How to Get Published

Rose Olthof – Director Strategy
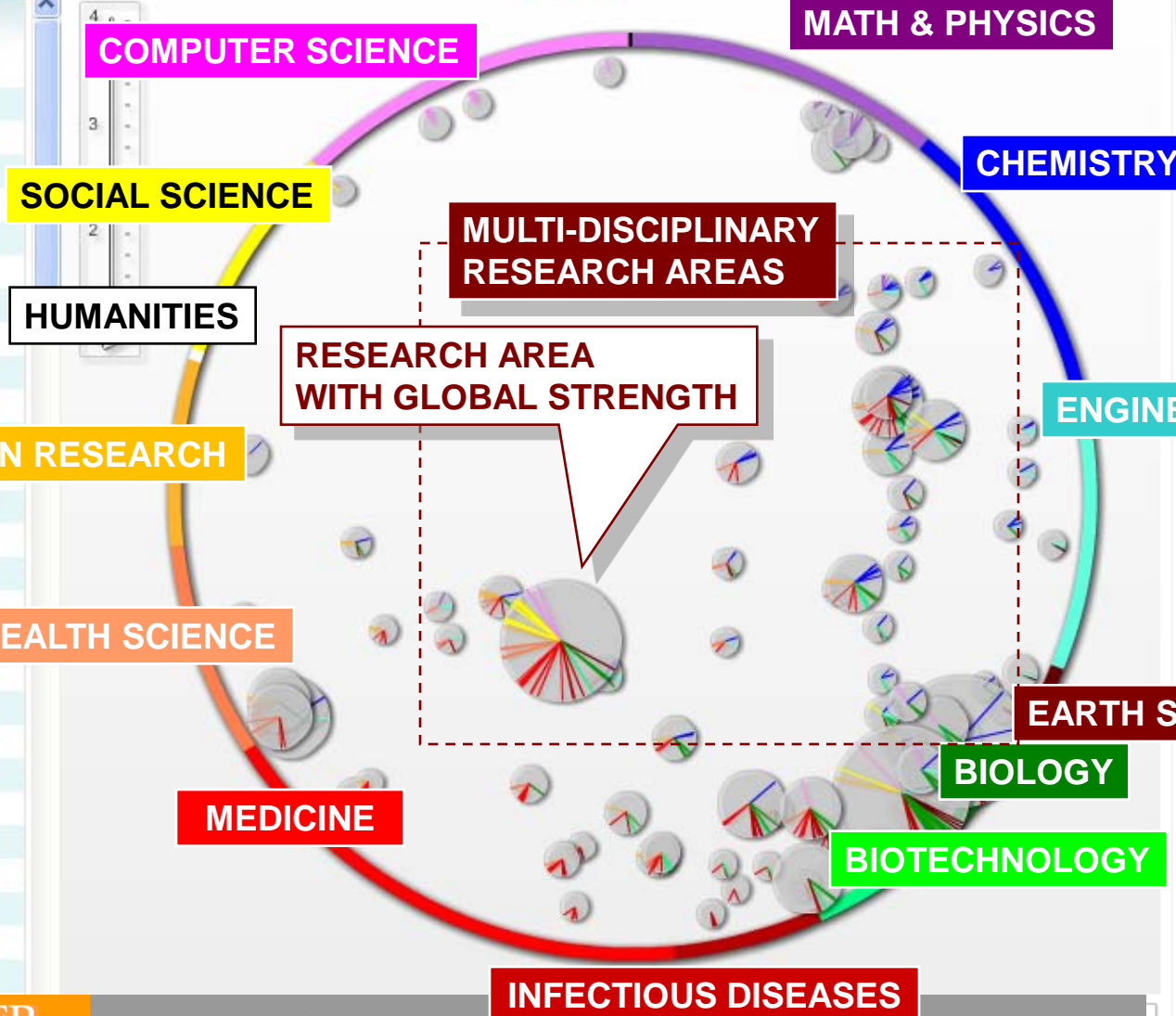
MAP OF BRAZIL: STRONG FOCUS ON BIOLOGY

Elsevier Journal publishing volume

- 1,000 new editors per year
- 20 new journals per year

- Organise editorial boards
- Launch new specialist journals

- *600,000+ article submissions per year*

- 200,000 reviewers
- 1 million reviewer reports per year

Solicit and manage submissions

Manage peer review

Archive and promote

- *11 million articles now available*

- *40%-90% of articles rejected*

Publish and disseminate

Edit and prepare

Production

ELSEVIER

- *11 million researchers*
- *5,000+ institutions*
- *180+ countries*
- *400 million+ downloads per year*
- 3 million print pages per year

- 7,000 editors
- 70,000 editorial board members
- 6.5 million author/publisher communications /year

- *280,000 new articles produced per year*
- 190 years of back issues scanned, processed and data-tagged

Examples of our 1800 journal titles

Building Insights. Breaking Bo

Your personal reason for publishing
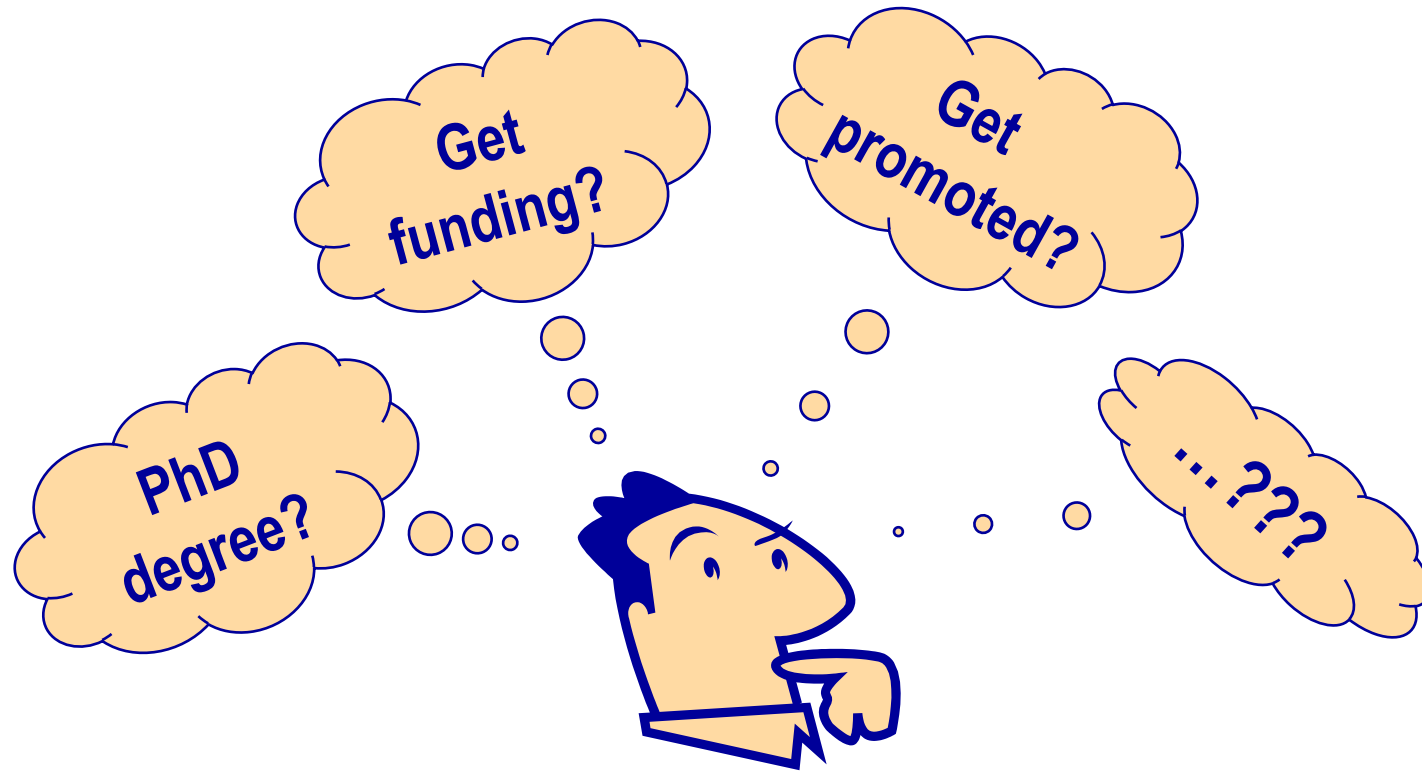
- However, editors, reviewers, and the research community don't consider these reasons when assessing your work.

Always keep in mind that …

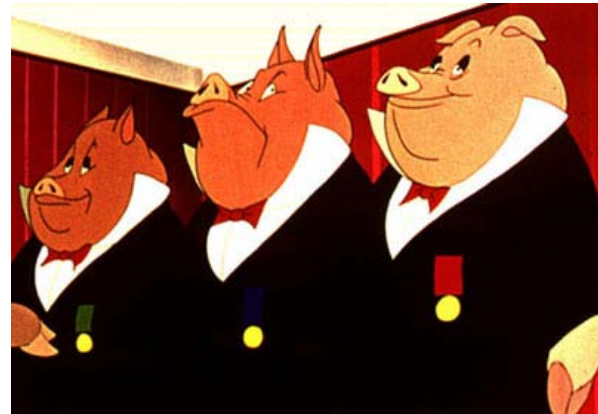### …. your paper is your passport
to your community !

Thought Question

What is it that distinguishes an excellent article from a poor one?

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

Determine if you are ready to publish

You should consider publishing if you have information that advances understanding in a certain scientific field

This could be in the form of:

- Presenting new, original results or methods
- Rationalizing, refining, or reinterpreting published results
- Reviewing or summarizing a particular subject or field

If you are ready to publish, a <u>strong</u> manuscript is what is needed next

What is a strong manuscript?

- Has a <u>novel</u>, <u>clear</u>, <u>useful</u>, and <u>exciting</u> message

- Presented and constructed in a <u>logical</u> manner

- Reviewers and editors can grasp the scientific significance <u>easily</u>

Editors and reviewers are all busy scientists – make things easy to save their time

Type of your manuscript?

- Full articles/Original articles;

- Letters/Rapid Communications/Short communications;

- Review papers/perspectives

- Self-evaluate your work: Is it sufficient for a full article? Or are your results so thrilling that they need to be shown as soon as possible?

- Ask your supervisor and colleagues for advice on manuscript type. Sometimes outsiders see things more clearly than you.
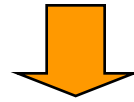
Choose the right journal
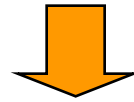
Do not just "descend the stairs"

Top journals

    Nature, Science, Lancet, NEJM, ...

⬇

Field-specific top journals

⬇

Other field-specific journals

⬇

National journals

Impact Factor

- The number of current citations to articles published in a specific journal in a two year period
  - In 2009 there were <u>200</u> citations to papers published in 2008 and <u>275</u> to papers published in 2007.
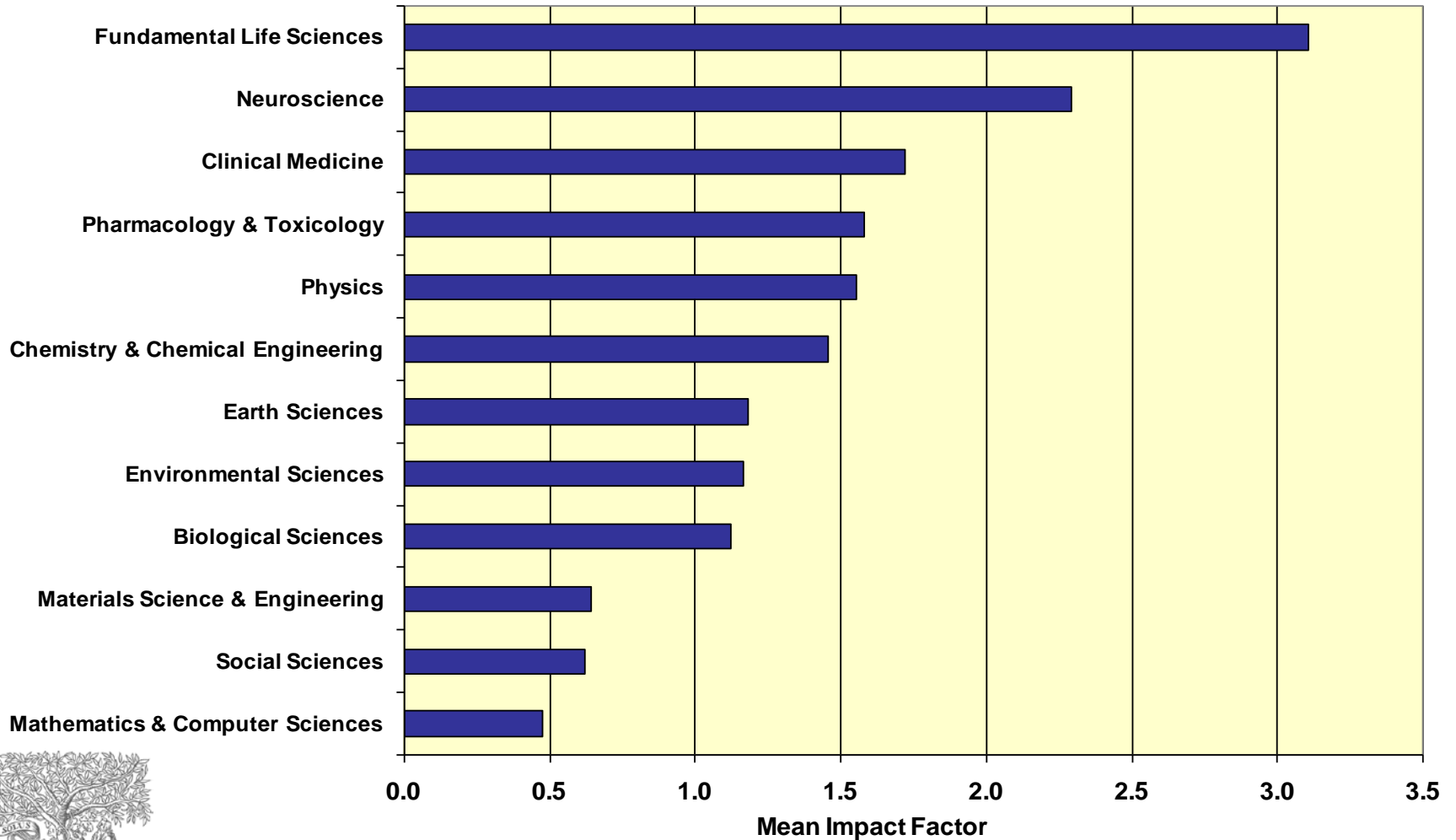
divided by

- The total number of articles published in the same journal in the corresponding two year period.
  - The journal published <u>180</u> articles in 2007, and <u>205</u> in 2008

Impact factor 2009 for this journal is:

$$(200+275)/(180+205) = 1.233$$

Influences on Impact Factors: Subject Area

Horizontal bar chart titled "Mean Impact Factor" showing the following subject areas and approximate mean impact factor values:

Subject Area	Mean Impact Factor
Fundamental Life Sciences	~3.1
Neuroscience	~2.3
Clinical Medicine	~1.7
Pharmacology & Toxicology	~1.6
Physics	~1.55
Chemistry & Chemical Engineering	~1.45
Earth Sciences	~1.2
Environmental Sciences	~1.15
Biological Sciences	~1.1
Materials Science & Engineering	~0.65
Social Sciences	~0.6
Mathematics & Computer Sciences	~0.48

Alternative calculation of the IF…

Additional metrics

- SciVal Spotlight

- SCImago Journal & Country Ranking (http...

- SNIP

- Hirsch Index / h-index

- Journal Analyzer

- Eigenfactor (http://www.eigenfactor.org/)
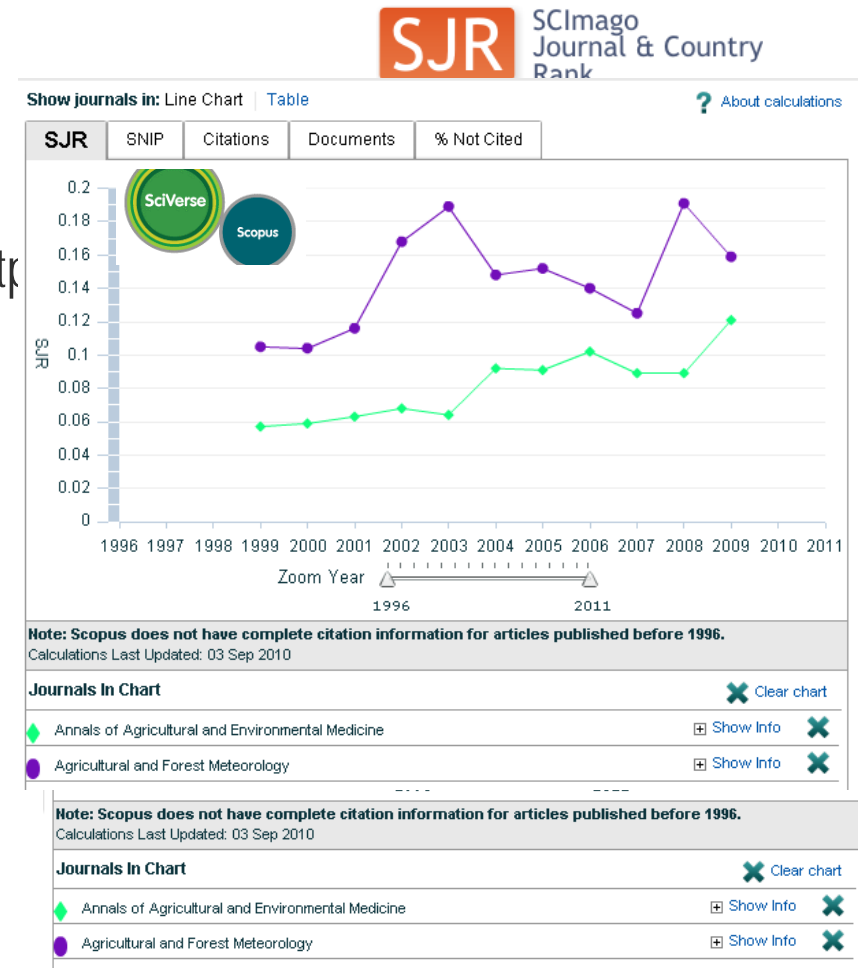
Identify the right audience for your paper

- Identify the sector of readership/community for which a paper is meant

- Identify the interest of your audience

- Is your paper of local or international interest?

Choose the right journal

- Investigate all candidate journals to find out
  - ➢ Aims and scope
  - ➢ Accepted types of articles
  - ➢ Readership
  - ➢ Current hot topics
    - – go through the abstracts of recent publications)

ELSEVIER

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BIOCHEMICAL PHARMACOLOGY

Editor-in-Chief:
S.J. Enna
See editorial board for all editors information

Sign up for the Pharmacology Newsletters Sign up here!

BCP Special Issues: Published and Future issues

January 2008 : Addictions Special Issue
Edited by David Weinshenker

Description

Biochemical Pharmacology is an international journal devoted to publishing original work on the interaction of drugs and nontherapeutic xenobiotics with biological systems. While particular emphasis is placed on reporting findings that relate to the actions and metabolism of drugs and toxic substances at the biochemical and molecular levels, submissions in the areas of behavioral and physiological pharmacology and toxicology are also encouraged if they describe studies directed at defining mechanisms of action. All areas of the field are represented in the journal including, but not limited to, cancer chemotherapy, neuropharmacology, inflammation/immunopharmacology, antimicrobials, behavioral, respiratory, gastrointestinal, cardiovascular, and endocrine pharmacology and toxicology. Submissions relating to either pharmacodynamics or pharmacokinetics are considered. Reports based on experiments conducted with mixtures, plant or animal extracts will not be considered for publication unless the chemical structures and concentrations of all substances are known. Submissions to the journal must be in English.

The journal publishes the following types of reports:
(1) **Full-length Research Papers.** These contain the results of original research on an issue of relevance to the field of pharmacology.
(2) **Commentaries.** These are commissioned articles that provide the author's view on a selected topic of

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Volume 54, Issue 2, Pages 193-318 (August 2007)

Article List   **Full Abstracts**

Display Selected Articles E-mail Articles Export Citations

SummaryPlus |

■ 1. ☐ **Editorial Board**
Page IFC
PDF (582 K)

■ 2. ☐ **Cloning, expression, purification and functional characterization of recombinant hum**
Pages 193-203
Seema Garde, Jennifer E. Fraser, Najib Nematpoor, Rebecca Pollex, Catherine Morin, A
Chandra Panchal and Madhulika B. Gupta
SummaryPlus | Full Text + Links | PDF (397 K)

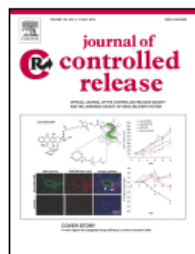**ELSEVIER**   Building Insights. Breaking Boundaries.™

Choose the right journal

- Ask help from your supervisor or colleagues
  - The supervisor (who is sometimes the corresponding author) has at least co-responsibility for your work. You are encouraged to chase your supervisor if necessary.

- Articles in your references will likely lead you to the right journal.

- DO NOT gamble by submitting your manuscript to more than one journal at a time.
  - International ethics standards prohibit multiple/simultaneous submissions, and editors DO find out! (Trust us, they DO!)

Read the 'Guide for Authors'! Again and 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 you time, and also the editor's.

- Editors (and reviewers) do not like wasting time on poorly prepared manuscripts. It is a sign of disrespect.

General Structure of a Research Article

- Title
- Abstract
- Keywords

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

- Main text (IMRAD)
  - <u>I</u>ntroduction
  - <u>M</u>ethods
  - <u>R</u>esults
  - <u>A</u>nd
  - <u>D</u>iscussions

Journal space is not unlimited.

Make your article as concise as possible.

- Conclusion
- Acknowledgement
- References
- Supplementary Data

The process of writing – building the article

Title & Abstract

Conclusion | Introduction

Methods | Results | Discussion

Figures/tables (your data)
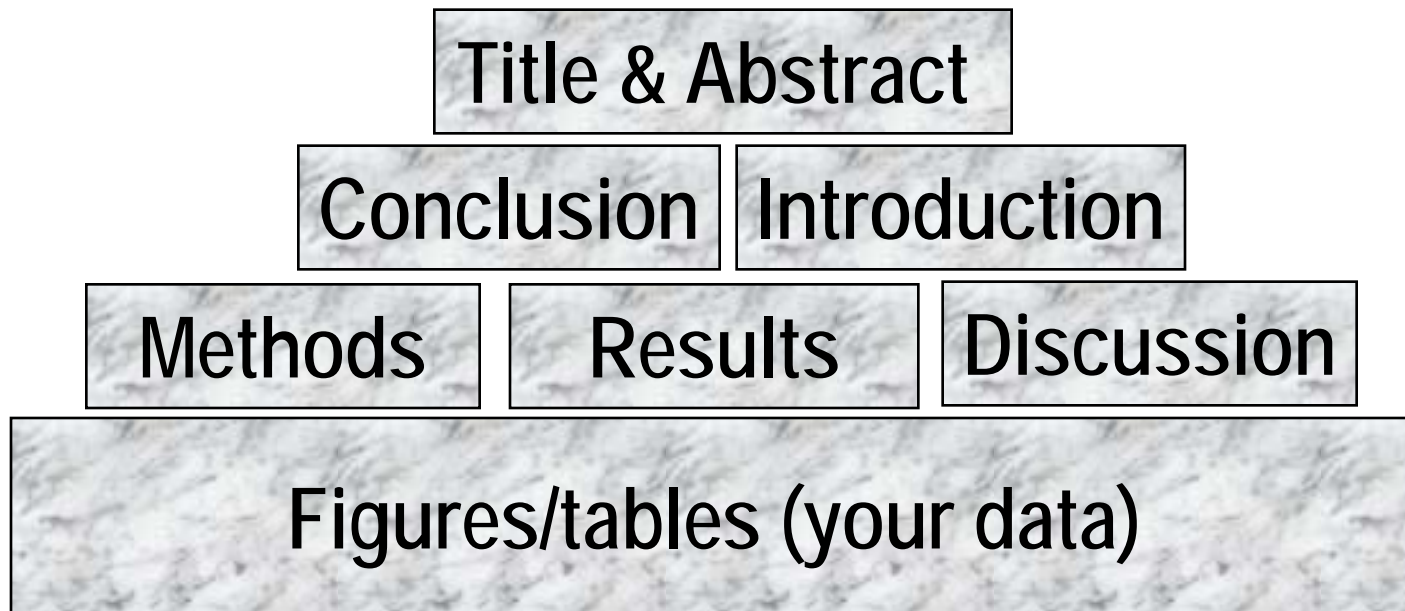
Scientific Language – Overview

Write with clarity, objectivity, accuracy, and brevity.

- Key to successful scientific writing is to be alert for common errors:
  - ➢ Sentence construction
  - ➢ Incorrect tenses
  - ➢ Inaccurate grammar
  - ➢ Not using English

Check the Guide for Authors of the target journal for language specifications

Why Is Language Important?

Save your editor and reviewers the trouble of guessing what you mean

Complaint from an editor:

"[This] paper fell well below my threshold. I refuse to spend time <u>trying to understand</u> what the author is trying to say. Besides, I really want to send a message that they can't <u>submit garbage</u> to us and expect us to fix it. My rule of thumb is that if there are more than 6 grammatical errors in the abstract, then <u>I don't waste my time</u> carefully reading the rest."

Scientific Language – Sentences

- Write direct and <u>short</u> sentences

- <u>One idea</u> or piece of information <u>per sentence</u> is sufficient

- Avoid multiple statements in one sentence

An example of what <u>NOT</u> to do:

"If it is the case, intravenous administration should result in that emulsion has higher intravenous administration retention concentration, but which is not in accordance with the result, and therefore the more rational interpretation should be that SLN with mean diameter of 46nm is greatly different from emulsion with mean diameter of 65 nm in entering tumor, namely, it is probably difficult for emulsion to enter and exit from tumor blood vessel as freely as SLN, which may be caused by the fact that the tumor blood vessel aperture is smaller."

Authorship

- Policies regarding authorship can vary

- One example: the International Committee of Medical Journal Editors ("Vancouver Group") declared that an author must:

  1. substantially contribute to conception and design, or acquisition of data, or analysis and interpretation of data;

  2. draft the article or revise it critically for important intellectual content; and

  3. give their approval of the final full version to be published.

  4. ALL 3 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
  - <u>First Author</u>
    - Conducts and/or supervises the data generation and analysis and the proper presentation and interpretation of the results
    - Puts paper together and submits the paper to journal
  - <u>Corresponding author</u>
    - The first author or a senior author from the institution
      - Particularly when the first author is a PhD student or postdoc, and may move to another institution soon.

- Abuses to be avoided
  - <u>Ghost Authors</u>: leaving out authors who should be included
  - <u>Gift Authors</u>: including authors who did not contribute significantly

Title

- A good title should contain the fewest possible words that adequately describe the contents 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

Title: Examples

Original Title	Revised	Remarks
Preliminary observations on the effect of Zn element on anticorrosion of zinc plating layer	Effect of Zn on anticorrosion of zinc plating layer	<u>Long title</u> distracts readers. Remove all <u>redundancies</u> such as "observations on", "the nature of", etc.
Action of antibiotics on bacteria	Inhibition of growth of mycobacterium tuberculosis by streptomycin	Titles should be <u>specific</u>. Think to yourself: "How would I search for this piece of information?" when you design the title.
Fabrication of carbon/CdS coaxial nanofibers displaying optical and electrical properties via electrospinning carbon	Electrospinning of carbon/CdS coaxial nanofibers with optical and electrical properties	"English needs help. The title is nonsense. All materials have properties of all varieties. You could examine my hair for its electrical and optical properties! You MUST be specific. I haven't read the paper but I suspect there is something special about these properties, otherwise why would you be reporting them?" *– the Editor-in-Chief*

Keywords

- In an "electronic world", keywords determine whether your article is found or not!

- Avoid to make them

  - too general ("drug delivery", "mouse", "disease", etc.)

  - too narrow (so that nobody will ever search for it)

- 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

Tell readers what you did and the important findings

- One paragraph (between 50-300 words)
- Advertisement for your article
- A clear abstract will strongly influence if your work is considered further

What has been done

Graphite intercalation compounds (GICs) of composition $C_xN(SO_2CF_3)_2 \cdot \delta F$ are prepared under ambient conditions in 48% hydrofluoric acid, using K_2MnF_6 as an oxidizing reagent. The stage 2 GIC product structures are determined using powder XRD and modeled by fitting one dimensional electron density profiles.

A new digestion method followed by selective fluoride electrode elemental analyses allows the determination of free fluoride within products, and the compositional x and δ parameters are determined for reaction times from 0.25 to 500 h.
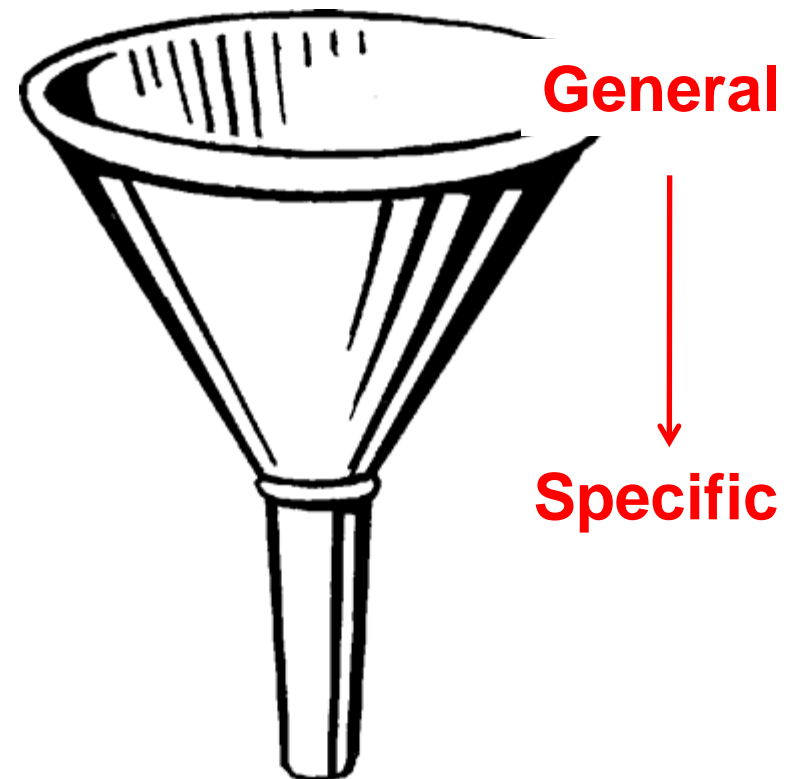
What are the main findings

Introduction

The place to convince readers that you know why your work is relevant, also 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?

General

Specific

Pay attention to the following

- Before you present your new data, put them into perspective first

- Be brief, it is not a history lesson

- Do not mix introduction, results, discussion and conclusions. Keep them separate

- Do not _overuse_ expressions such as "novel", "first time", "first ever", "paradigm shift", etc.

- Cite only relevant references

  - ➢ Otherwise the editor and the reviewer may think you don't have a clue what you are writing about

Methods / Experimental

- Include all important details so that the reader can repeat the work.
    - Details that were previously published can be omitted but a general summary of those experiments should be included
- Give vendor names (and addresses) of equipment etc. used
- All chemicals must be identified
    - Do not use proprietary, unidentifiable compounds without description
- Present proper control experiments
- Avoid adding comments and discussion.
- Write in the past tense
    - Most journals prefer the passive voice
- 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**
    - Thus not all findings
    - Findings from experiments described in the Methods section
  - Highlight findings that **differ** from findings in previous publications, and **unexpected** findings
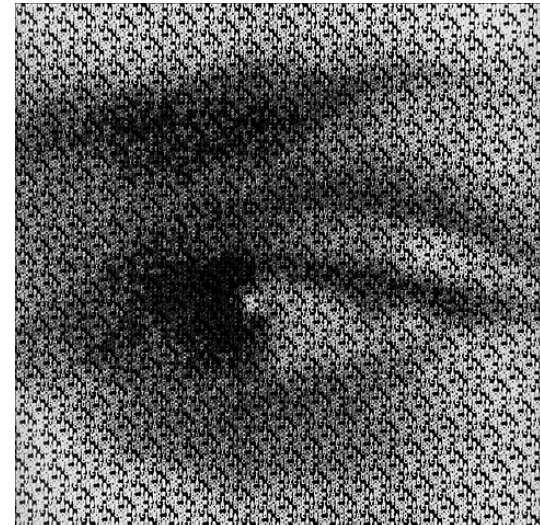 - Results of the **statistical analysis**

Results – Figures and tables

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

"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; appropriate axis label size; symbols clear to read; 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, ...
- **Use colour *ONLY* when necessary.**
  - If different line styles can clarify the meaning, then never use colours or other thrilling effects.
- **Colour must be visible and distinguishable when printed in black & white.**
- **Do not include long boring tables!**
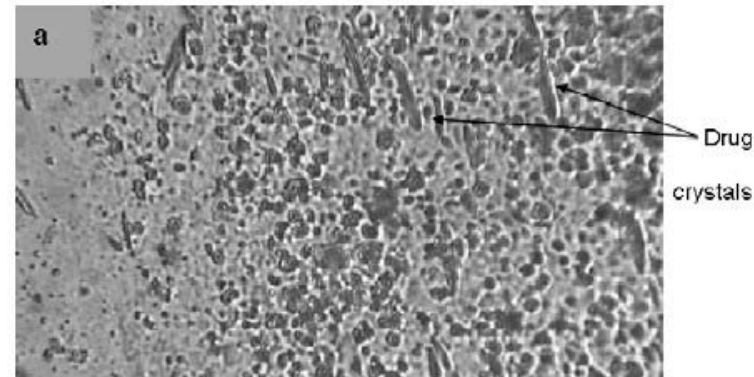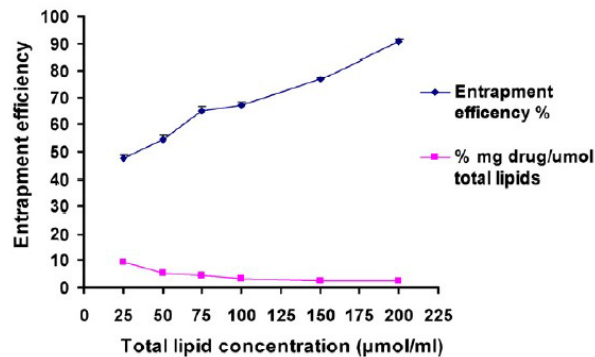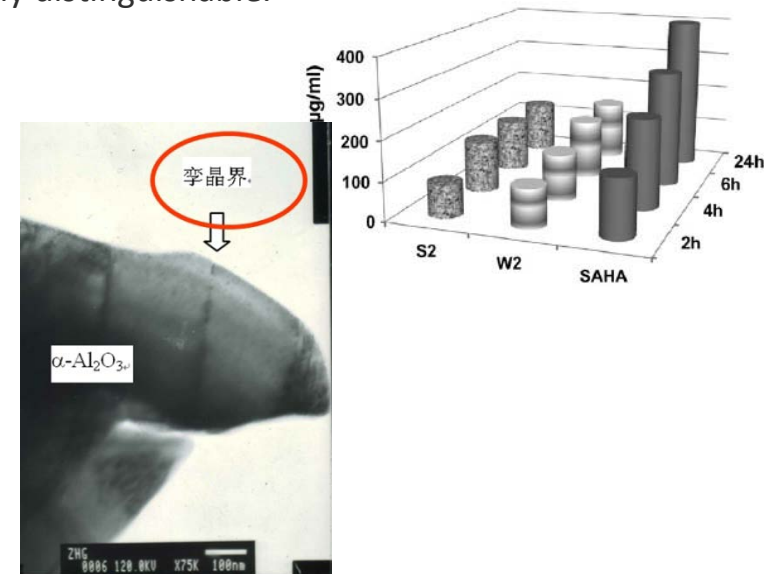
Discussion – what do the results mean?

- 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 judgments about impact

Avoid non-quantitative words, if possible

e.g. low/high, extremely, enormous, rapidly, dramatic, massive, considerably, exceedingly, major/minor, …

Quantitative descriptions are always preferred

References: get them right!

- Please **adhere to the Guide for Authors** of the journal
- It is your responsibility, not of the Editor's, 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 other**s**",

- 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 for international readers to find.

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

Suggested length of a full article

- Not the same for all journals, even in the same field

- "…25- 30 pages is the ideal 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. 3,000 words and no more than 5 figures/tables.

Abbreviations

- Abbreviations must be defined **on the first use** in **both** abstract and main text.

- Some journals even forbid 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

Make every attempt to make the first 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 critical, fresh view
  - Ask colleagues and supervisor to review your manuscript. Ask them to be highly critical, and *be open to their suggestions*.

Cover Letter

- Submit...

- Mention...nal

- Note s...of interest...

Professor H. D. Schmidt
School of Science and Engineering
Northeast State University
College Park, MI 10000
USA

January 1, 2008

Dear Professor Schmidt,

Enclosed with this letter you will find en electronic submission of a manuscript entitled "Mechano-sorptive creep under compressive loading – a micromechanical model" by John Smith and myself. This is an original paper which has neither previously nor simultaneously in whole or in part been submitted anywhere else. Both authors have read and approved the final version submitted.

Mechano-sorptive is sometimes denoted as accelerated creep. It has been experimentally observed that the creep of paper accelerates if it is subjected to a cyclic moisture content. This is of large practical importance for the paper industry. The present manuscript describes a micromechanical model on the fibre network level that is able to capture the experimentally observed behaviour. In particular, the difference between mechano-sorptive creep in tension and compression is analysed. John Smith is a PhD-student who within a year will present his doctoral thesis. The present paper will be a part of that thesis.

Three potential independent reviewers who have excellent expertise in the this paper are:

Dr. Fernandez, Tennessee Tech, email1@university.com
Dr. Chen, University of Maine, email2@university.com
Dr. Singh, Colorado School of Mines, email3@university.com

I would very much appreciate if you would consider the manuscript for publication in the *International Journal of Science*.
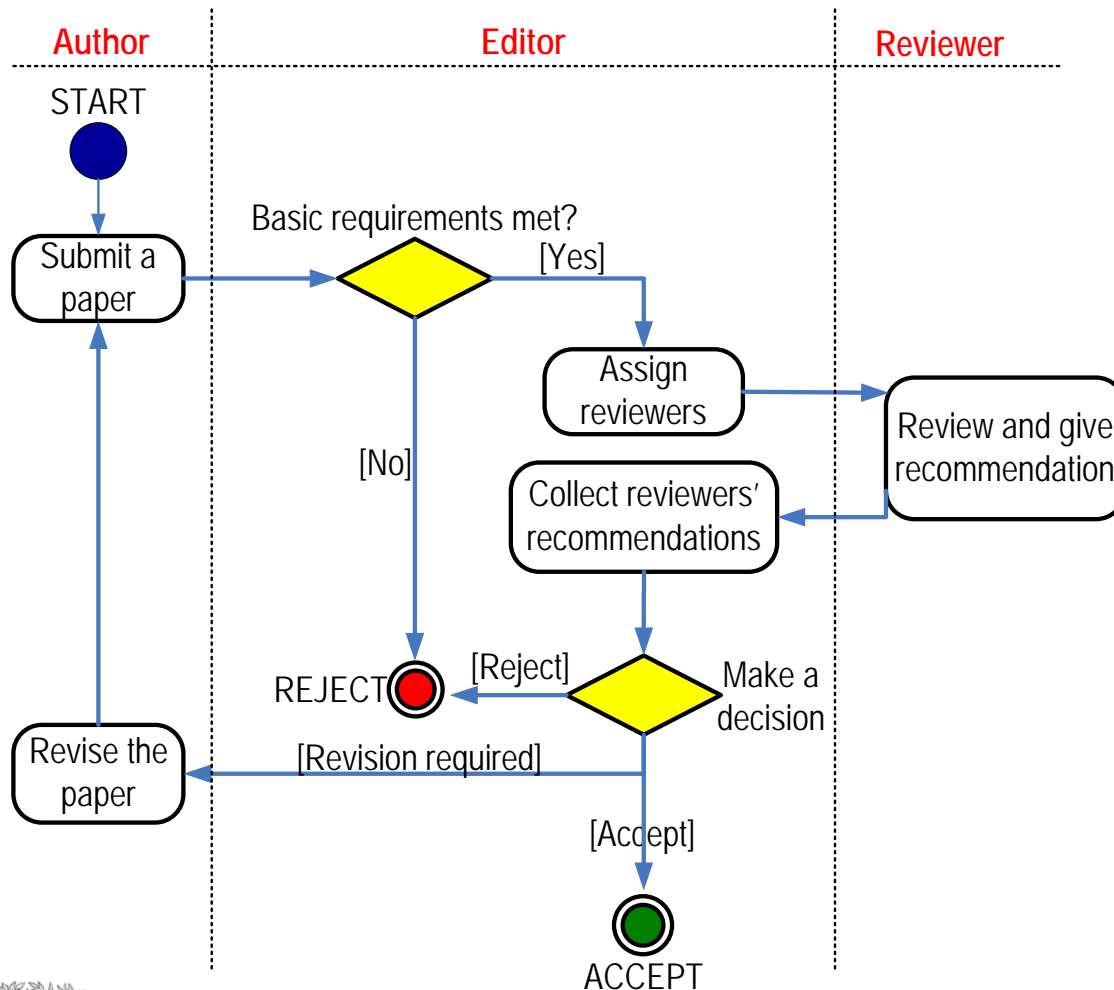
...ely yours,

A. Professor

Final approval from all authors

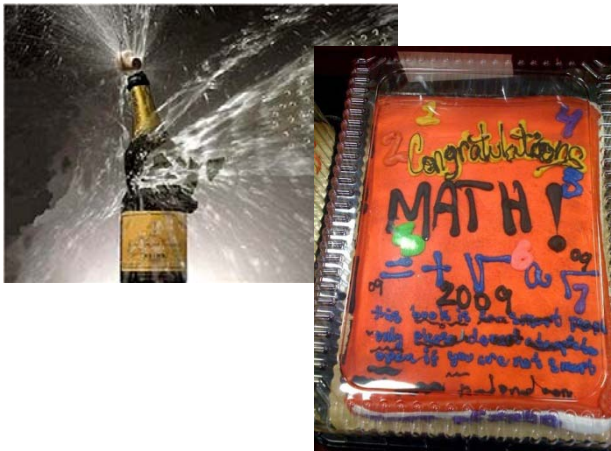**Explanation of importance of research**

Suggested reviewers

The Peer Review Process - Overview

# 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
  - The same reviewer may again review your manuscript!
  - Read the Guide for Authors of the new journal, again and again.
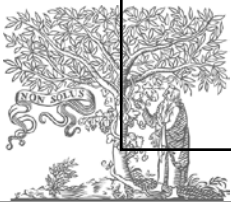
First Decision: "Major" or "Minor" Revision

- ## Minor revision
  - Basically, the manuscript is worth being 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 be worth being published
  - Significant deficiencies must be corrected before acceptance
  - Involves (significant) textual modifications and/or additional experiments

Building Insights. Breaking Boundaries.™

Manuscript Revision

- Cherish the chance of discussing your work directly with other scientists in your community.

- 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 then run the risk of avoidable rejection by not taking manuscript revision seriously?

Rejection: not the end of the world

- Everyone has papers rejected – do not take it personally.

- Try to understand why the paper was rejected.

- Note that you have received the benefit of the editors and reviewers' time; take their advice seriously!

- Re-evaluate your work and decide whether it is appropriate to submit the paper elsewhere.

- **If so, begin as if you are going to write a new article. Read the Guide for Authors of the new journal, again and again.**

Publish *AND* Perish! – if you break ethical rules

- International scientific ethics have 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 ethical standard* for science.

- Ethics problems with scientific articles are on the rise *globally*.
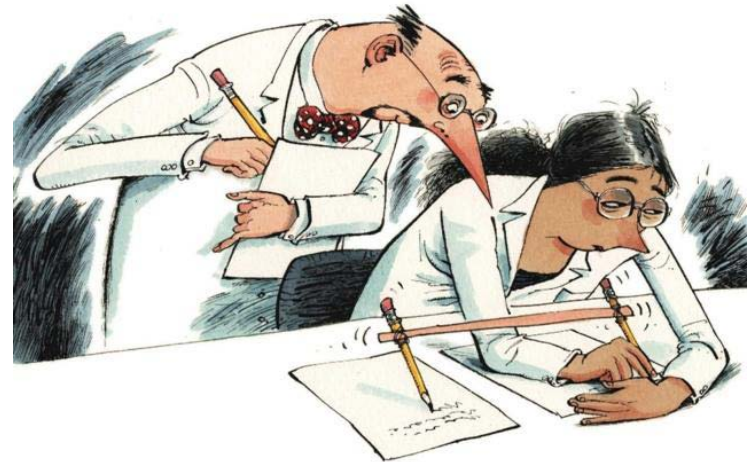
M. Errami & H. Garner
A tale of two citations
Nature 451 (2008): 397-399

Plagiarism Detection Tools

- Elsevier is participating in 2 plagiarism detection schemes:
  - Turnitin (aimed at universities)
  - Ithenticate (aimed at 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 now included, and the pre-1995 is being steadily added week-by-week

- Editors and reviewers
- Your 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."

A "pharma" author
December 2, 2008

BBC

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German minister loses doctorate after plagiarism row

Germany's defence minister has been stripped of his university doctorate after he was found to have copied large parts of his work from others.

Karl-Theodor zu Guttenberg, an aristocrat who lives in a Bavarian castle, admitted breaching standards but denied deliberately cheating.

Analysis revealed that more than half of his thesis had long sections lifted word-for-word from the work of others.

Mr Guttenberg failed to name sources for parts of his PhD thesis

So far the German Chancellor, Angela Merkel, has stood by the minister.

The University of Bayreuth decided that Mr Guttenberg had "violated scientific duties to a considerable extent".

It deplored the fact that he had lifted sections of text without attribution.

Last week Mr Guttenberg said he would temporarily give up his PhD title while the university investigated the charges of plagiarism. He admitted that he had made "serious mistakes".

His thesis - Constitution and Constitutional Treaty: Constitutional Developments in the US and EU - was completed in 2006 and published in 2009.

Chancellor Merkel insisted on Monday that she was standing by her defence minister, who was seen as something of a rising star in her conservative coalition.

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German minister denies plagiarism

doi:10.1016/j.sigpro.2005.07.019 ⑦ Cite or Link Using DOI

RETRACTED: Matching pursuit-based approach

Available online 24 August 2005.

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

Reason: This article is virtually identical to the previously published articl
algorithm for SNR improvement in ultrasonic NDT", *Independent Nond*
International, volume 38 (2005) 453 – 458 authored by N

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 contaminated with grain noise in highly scattering 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 processing method for improving SNR in ultrasonic NDT of highly scattering materials, such as steel and composites. Matching pursuit is used instead of BP to reduce the complexity. Despite 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, even when the input SNR (SNRin) is lower than 0dB (the level of echoes scattered by 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 signals in 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 adaptive signal models.

In each step of the iterative procedure, vector $g_i[n]$ which yields 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 mth iteration the residue is

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

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

The weight a_i^m associated to each atom $g_i[n] \in D$ at the mth 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 $g_{t(m)}[n]$ (and its weight $a_{t(m)}$) at the mth iteration are obtained as follows:

$$g_{t(m)}[n] = \arg\min_{g_i \in D} \|r^{m-1}[n]\|^2$$

$$= \arg\max_{g_i \in D} |a_i^m|^2 = \arg\max_{g_i \in D} |a_i^m|. \quad (3)$$

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:

$$\langle r^{m+1}[n], g_i[n]\rangle = \langle r^m[n], g_i[n]\rangle$$

$$- a_{t(m)}\langle g_{t(m)}[n], g_i[n]\rangle. \quad (4)$$

RETRACTED

Figure Manipulation

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

Brightness
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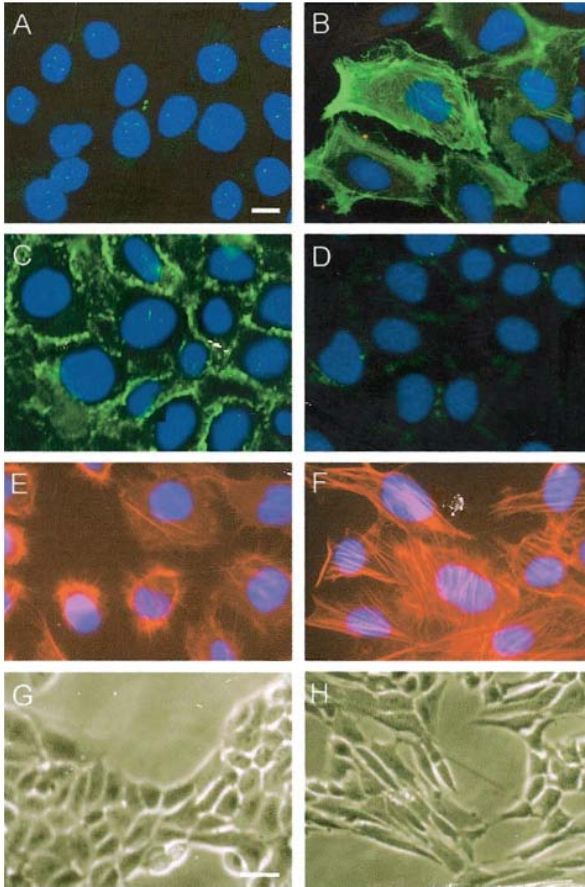Obscured
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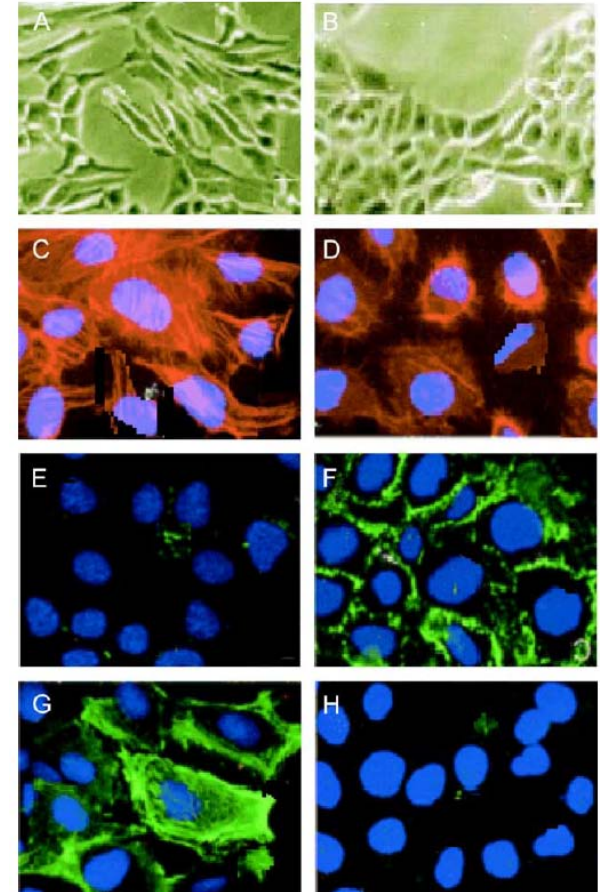
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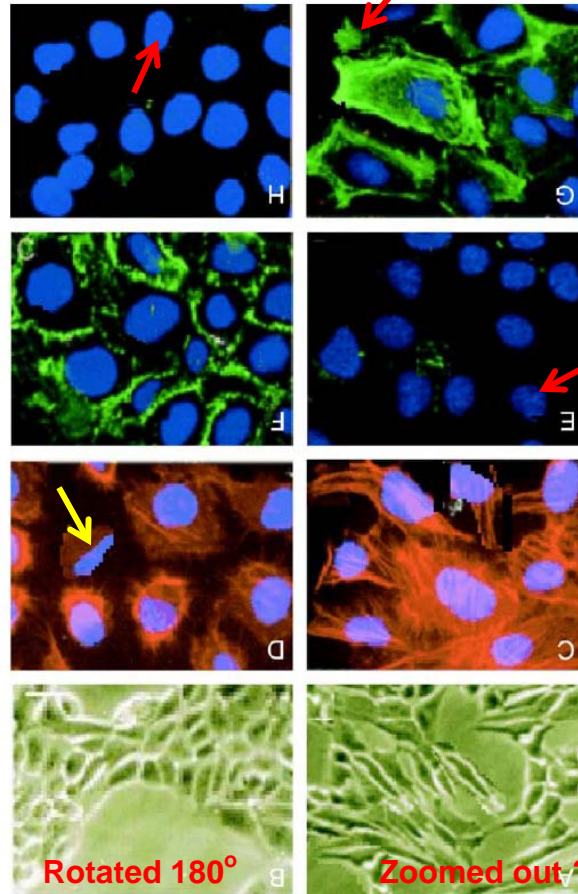
Data fabrication and falsification

Fabrication: Making up data or results, and recording or reporting them

"… the fabrication of research data … *hits at the heart of our responsibility to society*, the reputation of our institution, the trust between the public and the biomedical research community, and our personal credibility and that of our mentors, colleagues…"

"It can *waste the time of others*, trying to replicate false data or designing experiments based on false premises, and can lead to therapeutic errors. It can never be tolerated."

<div align="right">
Professor Richard Hawkes
Department of Cell Biology and Anatomy
University of Calgary
</div>

"The most dangerous of all falsehoods is a slightly distorted truth."

G.C.Lichtenberg (1742-1799)

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*

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Thank you!

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Rose Olthof
r.olthof@elsevier.com