- Providing patient material or reagents that have already been published does not constitute right to authorship
- Being in the same division/department not criterion for authorship

Criteria for Authorship

- **Substantial contribution to**
  - **Conception and design**
  - **Acquisition of data**
  - **Analysis of data**
- **Drafting the article or revising it critically**
- **Final approval of the version to be published**

http://www.icmje.org/index.html

The Story of a Young Faculty Member…

Planning a submission of a MS

- Submitted to IRB, collected data, wrote 1st draft

- Senior faculty member made suggestions at all stages
- Statistician ran the data but has not read the MS.
- Chairman suggests to add co-authors just prior to submission
  - *Tit-for-tat* ("equivalent retaliation" or "reciprocal altruism": will be included in the publication of others)
  - One such co-author is a prominent investigator (improve chance of acceptance)
  - One such co-author has not published in years and needs publications for promotion. He/she took care of patients in the study.
  - The Chairman, as in all papers from his/her department, should be listed too.
- What should the young faculty member do?

Adapted from J Vasc Surg 2005; 42:816

Publication's Level According to Author's Academic Standing

Who	Why	Where
Assistant Prof.	He has something to say	Scientific journals
Associate Prof.	He has to say something	Local journals
Full Professor	They told him something	Women's magazines

A. Campanile. Il Tallone di Achille (Campanile), ovvero come scrivere un articolo scientifico.

The Matthew Effect

- Discovery credit can be willfully or inadvertently reassigned from the original discoverer to a better-known researcher.

- A prize will almost always be awarded to the most senior researcher involved in a project, even if all the work was done by a graduate student.

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It’s a Jungle out there…

- **Non-Scientists Think of Science as Universal. Celestial, even.**

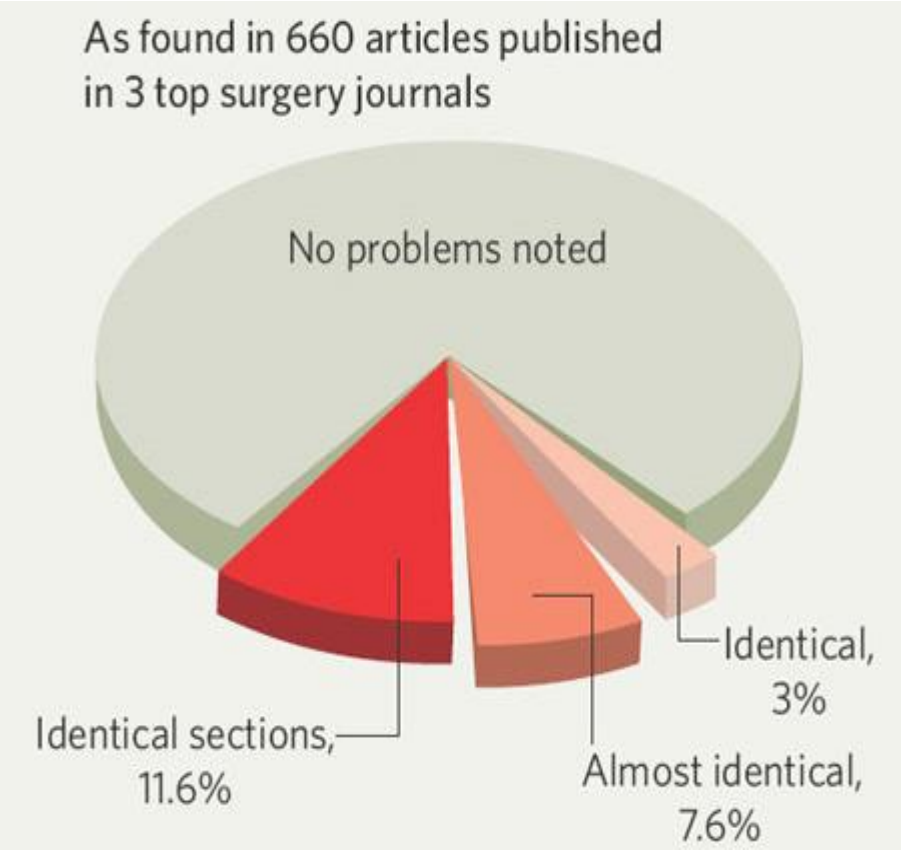
- **But Science Is Terrestrial. Territorial. Political.**

William Nicholson

Accountability of the Written Word: a List of Sins

- Fabrication. Making up results and recording or reporting them.
- Falsification. Manipulating research materials, equipment, or processes or changing or omitting or trimming data or results such that the research is not accurately represented in the research record.
- Plagiarism. Appropriation of another person's ideas, processes, results, or words without giving appropriate credit. Includes negligent failure to recognize priority.

Plagiarism



Surgery 2001; 129:665-601

Self-Plagiarism

- Multiple publication of the same content with different titles and/or in different journals is also considered misconduct.

- Referred to as "salami" (i.e. many identical slices) in the jargon of medical journal editors (MJE).

Plagiarism-Fabrication

- The act of taking an unrelated figure from an unrelated publication and reproducing it exactly in a new publication (claiming that it represents new data).

- Recent papers from the University of Cordoba have come to light showing how this can go undetected and unchallenged for years

Ghostwriting

- The phenomenon where someone other than the named author(s) writes the manuscript.

- Typically, this is done to mask contributions from drug companies. It incorporates plagiarism and has an additional element of financial fraud

Responsibility of Journals

- Journals are responsible for safeguarding the research record and hence have a critical role in dealing with suspected misconduct.

- This is recognised by the Committee on Publication Ethics (COPE) which has issued clear guidelines on the form (e.g. retraction) that concerns over the research record should take.

Publication: an Honour Code

- Reliable data
- Accurate presentation of results
- Human/Animal Investigation approval
- Informed patient consent
- Explanation of financial support
- Disclosure of potential conflict of interest
- Registration of clinical trials (clinicaltrials.gov)

THE SYSTEM IS BASED ON TRUST !!!

ON THE TAKE

HOW MEDICINE'S COMPLICITY WITH BIG BUSINESS CAN ENDANGER YOUR HEALTH

JEROME P. KASSIRER, M.D.

ACADEMIC RESEARCH

CLINICAL INVESTIGATION

Clinical care and/or translational research

Education

Scientific Discovery

PHARMACEUTICAL INDUSTRY

Scientific discovery

Clinical trials

Profitability

Conflict of Interest Must Be Declared

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When to Write

- Start before study ends: title, intro, methods and part of discussion can be drafted
- Finish writing as study being finished
- Avoid long delays (several months) between end of study and writing
- You need enthusiasm!

Writing Mechanics

- Short simple sentences
- Active, not passive style. Not: “It was previously discovered by our lab that…”, but: “We previously showed that…”
- Use spellcheck and grammar check if possible (most word-processing programs)
- *Avoid abbreviations, except standard ones such as DNA, HCC, RT-PCR, etc*

Writing Mechanics Examples

- Not: ‘drug x induced a decrease in glucagon levels…’
- But: ‘drug x decreased glucagon levels…’

- Not: ‘A not inconsiderable amount of data in the literature supports the view that…’
- But: ‘The literature suggests that…’
- Or: ‘Previous studies suggest that…’

Avoid Nonstandard Abbreviations

- Bad: ‘P treatment of the LC group showed more pronounced effects on PP than P effect on the CH group. Therefore, we believe the that the degree of liver failure in LC, judged by CP score is important to estimate PP response to P therapy in LC patients.’
- (P=propranolol; LC=liver cirrhosis; PP=portal pressure; CH=chronic hepatitis; CP=Child-Pugh)
- *Horrible!!*

“Liver Cirrhosis” Is Redundant

- Cirrhosis only affects liver, not other organs

- Nobody says: “kidney glomerulonephritis”, or “heart myocardial infarction”, or “lung pneumonia”

If English Is Not Your First Language

- Ask native speaker or very fluent person to read your paper
- Professional (but expensive) scientific manuscript revising/editing services available
- Use the grammar check or spellcheck tools on word processing programs
- Avoid ghostwriting!

Journal’s ‘Instructions to Authors’

- READ this carefully, and do EXACTLY as it says
- Careless small errors (‘typos’) or not conforming to journal’s instructions leave negative impression

Make It Beautiful…

Writing the Manuscript: Title

- The title is the main advertisement for your article.
- Clear, concise, informative, catchy, enticing.
- Avoid questions.
- Essentially, effective titles:
  - identify the article's main issue
  - begin with the article's subject matter
  - are accurate, unambiguous, specific and (when possible) complete
  - as short as possible

Good and Bad Title Examples

- Hyperdynamic circulation in cirrhosis (too short, uninformative, no species)
- Does glucagon cause hyperdynamic circulation in cirrhotic rats? (question)
- Pathogenic role of glucagon and glucagon-like peptides in increased cardiac output, systemic vascular resistance and arterial hypotension in rats with carbon tetrachloride-induced cirrhosis (too long)
- Glucagon induces hyperdynamic circulation in cirrhotic rats (preferred)
- Pathogenic role of glucagon in hyperdynamic circulation in cirrhotic rats (OK, but above better)

Abstract

- The abstract is your chance to describe your research in 200 words – so use it wisely.
- Many authors write the abstract last, so it reflects the content accurately.
- Summarize the problem or objective of your research, and its method, results, and conclusions.
- Make it interesting but…don’t promise more than your article delivers.
- Most readers will only read your abstract!

Introduction

- 2-3 paragraphs, justification/rationale of study
- Briefly summarize what is unknown.
- State your hypothesis or aim
- State how you will test your hypothesis:1-2 sentences
- Avoid detailed review of literature: don’t make it a history lesson!
- Avoid brief summary of your results
- Do not provide results beforehand (American Style…)

Methods

- Enough detail to allow somebody else to reproduce your study
- If your methods are new, you'll need to explain them in detail. If they've been published before, just cite the original work
- Level of detail appropriate to journal/audience
- Provide specific details as supporting material
- Statement of human or animal ethics required by most journals
- Details of patients studied (table)

Statistics

- >1/3 of statistical analysis in published papers is incorrect or inappropriate
- Assuming normal distribution (parametric) when it is nonparametric or unknown is a common error
- If appropriate, consult with statistician

Results

- This section should present your findings objectively in a clear and logical order.
- Figures to illustrate main points/messages.
- Do not duplicate data in text and tables/figures.
- If complex with lots of data, do not show ALL the data, just major data.
- Use web figures to share data that are not essential to show “in print”.

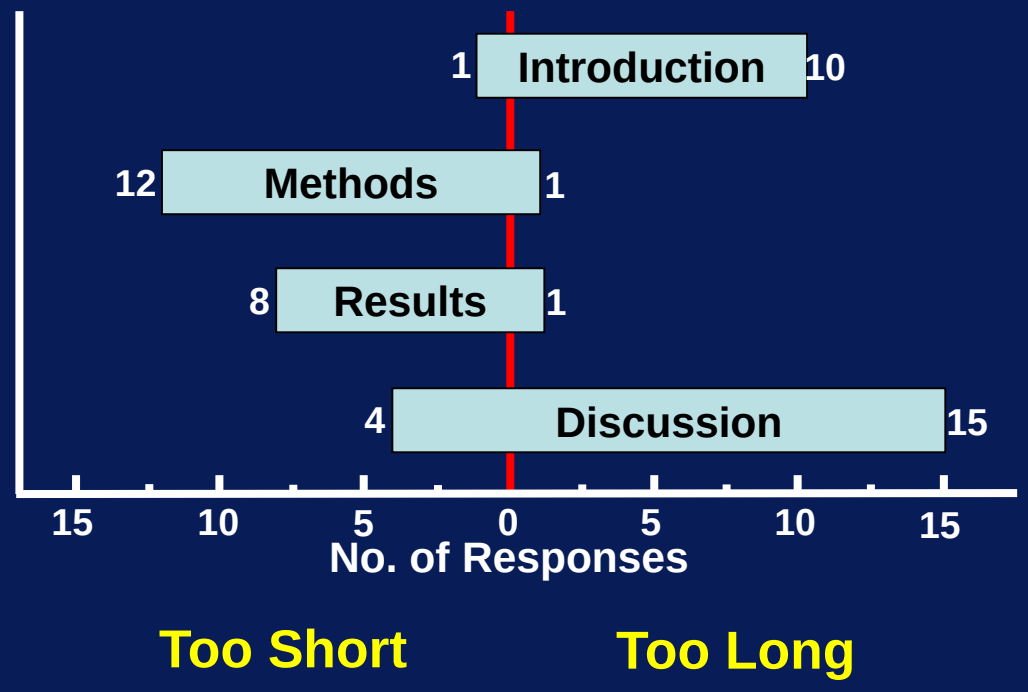
What Is Wrong Here?

	Group A	control group
Bilirubin (µmol/L)	**46.73 ± 79.92**	**13.4 ± 3.56****
Portal pressure (mmHg)	**17.66 ± 6.34**	**3.28 ± .97***

Discussion

- Briefly review what is known and unknown
- Indicate how your results advance knowledge in the field
- Compare with previous studies
- HIGHLIGHT WHAT IS NEW!
- Discuss what you studied, not what you did not study: BE FACTUAL!
- One or two brief speculations OK

Sections of a Manuscript that Are either Too Long or Too Short



Byrne DW. Publishing your medical research paper: what they don't teach in medical school Baltimore: Lippincot Williams & Wilkings; 1998, p.58

References

- Try to be fair/balanced: avoid too much self-citation
- Cite the correct reference (originals and not reviews)
- Avoid too many references (limit approx 1:100 words text, e.g., 30 refs for 3000 word paper)

Figures

- Conform to requirements of the journal (in ‘Instructions to Authors’)
- Large enough details so visible when photo-reduced by journal
- If figures are too complex or confusing, consider splitting into 2 separate figs, or not showing some data
- Use supporting (web) figures for useful but non-essential data

Cover Letter to Editor

- ***BRIEFLY highlight what is new or significant (2-3 sentences or bullet points)***
- More important with ‘bigger’ journals
- Suggest impartial referees, preferably from another country
- If scientific or personality clash with others, *you may ask* for non-preferred but I usually avoid that…

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Response to First Review

- Read the editors' letter carefully!
- *Politely* address each specific point raised by editors and reviewers: don't be confrontational!
- Change/modify according to reviewer's wishes for small issues, e.g., grammar or style changes, delete/change fig 3, etc., more (or less) discussion of point x, more experiments, etc.
- Defend the major points that you believe in but *try to concede as much as you can…*

REJECTION!

Not the end of the world: have a glass of wine before doing anything…

Do Not Overreact !

Take it Easy…

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If Rejected…

- Almost always useless to fight this decision
- Rebuttals are seldom considered and only in case of ominous errors by Editors/referees
- Sometimes referees' comments seem mild and easily fixable, but paper rejected: usually insufficient novelty or limited translational message
- Revise according to comments, perform new experiments if required and submit elsewhere

Summary

- Highlight the good/novel
- De-emphasize the weaknesses
- Make it beautiful!
- KISS (keep it simple, stupid)