# How to write great papers

## *From title to references*

## *From submission to publication*

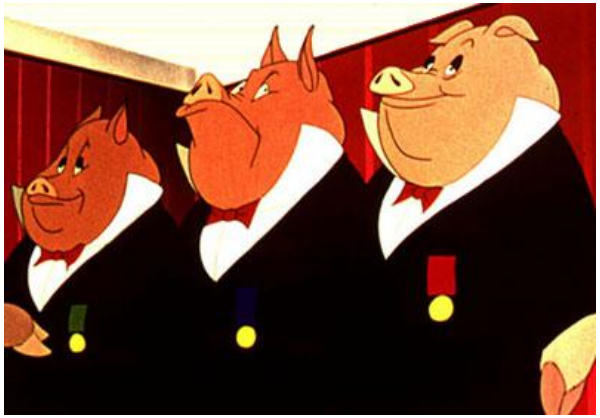
Lynn Sherrer, Ph.D.
Publisher, Biotechnology
Elsevier
Cambridge, MA, USA

# What are *your personal reasons* for publishing?


However… editors, reviewers, and the research community don't consider these reasons when assessing your work

# What distinguishes an excellent article from a poor one?

*"All animals are equal, but some animals are more equal than others."*
**- George Orwell - Animal Farm**



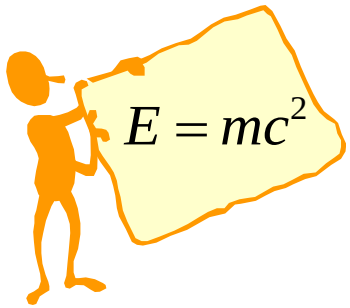
# A good manuscript has…

**good *CONTENT***

- **useful and exciting**

**good *PRESENTATION* of the data**

- **clear and logically constructed**



# Why do you publish your work?

## Check the originality of the idea at the very beginning of your research

- **Do you have something to tell?**
- **Does anybody want to hear/read your story?**

  - **Have you REALLY done something new and interesting?**
  - **Is there anything challenging in your work?**
  - **Is the work directly related to a current hot topic?**
  - **Have you provided solutions to any difficult problems?**

IF the answers are **'yes'**, it's time to start preparing your manuscript!

# Choose the right journal

- **Assess the quality of the work you want to publish**
- **Who do you want to reach?**
  - Parasitologists? Epidemiologists? Physicians?
  - International? National?
- **Articles in your references may lead you to the right journal**
- **Candidate journal**
  - Aims and Scope
  - Types of accepted articles / Hot topics
  - Readership
- **Ask your supervisor or colleagues for help**
  - The supervisor - who is often a co-author - has at least co-responsibility for your work

# Choose the right journal

## Do not just ‘descend the stairs’

**Top journals**

Nature, Science, Lancet, NEJM…

↓

**Field-specific top journals**

↓

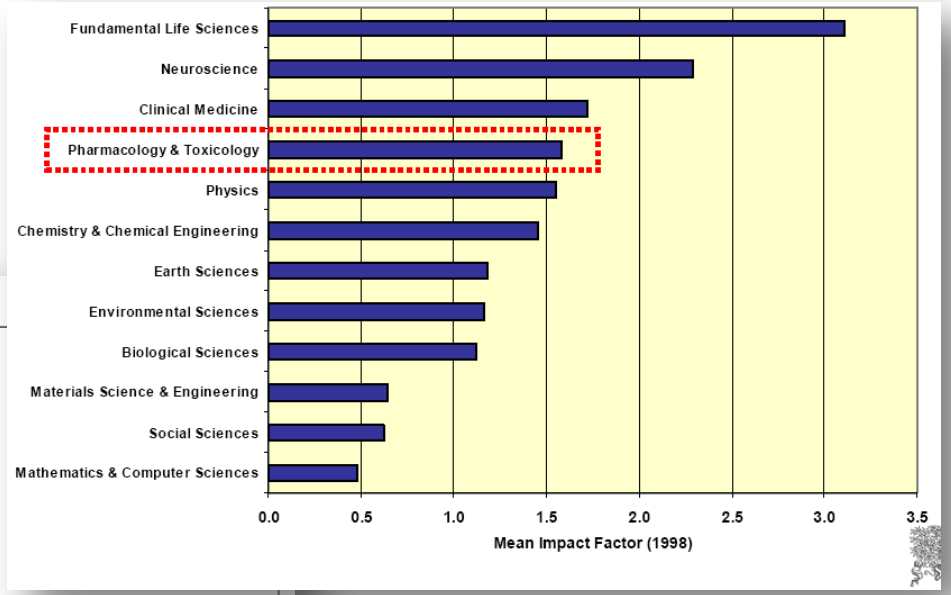
**Other field-specific journals**

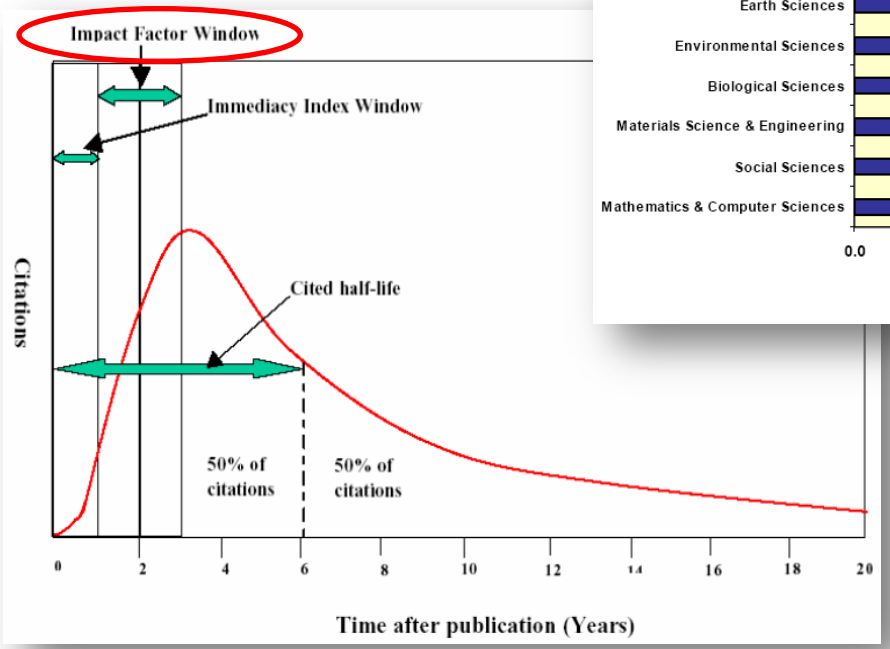
↓

**National journals**

# Impact Factor & H-index

**'Impact Factor 2011' ≈ The average number of times an article published in 2009 or 2010 was cited in 2011**

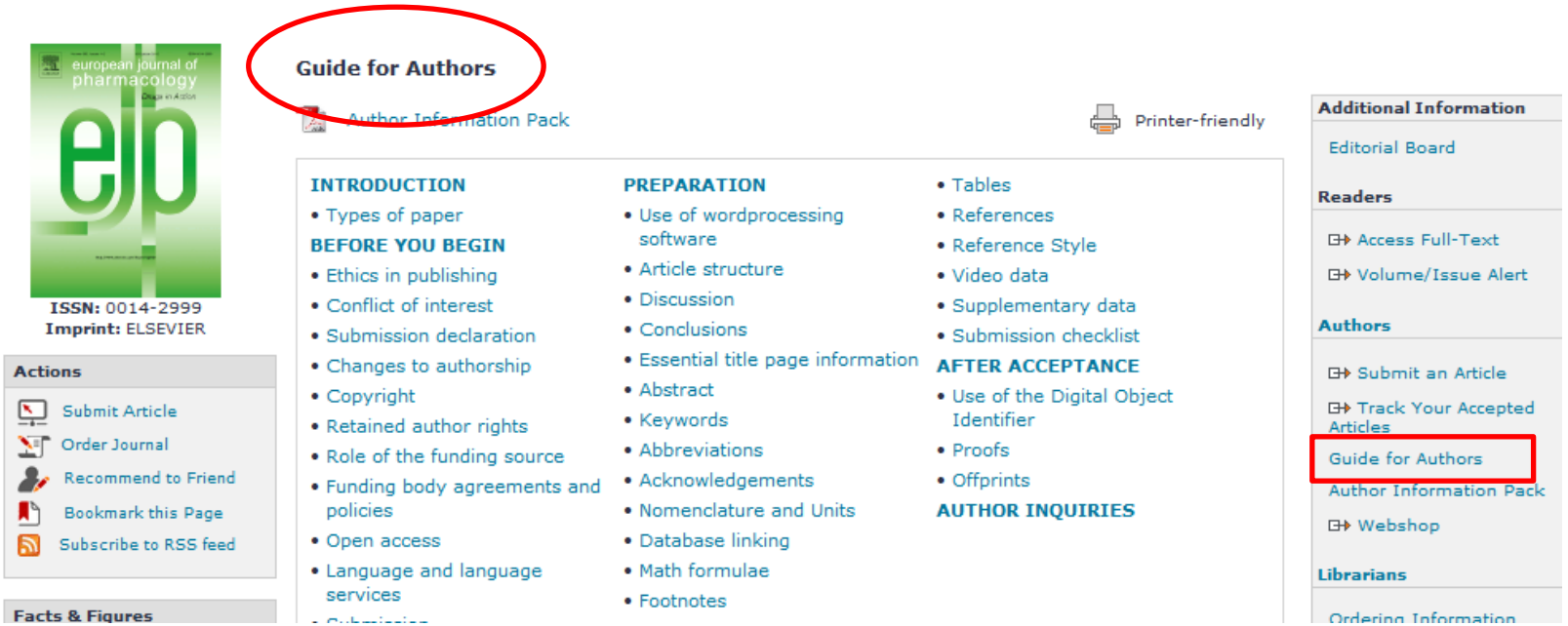



**H-index** An h-index of 8 tells you that an author published 8 articles that were cited at least 8 times *since publication*

# Read the Guide for Authors! Then read it again…

- **Stick to the Guide for Authors in your manuscript, *even in the first draft:* text layout, nomenclature, figures & tables, references, etc..**
  **In the end it will save your time and that of the editor.**
- **Editors (and reviewers) do not like wasting time on poorly prepared manuscripts. It is a sign of disrespect and sloppiness on your part.**



# General structure of a research article

- Title
- Abstract
- Keywords

Make them easy for indexing and searching! (informative, attractive, effective).

- Main text (IMRAD)
  - Introduction
  - Methods
  - Results
  - And
  - Discussions

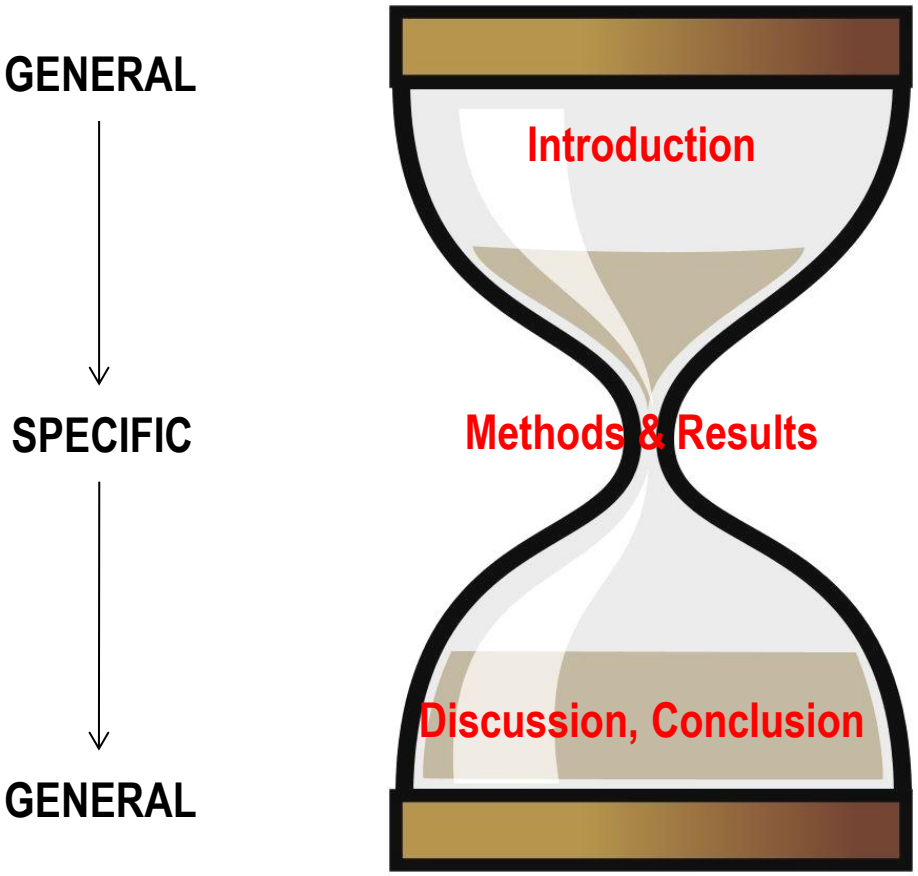
Journal space is not unlimited.

Make your article as concise as possible.

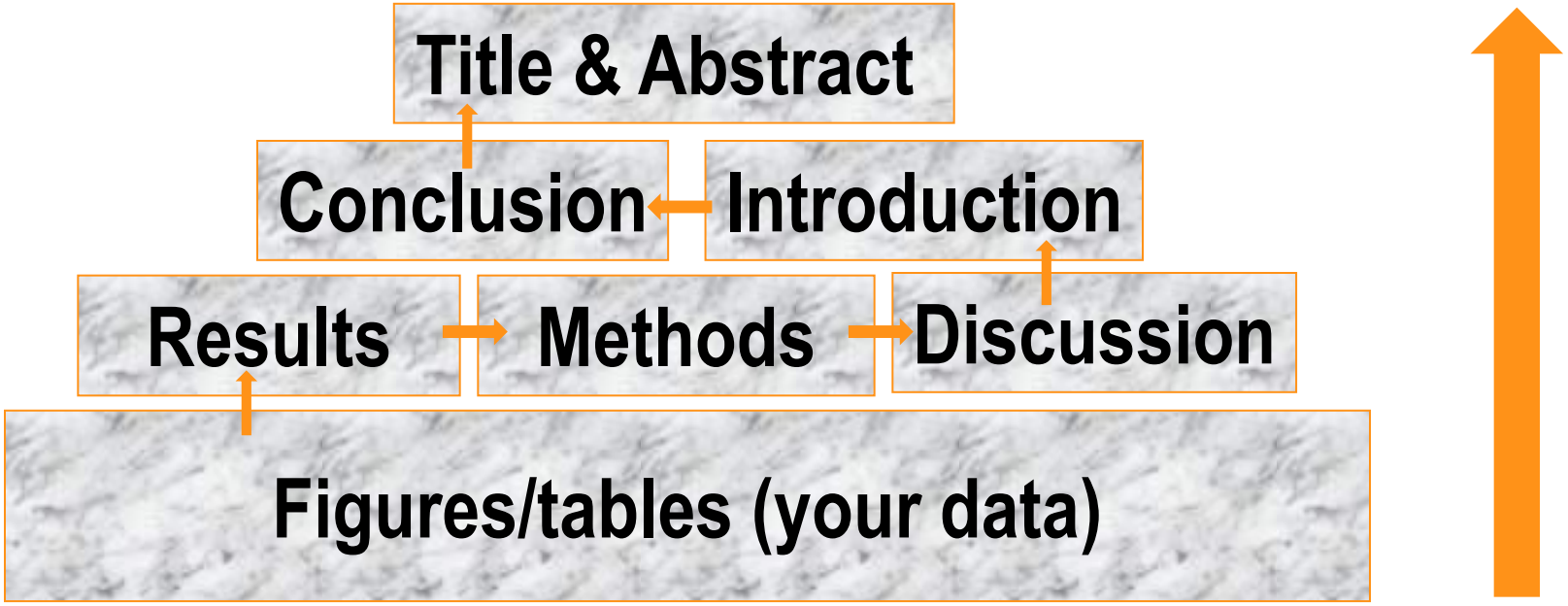
- Conclusions
- Acknowledgements
- References
- Supplementary Data

# Work in progress: how it will look

## The final article



# The process of writing: building the article



# Authorship

- Policies regarding authorship can vary
- One example: the International Committee of Medical Journal Editors ('Vancouver Group') declared that an author must:
  - *Substantially contribute* to conception and design, acquisition of data, or analysis and interpretation of data
  - *Draft* the article or *revise* it critically for important intellectual content; and
  - *Give approval* of the final full version to be published
  - *ALL three* conditions must be fulfilled to be an author!

**All others would qualify as 'Acknowledged Individuals'**

# Authorship: order & abuses

## General principles for who is listed first

### First Author

- Conducts and/or supervises the data generation and analysis & the proper presentation and interpretation of the results
- Puts the paper together and submits the paper to a journal

### Corresponding author

- The first author or a senior author from the institution
  - Particularly when the first author is a Ph.D. student or postdoc, and may move to another institution soon

## Avoid

### Ghost Authorship

- leaving out authors who should be included

### Gift Authorship

- including authors who did not contribute significantly

# Author names: common problems

- Different Spellings
  - Järvinen / Jaervinen / Jarvinen
  - Lueßen / Lueben / Luessen
  - van Harten / Vanharten / Van
- First/Last Names
  - Asian names often difficult for Europeans or Americans
- What about in the case of marriage/divorce?

- Be consistent!
  - If you are not, how can others be?

# Title

- A good title should contain the ***fewest*** possible words that ***adequately*** describe the content of a paper
- Effective titles
  - Identify the main issue of the paper
  - Begin with the subject of the paper
  - Are accurate, unambiguous, specific, and complete
  - Are as short as possible
- Articles with short, catchy titles are often better cited
- Do not contain rarely-used abbreviations
- Attract readers

# Keywords

- In an ‘electronic world’, keywords determine whether your article is found or not!
- Avoid making them:
  - too general: pharmacology, mouse, disease, etc.
  - too narrow: so that nobody will ever search for them
- Effective approach:
  - Look at the keywords of articles relevant to your manuscript
  - Play with these keywords, and see whether they return relevant papers, neither too many nor too few

# Abstract

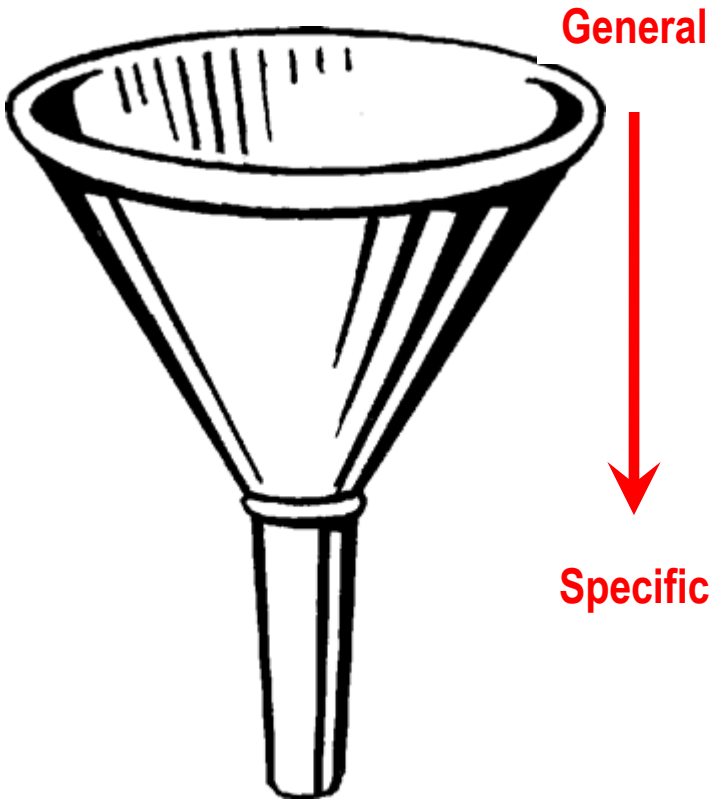
- Is freely available in electronic abstracting & indexing services
  - PubMed, Medline, Embase, Scopus...
- Provides a short description of perspective and purpose of the paper
  - Does not overemphasize the perspective by providing a literature review
- Gives key results
  - Minimal experimental details
- Includes a short description of the interpretation & conclusions

# Introduction

**The place to convince readers that you know why your work is relevant & of interest for them**

**Answer a series of questions:**

- What is the problem?
- Are there any existing solutions?
- Which one is the best?
- What is its main limitation?
- What do you hope to achieve?



# Methods/Experimental

- Include all important details so that readers can reproduce the work
  - Details that were previously published can be omitted but include a general summary of those experiments
- Give vendor names (and addresses) of equipment etc. used
- Identify all chemicals used
  - Do not use proprietary, unidentifiable compounds without description
- Present proper control experiments
- Avoid adding comments and discussion
- Write in the past tense
  - Use of active or passive voice depends on the journal
- Consider use of Supplementary Materials
  - Documents, spreadsheets, audio, video...

***Reviewers will criticize incomplete or incorrect descriptions, and may even recommend rejection***

# Ethics committee approval

- Experiments on humans or animals must follow applicable ethics standards
  - e.g., most recent version of the Helsinki Declaration and/or relevant (local, national, international) animal experimentation guidelines
- Approval of the local ethics committee is required, and should be specified in the manuscript
- Editors can make their own decisions as to whether the experiments were done in an ethically acceptable manner
  - Sometimes local ethics approvals are way below internationally accepted standards

# Results: what have you found?

## The following should be included:

- The *main findings*
  - Not *ALL* findings
  - Findings from experiments described in the Methods section
- Highlight findings that *differ* from findings in previous publications and *unexpected* findings
- Results of the *statistical analysis*

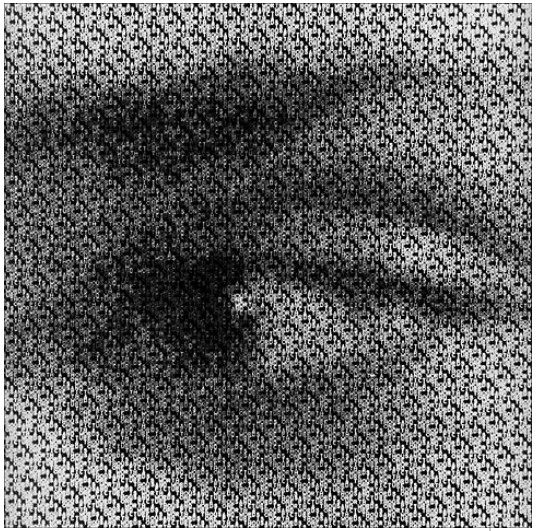
# Results: figures & tables

- Illustrations are critical because
  - Figures and tables are the most efficient way to present results
    AND
  - Results are the driving force of the publication

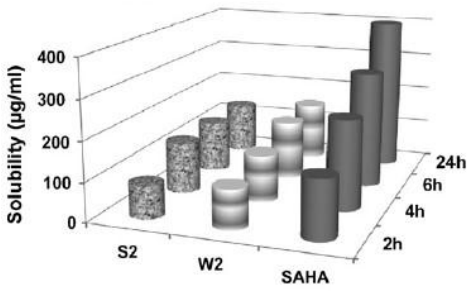
- Captions and legends must be detailed enough to make figures and tables self-explanatory

- No duplication of results described in text or other illustrations

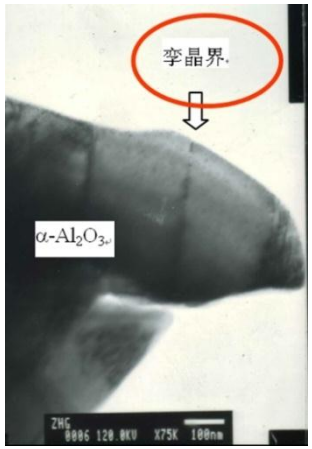
*"One Picture is Worth a Thousand Words"*
*Sue Hanauer (1968)*

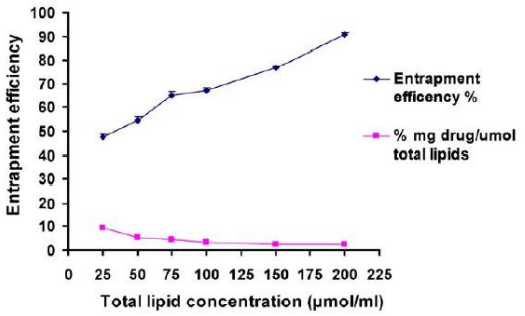


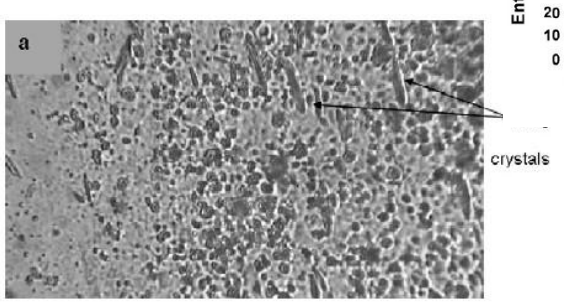
# Results: appearance counts!




- Un-crowded plots
  - 3 or 4 data sets per figure; well-selected scales; readable axis label size; clear symbols; data sets easily distinguishable
- Each photograph must have a scale marker of professional quality in a corner
- Text in photos / figures in English
  - Not in French, German, Chinese, Korean...
- Use color *ONLY* when necessary
  - If different line styles can clarify the meaning, then never use colors or other thrilling effects
- Color must be visible and distinguishable when printed in black & white
- Do not include long boring tables!



# Discussion: what do the results mean?

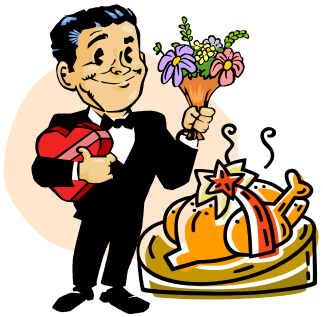
- **Check for the following:**
  - How do your results relate to the original question or objectives outlined in the Introduction section?
  - Do you provide interpretation for each of your results presented?
  - Are your results consistent with what other investigators have reported? Or are there any differences? Why?
  - Are there any limitations?
  - Does the discussion logically lead to your conclusion?
- **Do not:**
  - Make statements that go beyond what the results can support
  - Suddenly introduce new terms or ideas

# Conclusions

- Present global and specific conclusions
- Indicate uses and extensions if appropriate
- Suggest future experiments and indicate whether they are underway
- Do not summarize the paper
  - The abstract is for that purpose
- Avoid bold judgments about impact

# References: get them right!

- **Adhere to the *Guide for Authors* of the journal**
  - It is your responsibility, not of the Editors, to format references correctly!
- **Check**
  - Referencing style of the journal
  - The spelling of author names, the year of publication
  - Punctuation use
  - Use of “et al.”: “et al.” = “and others”
- **Avoid citing the following if possible:**
  - Personal communications, unpublished observations, manuscripts not yet accepted for publication
    - Editors may ask for such documents for evaluation of the manuscripts
  - Articles published only in the local language, which are difficult to find for international readers



# Supplementary material

- Data of secondary importance for the main scientific thrust of the article
  - e.g., individual curves, when a representative curve or a mean curve is given in the article itself
- Or data that do not fit into the main body of the article
  - e.g., audio, video...
- Not part of the printed article
  - Will be available online with the published paper
- Must relate to and support the article

# Typical length of a full length article

- Not the same for all journals, even in the same field
- "…25- 30 pages is the typical length for a submitted manuscript, including ***ESSENTIAL*** data only."

| | |
|---|---|
| Title page | |
| Abstract | 1 paragraph |
| Introduction | 1.5-2 manuscript pages (double-spaced, 12pt) |
| Methods | 2-4 manuscript pages |
| Results and Discussion | 10-12 manuscript pages |
| Conclusions | 1-2 manuscript pages |
| Figures | 6-8 |
| Tables | 1-3 |
| References | 20-50 |

- Letters or short communications have a stricter size limitation
  - e.g., 3000 words and no more than 5 figures/tables

# Abbreviations

- Abbreviations must be defined **on the first use**
  - In abstract as well as main text
  - Some journals do not allow the use of abbreviations in the abstract
- Abbreviations that are **firmly established** in the field do not need to be defined
  - e.g., DNA
- Never define an abbreviation of a term that is only used once
- Avoid acronyms, if possible
  - Abbreviations that consist of the initial letters of a series of words
  - Can be typical “lab jargon”, incomprehensible to outsiders

# Cover letter

Your chance to speak to the Editor directly

- View it as a job application letter
  - You want to give your work the best possible shot
- WHY did you submit the manuscript to *THIS* journal?
  - Do not summarize your manuscript, or repeat the abstract
- Suggest suitable reviewers
  - Not from your own inner circle
  - You can also mention who should not review your paper, and why
- Mention and explain conflicts of interest, if applicable

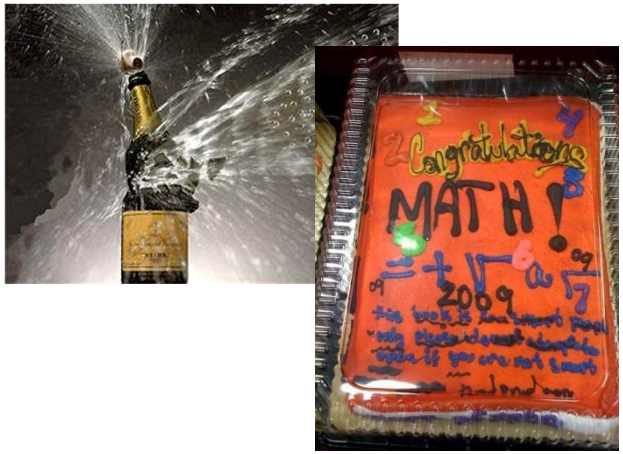
# Do everything you can to make your submission a success

- **No one gets it right the first time!**
  - Write, and re-write…
- **Suggestions**
  - After writing a first version, take several days of rest; come back with a self-critical, fresh view
  - Ask colleagues and supervisor to review your manuscript. Ask them to be highly critical and *be open to their suggestions*.

# First decision: 'Accepted' or 'Rejected'

## Accepted

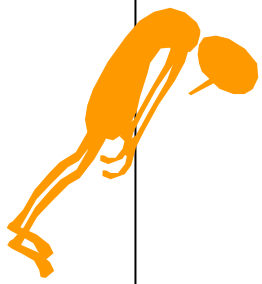
- Very rare, but it happens




- Congratulations!
  - Cake for the department
  - Now wait for page proofs and then for your article online and in print

## Rejected

- Probability 40-90%...
- Do not despair
  - It happens to everybody
- Try to understand **WHY**
  - Consider reviewers' advice
  - Be self-critical
- If you submit to another journal, begin as if it were a new manuscript
  - Take advantage of the reviewers' comments. *They may review your (resubmitted) manuscript again!*
  - **Read the Guide for Authors** of the new journal, again and again



# First decision: ‘Major’ and ‘Minor’ revisions

## Minor revision

- Basically, the manuscript is worth to be published
- Some elements in the manuscript must be clarified, restructured, shortened (often) or expanded (rarely)
- Textual adaptations
- ‘Minor revision’ does **NOT** guarantee acceptance after revision!

## Major revision

- The manuscript may finally be published in the journal
- Significant deficiencies must be corrected before acceptance
- Usually involves (significant) textual modifications and/or additional experiments

# Manuscript resubmission

## Prepare a detailed Response Letter

- Copy-paste each reviewer comment, and type your response below it
- State specifically which changes you made to the manuscript
  - Include page/line numbers
  - No general statements like “Comment accepted, and Discussion changed accordingly.”
- Provide a scientific response to comments to accept, .....
- ..... or a convincing, solid and polite rebuttal when you feel the reviewer was wrong
- Write in such a manner, that your response can be forwarded to the reviewer without prior editing

## Do not do yourself a disfavour, but cherish your work

- You spent weeks and months in the lab or the library to do the research
- It took you weeks to write the manuscript

*Why run the risk of avoidable rejection by not taking manuscript revision seriously?*

# Resubmission without/with track changes

power. The good results obtained for CL were confirmed also for MRT: average fold-error was 2.28, with 51% and 78% predicted within 2- and 3-fold of observed, respectively (rmse and me were 3.70 and -0.59, respectively). The predictions were more biased in case of $V_{ss}$: average fold-error was 3.20, with 30% and 58% predicted within 2- and 3-fold of observed, respectively (rmse and the me were 3892 and -160, respectively). For the terminal half-life average fold-error was 5.4. Twenty-five predictions out of 45 were underestimated by a factor of 2 or more and only one estimation was overestimated by more than 2.

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# How *NOT* to win the hearts & minds of Editors

"I am sorry, I must send an appeal against your criminal letter. Your sent e-mail is not an editorial answer, but only an explanation of the inquisitor, who by criminal pseudo-arguments is saving place in journal for his protected clients.

*[…..]*

I am absolutely convinced that your approach used in a case of my manuscript which is preferring words over the content, meaning, hypothesis and theory is the most reductionist, and therefore most primitive and stupid methodology which I can even to imagine ! It has nothing to do with the science!

*[…..]*

I advice you to change work-profile, because being an inquisitor is not only big shame, but brings also big damages to science.

*[…..]*

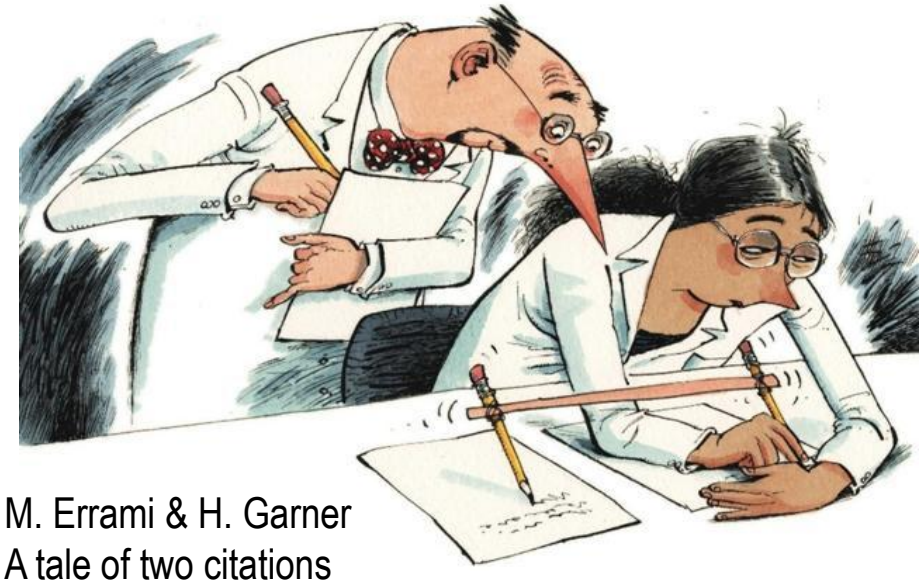
The criminal counterselection which you have shown in my case is now causing the decay of the Western Civilization's power.

You are only a Finite Prejudice Machine!"

*Email from dissatisfied author to editor, 2012*

# Publish *AND* perish: if you break ethics rules

- International scientific ethics has evolved over centuries, and are commonly held throughout the world
- Scientific ethics are not considered to have national variants or characteristics
  - there is a *single ethics standard* for science
- Ethics problems with scientific articles are on the rise ***globally***



M. Errami & H. Garner
A tale of two citations
Nature 451 (2008): 397-399

# Detection of plagiarism & fraud

- **Elsevier is participating in 2 plagiarism detection schemes**
  - Turnitin (for universities) & iThenticate (for publishers and corporations)
  - Manuscripts are checked against a database of 20 million peer reviewed articles which have been donated by 50+ publishers, including Elsevier.
  - All post-1994 Elsevier journal content is included, and pre-1995 content is being added week-by-week
- **Editors and reviewers**
- **Your own colleagues**
- **"Other“ whistleblowers**
  - “The walls have ears", it seems ...

# Publication ethics: how it can end…

"***I deeply regret*** the inconvenience and agony caused to you by my mistake and request and beg for your pardon for the same. As such ***I am facing lot many difficulties in my personal life*** and request you not to initiate any further action against me.
I would like to request you that all the correspondence regarding my publications may please be sent to me directly so that I can reply them immediately. To avoid any further controversies, ***I have decided not to publish any of my work in future***."

*E-mail from a "pharma" author*

ELSEVIER

ScienceDirect

doi:10.1016/j.sigpro.2005.07.019 Cite or Link Using DOI


# RETRACTED: Matching pursuit-based approach for ult

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[b]Signal Theory and Communications Department, University of Alcalá, Alcalá, Madrid,

Available online 24 August 2005.

This article has been retracted at the request of the Editor-in-Chief and Publisher.
http://www.elsevier.com/locate/withdrawalpolicy.

Reason: This article is virtually identical to the previously published article: "New algorithm for SNR improvement in ultrasonic NDT" , *Independent Nondestructive International*, volume 38 (2005) 453 – 458 authored by N. Ruiz-Reyes, P. Vera-Ca Mata-Campos and J.C. Cuevas-Martínez.

Corresponding author. Tel.: +34 953648554; fax: +34 953648508.

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the echoes issuing from the flaws to be detected. Therefore, it cannot be cancelled by classical time averaging or matched band-pass filtering techniques.

Many signal processing techniques have been utilized for signal-to-noise ratio (SNR) improvement in ultrasonic NDT of highly scattering materials. The most popular one is the split spectrum processing (SSP) [1–3], because it makes possible real-time ultrasonic test for industrial applications, providing quite good results. Alternatively to SSP, wavelet transform (WT) based denoising/detection methods have been proposed during recent years [4–8], yielding usually to higher improvements of SNR at the expense of an increase in complexity. Adaptive time-frequency analysis by basis pursuit (BP) [9,10] is a recent technique for decomposing a signal into an optimal superposition of elements in an over-complete waveform dictionary. This technique and some other related techniques have been successfully applied to denoising ultrasonic signals co taminated with grain noise in highly scatter materials [11,12], as an alternative to the WT technique, the computational cost of the BP algorithm being the main drawback.

In this paper, we propose a novel matching pursuit-based signal processi method for improving SNR in ultraso NDT of highly scattering materials, such as steel and composites. Matching pursuit is used instead of BP to reduce the complexity. Due to its iterative nature, the method is fast enough to be real-time implemented. The performance of the proposed method has been evaluated using both computer simulation and experimental results, when the input SNR (SNRin) is lower than 0dB (the level of echoes containing microstructures is above the level of the echoes).

## 2. Matching pursuit

Matching pursuit was introduced by Mallat and Zhang [13]. Let us suppose an approximation of the ultrasonic backscattered signals $x[n]$ as a linear expansion in terms of functions $g_i[n]$ chosen from an over-complete dictionary. Let H be a Hilbert space. We define the over-complete dictionary as a family $D = \{g_i;\ i = 0, 1, \ldots, L\}$ of vectors in H, such as $\|g_i\| = 1$.

The problem of choosing functions $g_i[n]$ that best approximate the analysed signal $x[n]$ is computationally very complex. Matching pursuit is an iterative algorithm that offers sub-optimal solutions for decomposing $x[n]$ as terms of expansion functions chosen from a dictionary, where $l^2$ norm is used as the approximation metric because of its mathematical convenience. When a well-designed dictionary is used in matching pursuit, the non-linear nature of the algorithm leads to compact and relevant models.

In each step of the iterative procedure, vector $g_i[n]$ which gives the largest inner product with the analysed signal is chosen. The contribution of this vector is then subtracted from the signal and the process is repeated on the residual. At the $m$th iteration the residue is

$$r^m[n] = \begin{cases} x[n], & m = 0, \\ r^{m-1}[n] + a_{g_{i(m)}} g_{i(m)}[n], & m \neq 0, \end{cases} \quad (1)$$

where $a_{g_{i(m)}}$ is the weight associated to optimum atom $g_{i(m)}[n]$ at the $m$th iteration.

The weight $a_i^m$ associated to each atom $g_i[n] \in D$ at the $m$th iteration is introduced to compute all the inner products with the residual $r^m[n]$:

$$a_i^m = \frac{\langle r^m[n], g_i[n] \rangle}{\langle g_i[n], g_i[n] \rangle} = \frac{\langle r^m[n], g_i[n] \rangle}{\|g_i[n]\|^2} = \langle r^m[n], g_i[n] \rangle. \quad (2)$$

The optimum atom $g_{i(m)}[n]$ (and its weight $a_{g_{i(m)}}$) at the $m$th iteration are obtained as follows:

$$g_{i(m)}[n] = \arg\min_{g_i \in D} \|r^{m+1}[n]\|^2 = \arg\max_{g_i \in D} |a_i^m|^2 = \arg\max_{g_i \in D} |a_i^m|. \quad (3)$$

The computation of correlations $\langle r^m[n], g_i[n] \rangle$ for all vectors $g_i[n]$ at each iteration implies a high computational effort, which can be substantially reduced using an updating procedure derived from Eq. (1). The correlation updating procedure [13] is performed as follows:

$$\langle r^{m+1}[n], g_i[n] \rangle = \langle r^m[n], g_i[n] \rangle - a_{g_{i(m)}} \langle g_{i(m)}[n], g_i[n] \rangle. \quad (4)$$

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# Ethics issues in publishing ethics

## Scientific misconduct

- Falsification of results

## Publication misconduct

- Plagiarism
  - Different forms / severities
  - The paper must be original to the authors
- Duplicate publication
- Duplicate submission
- Appropriate acknowledgement of prior research and researchers
- Appropriate identification of all co-authors
- Conflict of interest

# Figure manipulation

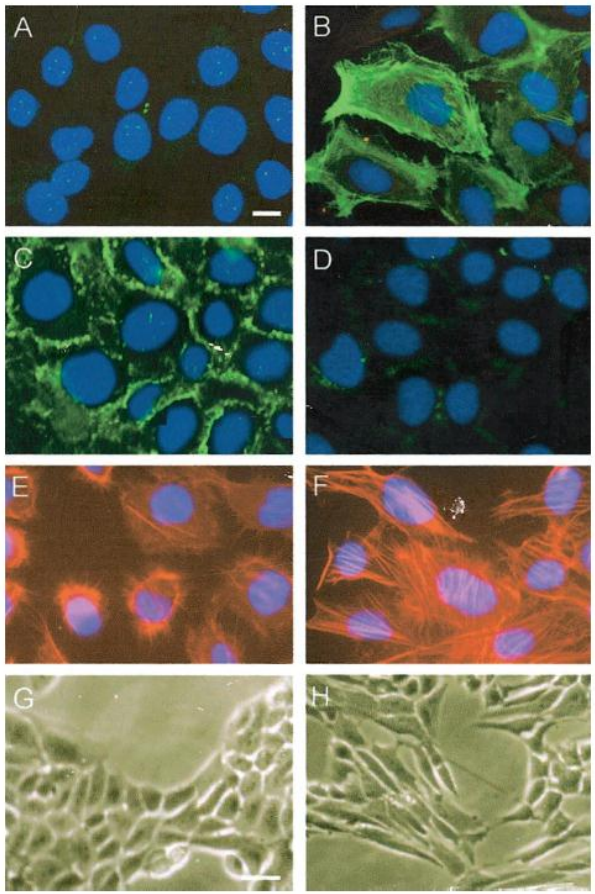
As long as they don't obscure or eliminate info present in the original image


Must be disclosed in the figure legend

# Figure manipulation: example

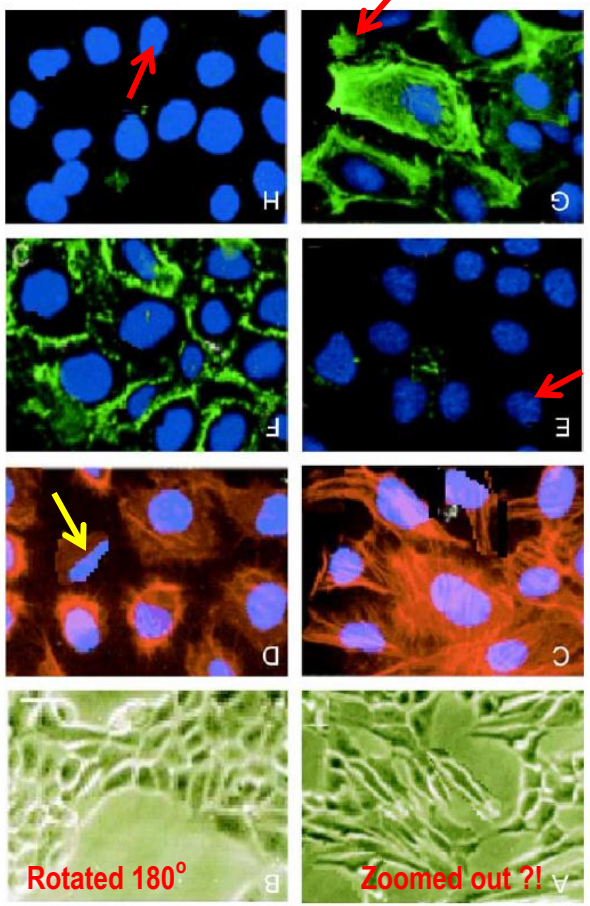
## Different authors and experiments

Am J Pathol, 2001

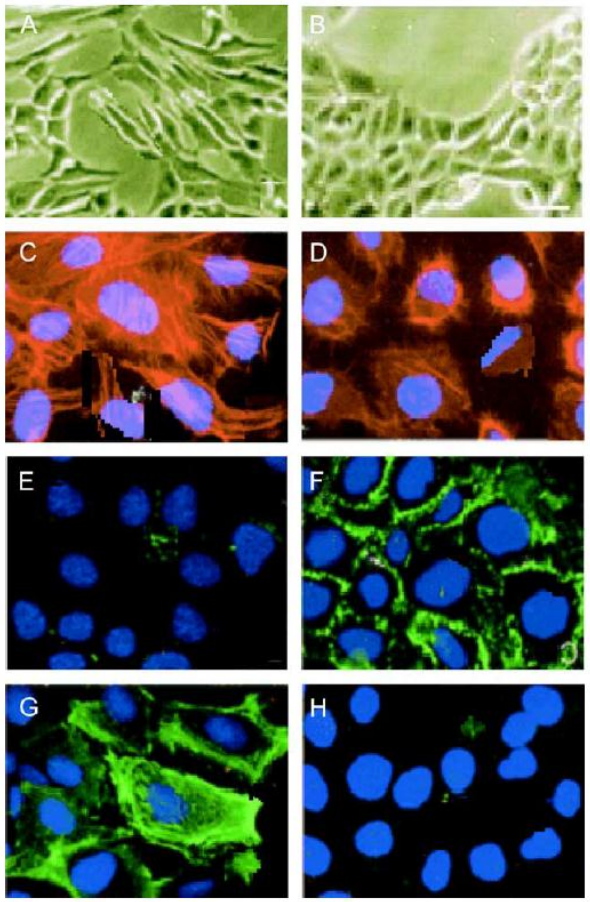



Life Sci, 2004

Rotated 180°

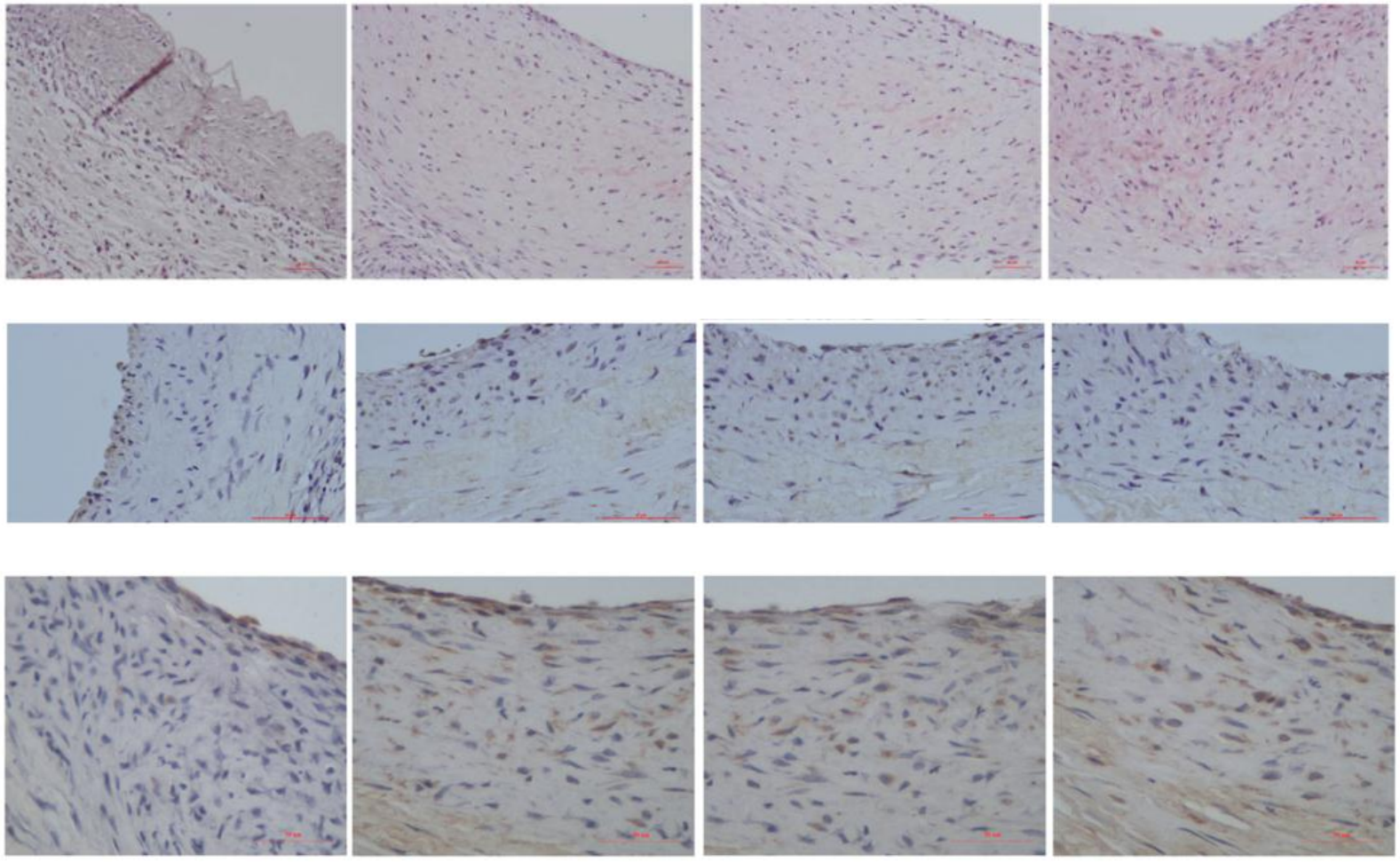



Life Sci, 2004



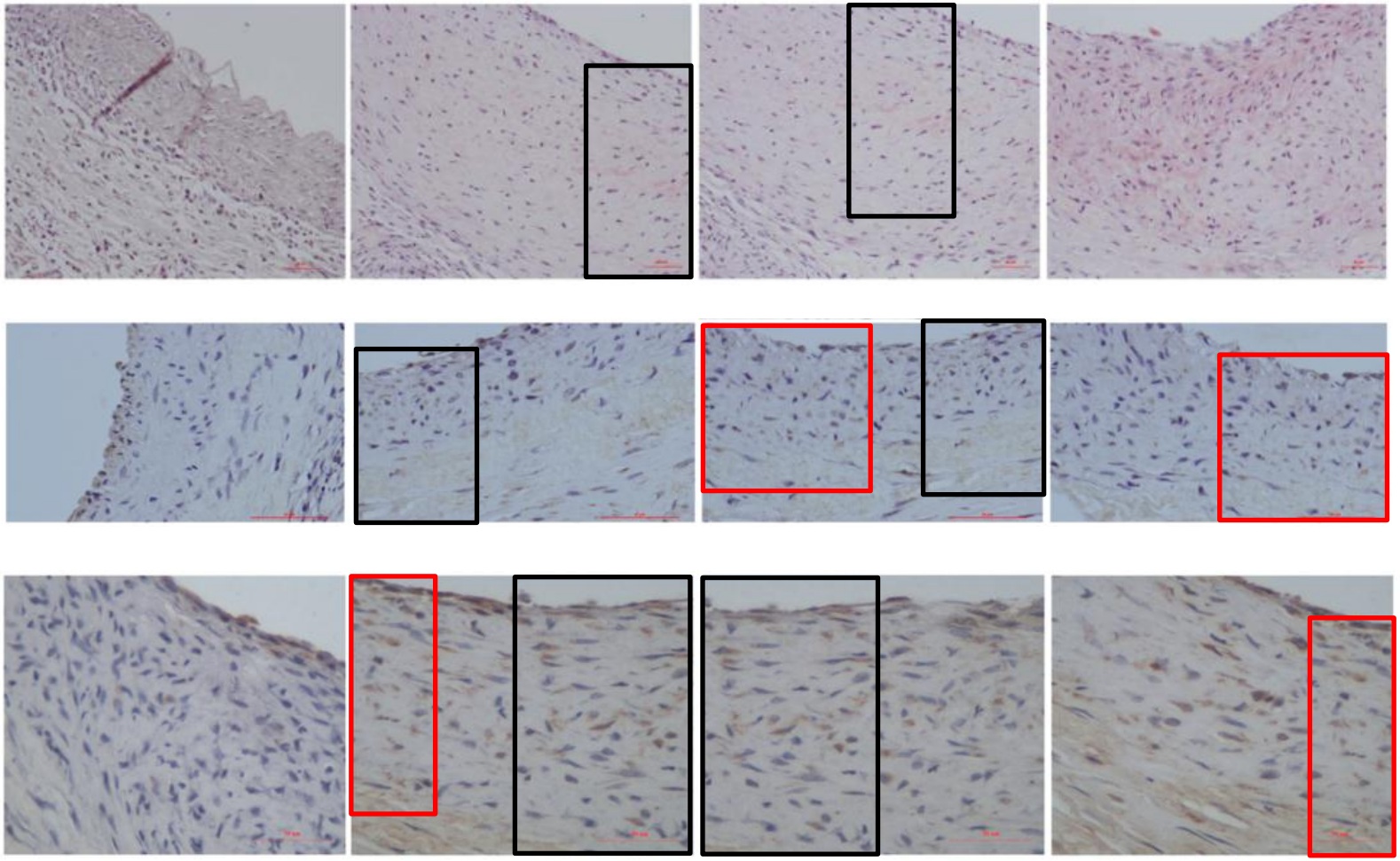
# Figure manipulation: example

## Same manuscript, different experiments



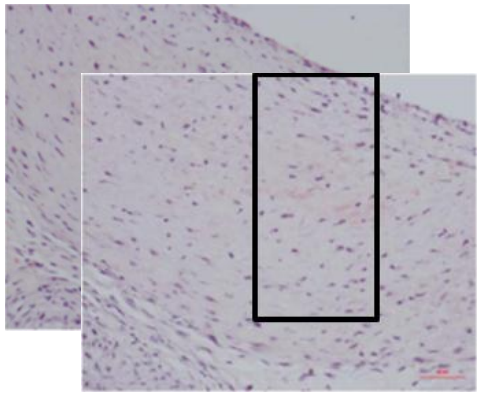
# Figure manipulation: example

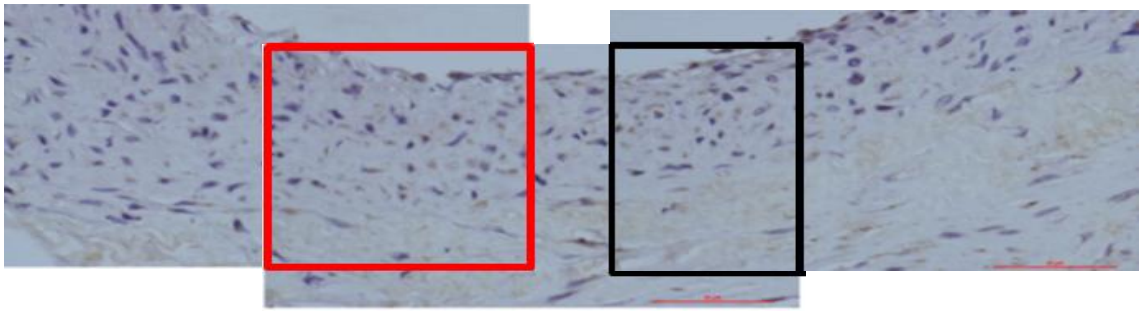
## Same manuscript, different experiments

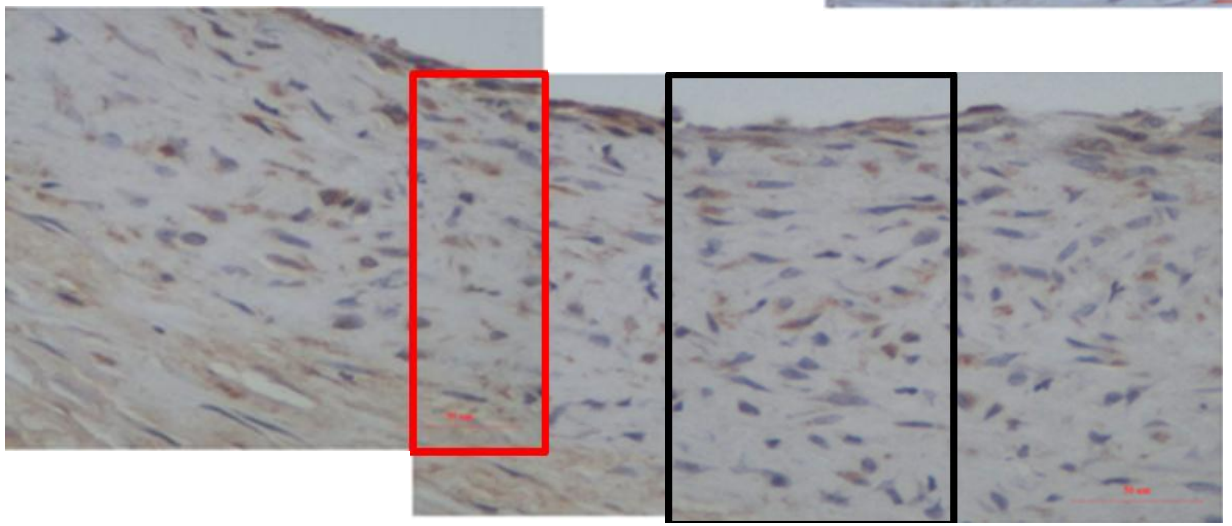


# Figure manipulation: example

## Same manuscript, different experiments

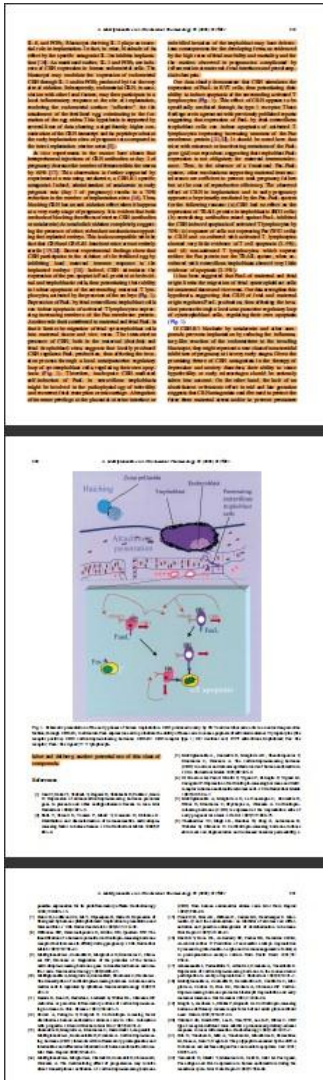






# Publication ethics: self-plagiarism

2003



Same colour left and right

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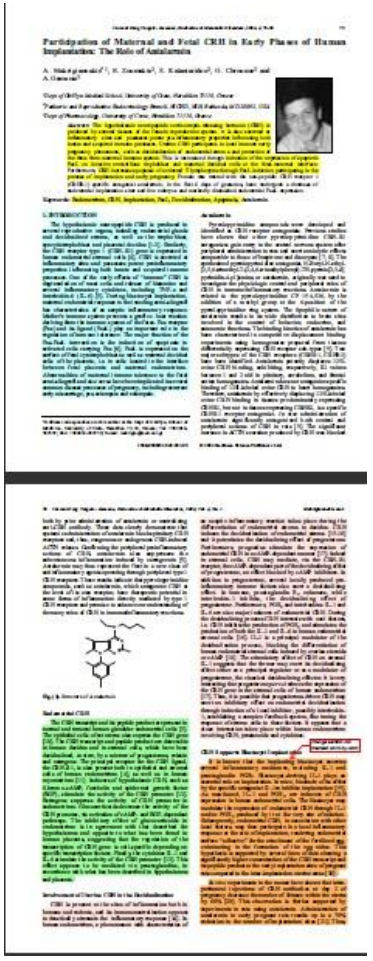
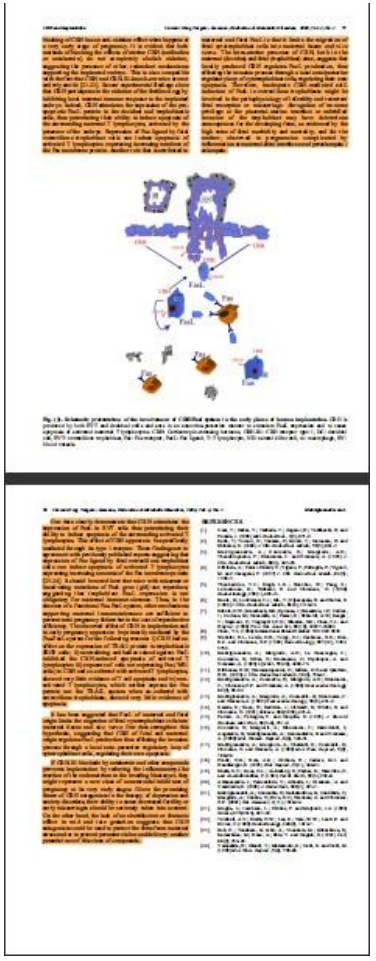
2004





# What leads to acceptance?

**A**ttention to details

**C**heck and double check your work

**C**onsider the reviewers' comments

**E**nglish must be as good as possible

**P**resentation is important

**T**ake your time with revision

**A**cknowledge those who have helped you

**N**ew, original and previously unpublished

**C**ritically evaluate your own manuscript

**E**thical rules must be obeyed

– Nigel John Cook
Editor-in-Chief, *Ore Geology Reviews*

# *Thank you!*

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