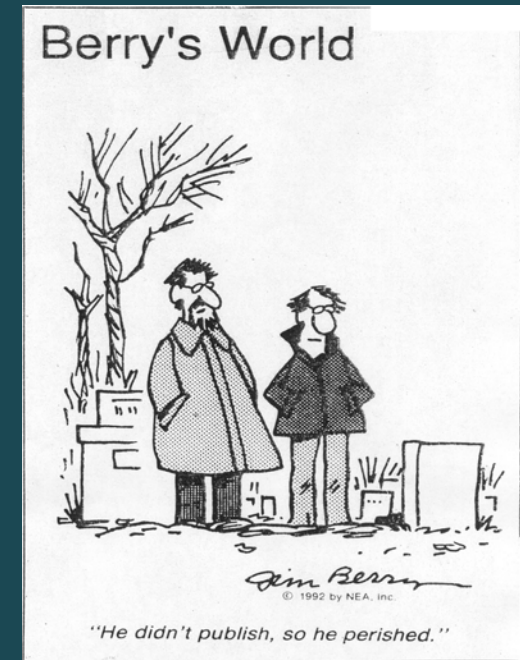


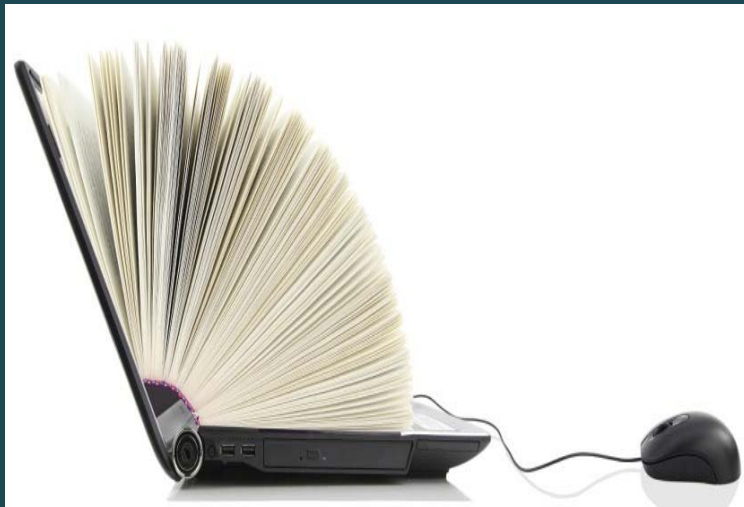
# Writing scientific articles, and trends in scientific publishing

What are editors, reviewers and publishers looking for?

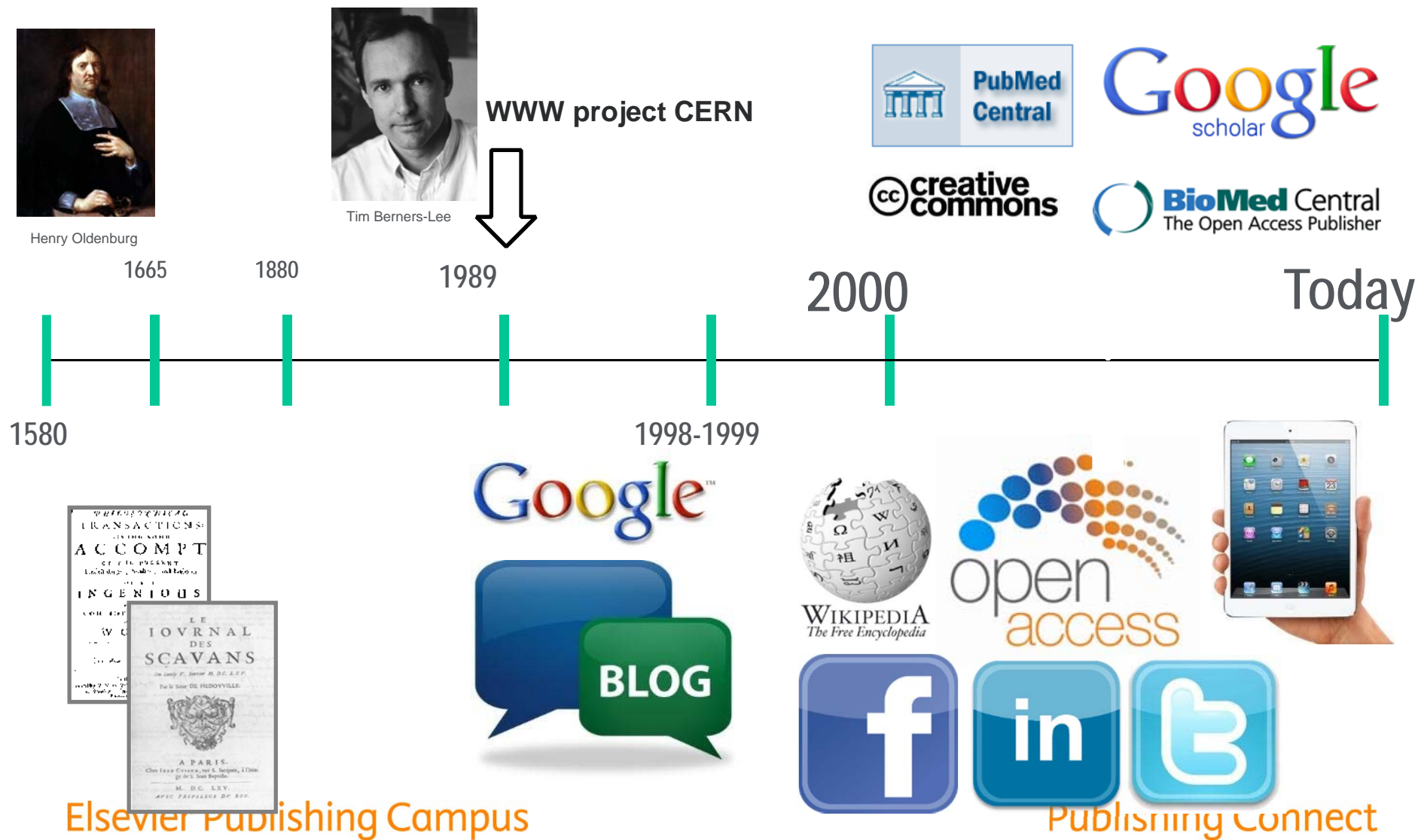


**Andrew Thompson and Dale Seaton**

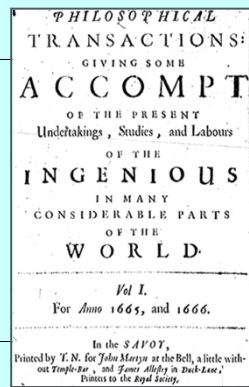
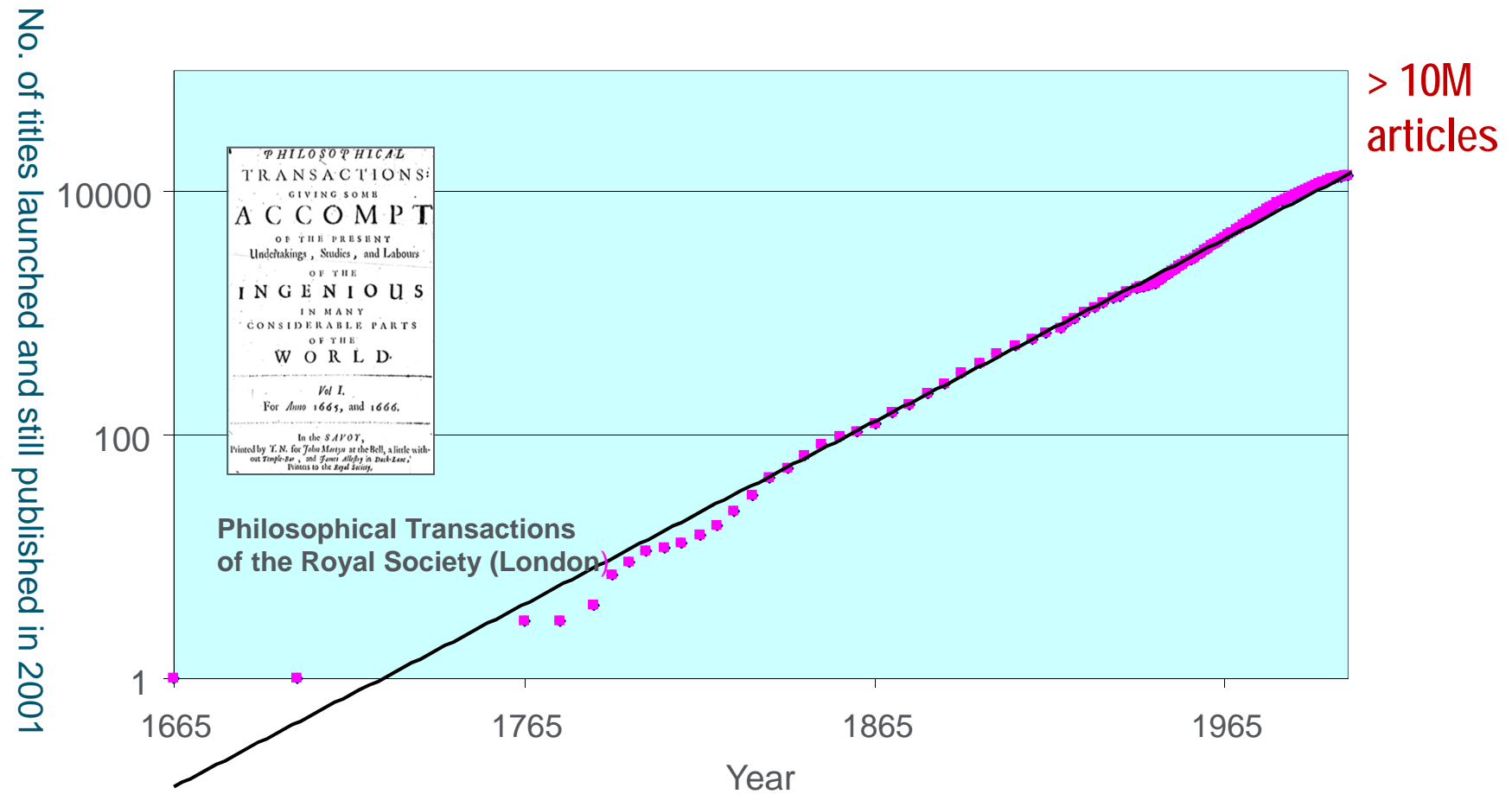
# Trends in publishing



# The Publishing Industry over Time



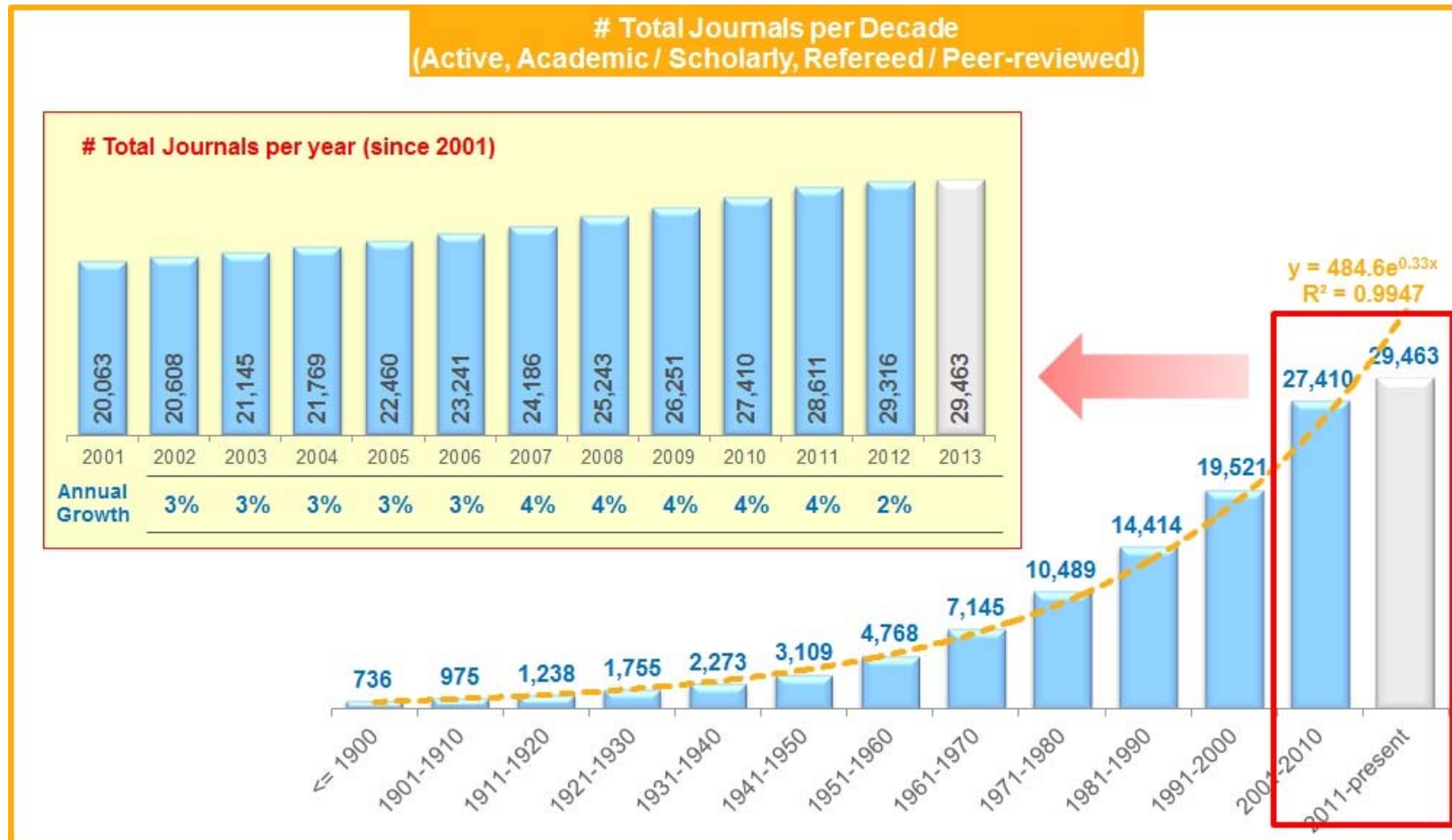
# Peer-reviewed journal growth 1665-2001



Philosophical Transactions  
of the Royal Society (London)

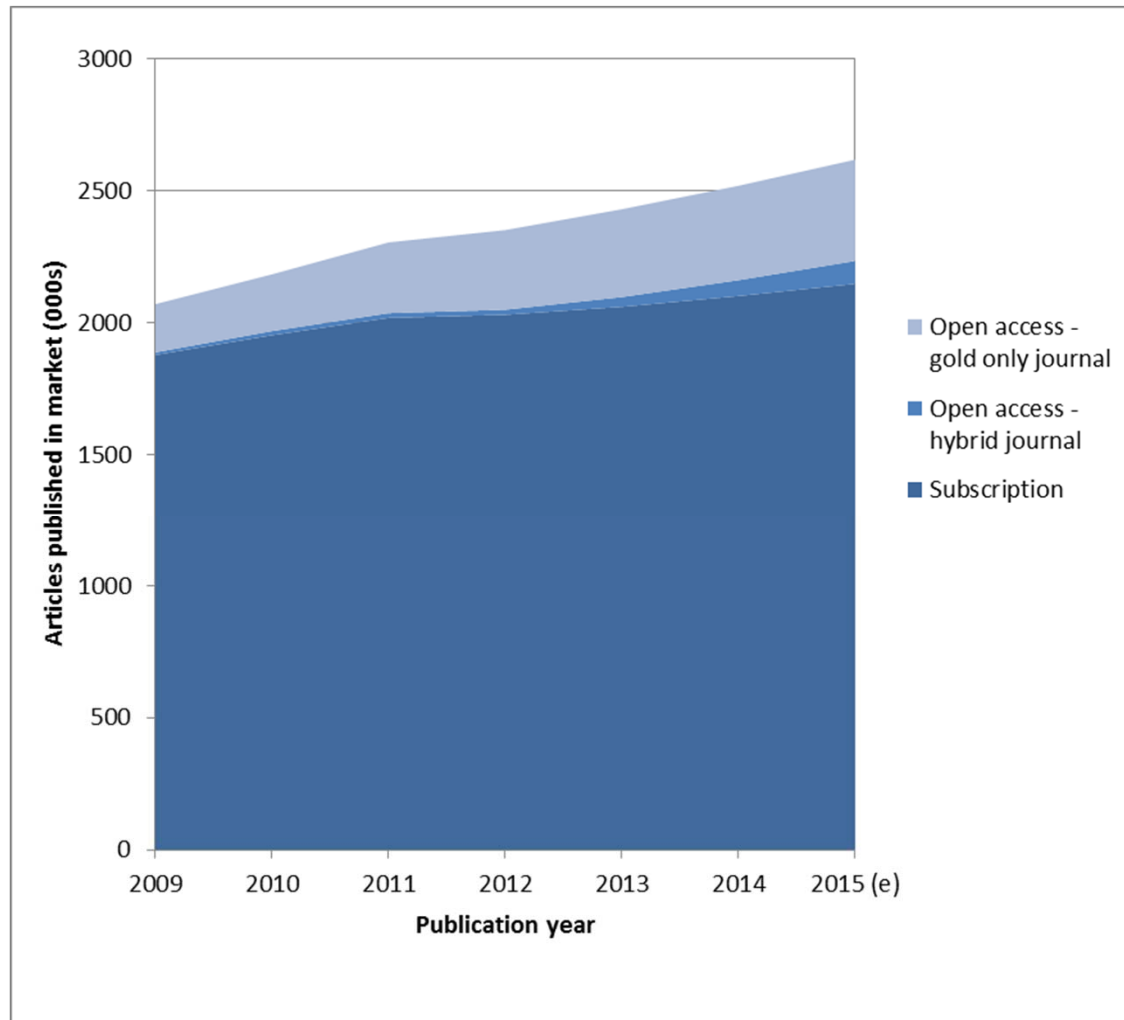
Source:  
M A Mabe The number and growth of journals,  
*Serials* 16(2). 191-7, 2003

# Peer-reviewed journal growth 1990-2013



# Journal article growth

In 2015 there were an estimated 2.1 million subscription and almost 0.5 million open access articles published worldwide.



## Subscription content

- 82% share of total articles in 2015

## Open access content

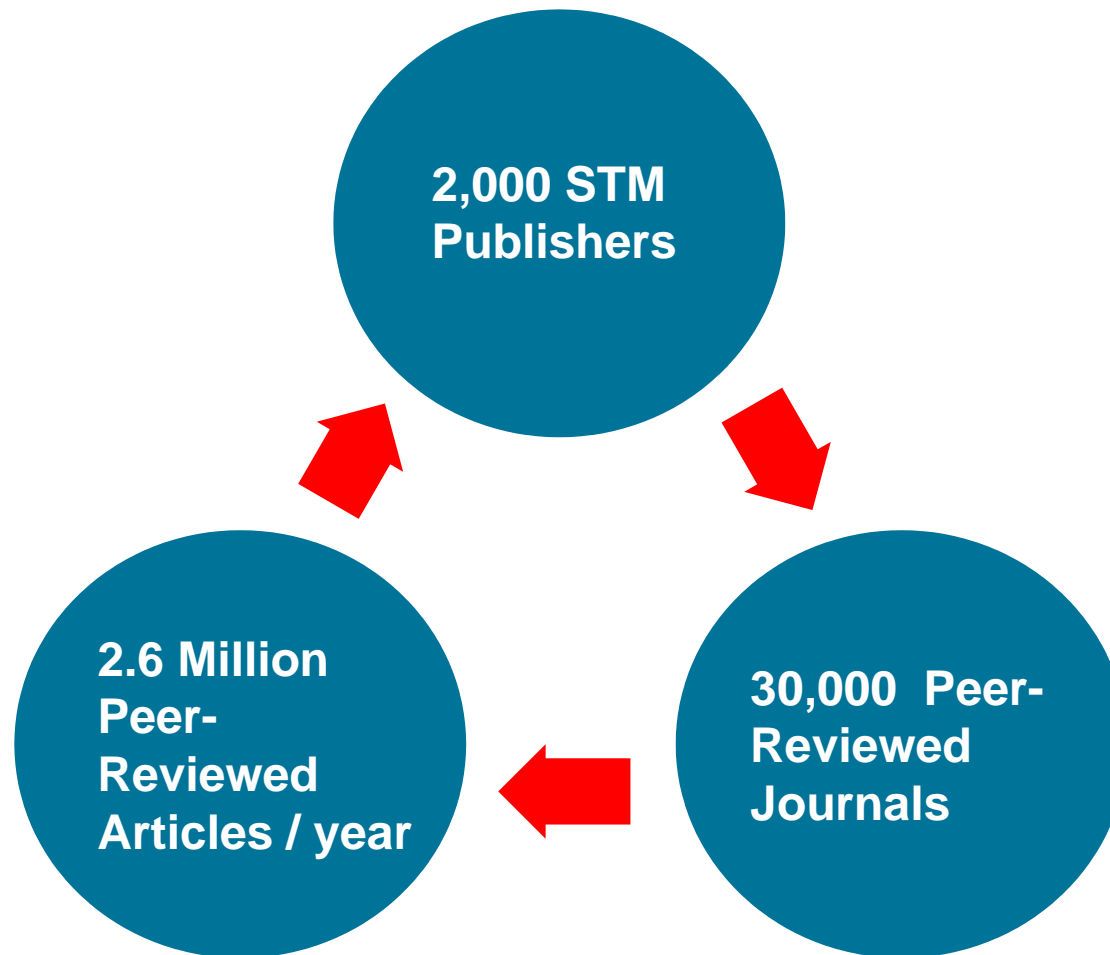
- Fully-paid-for open access articles is 13% share of total content in 2015
- All open access, including subsidized articles, is 18% share of total content.

## Impact on researchers

- The volume of research articles is continuing to grow
- For most researchers, it's a real challenge to keep up with the literature
- Researchers need to make sure their research doesn't fall through the cracks!

## Journal publishing today

- Scientific, technical and medical (STM) publishing



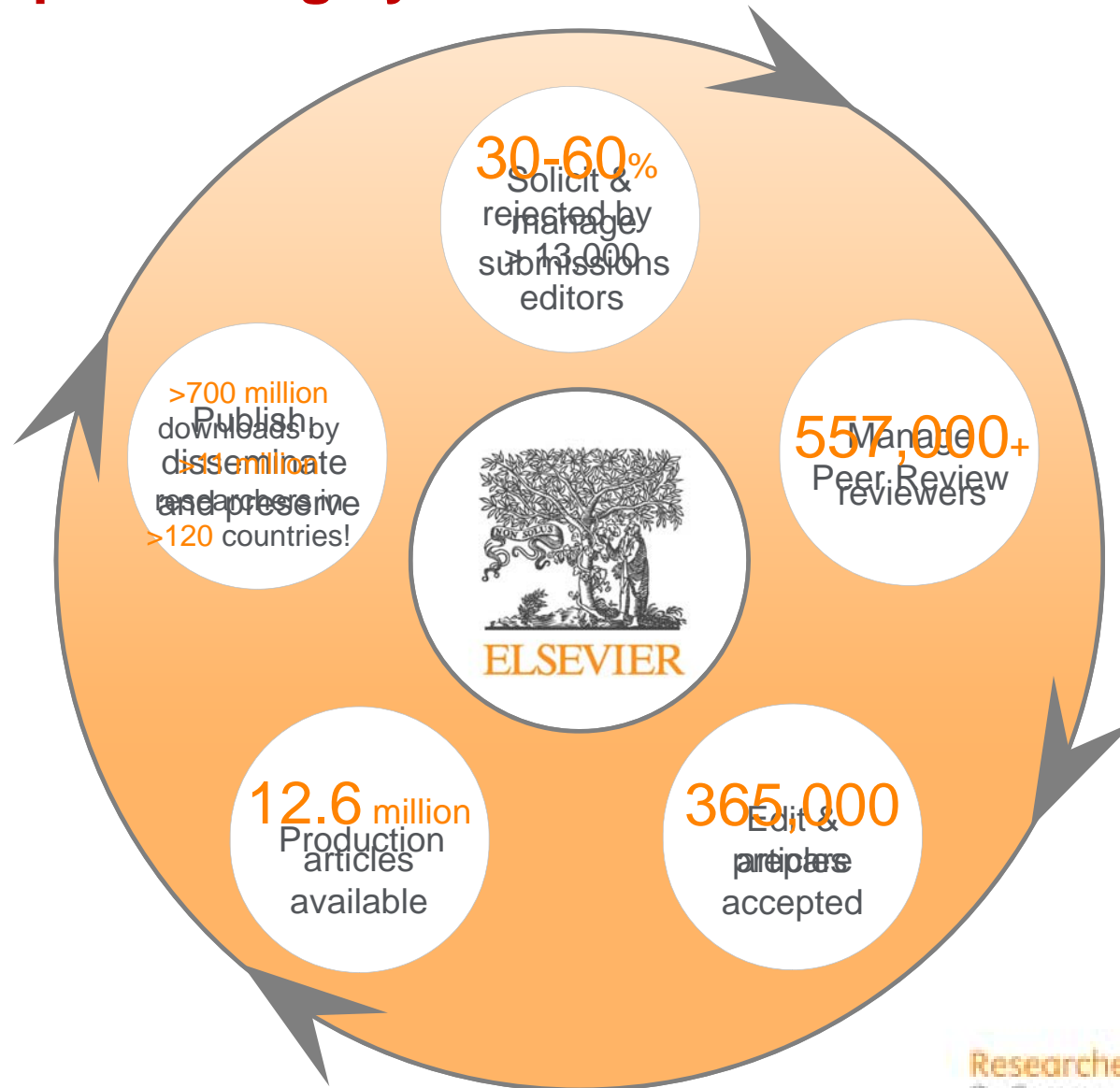
# What do publishers do

- Detect & support emerging fields
- Establish, cultivate and maintain journal reputation and quality





# The journal publishing cycle



## Role of scientific publications

- **Registration**
  - The timestamp to officially note who submitted scientific results first
- **Certification**
  - Perform peer-review to ensure the validity and integrity of submissions
- **Dissemination**
  - Provide a medium for discoveries and findings to be shared
- **Preservation**
  - Preserving the minutes and record of science for posterity
- **Use**
  - Easier to monitor in the digital environment

**Journal publishing has thrived for over 340 years but  
the fundamental role of Publishers remains unchanged**

# Choosing a journal



# Selecting the right journal – consider journal metrics

## The Impact Factor

- It indicates how many times the more recent papers in a journal are cited on average in a given year
- It is influenced by editorial policies of journals and turnover of research

The impact factor\* can give you a general guidance, but it should NOT be the sole reason to choose a journal.

## Other bibliometric indicators

- SCImago Journal Rank (SJR), Source Normalized Impact per Paper (SNIP), Field Weighted Citation Impact (FWCI), **CiteScore**, etc.

## Coverage in Abstracting & Indexing databases

- Scopus, Medline, ChemAbstracts, INSPEC, etc.

**\*Thompson Reuters recently sold the impact factor section of their company to Clarivate**

# Do not just descend the Impact Factor ladder



Top journals, *Nature, Science, Lancet, Cell...*



Field-specific top journals



Other field-specific journals



National journals

## **It is not (only) the Impact Factor, it is (mainly) the right audience!**

Consult the Journal homepage to learn:

- Aims and scope
- Accepted types of articles
- Readership
- Current hot topics

Go through the abstracts of recent publications

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**

## What should I look for in a journal?

- A journal that is read by colleagues that work in the same field. Is it reaching your community?
- A journal that has the highest impact for that particular field (not necessarily the highest IF!)
- A journal that has fast turnaround times (see journal metrics)
- A journal that is easy to find on the web

## Where to publish?

- Ask help from your supervisor or colleagues
- Your supervisor (who is sometimes the corresponding author) has at least co-responsibility for your work. You are encouraged to chase your supervisor if necessary.
- Your colleagues may already have experience of the journal (or the Editor!)



## Tips and tools for... Selecting the right journal

- Aim to reach the intended audience for your work
- Choose only one journal, as simultaneous submissions **are prohibited**
- Supervisor and colleagues can provide good suggestions
- Shortlist a handful of candidate journals, and investigate them:
  - Aims and scope
  - Scan recent tables of contents
  - Readership
  - Current hot topics


Which journals do you cite and read?

The screenshot shows the Elsevier website interface for the International Journal for Parasitology: Parasites and Wildlife. At the top, there is the Elsevier logo and a search bar. The breadcrumb trail reads 'Home > Journals > International Journal for Parasitology: Parasites and Wildlife'. The journal cover image is displayed on the left, with the ISSN: 2213-2244 listed below it. On the right, the journal title is prominently displayed, followed by the sponsor: 'Sponsored by the Australian Society for Parasitology'. Below this, there are links for 'Open Access', 'Editors-in-Chief: Susan Kutz, Andrew Thompson', and 'View Editorial Board'. A descriptive paragraph states: 'The International Journal for Parasitology: Parasites and Wildlife (IJP-PAW) publishes the results of original research on parasites of all wildlife, invertebrate and vertebrate. This includes free-ranging, wild populations, as well as captive wildlife, semi-domesticated species (e.g. reindeer) and farmed...'. A 'Read more' link is provided. At the bottom of the page, there is a 'Researcher Academy' banner with the text 'You're already an expert. We'll teach you the rest.' and a 'Start learning' button. A 'Most Downloaded Articles' section is partially visible at the very bottom.

# Consult the Journal Homepage

**ELSEVIER** Type here to search on Elsevier.com  [Advanced search](#) Follow us: [f](#) [in](#) [t](#)

[Journals & books](#) [Solutions](#) [Authors, editors & reviewers](#) [About Elsevier](#) [Community](#)



Open Access

## International Journal for Parasitology: Parasites and Wildlife

**Sponsored by the Australian Society for Parasitology**

The *International Journal for Parasitology: Parasites and Wildlife (IJP-PAW)* publishes the results of original research on parasites of all wildlife, invertebrate and vertebrate. This includes free-ranging...

[View full aims and scope](#)

**Editors in Chief:** Lydden Polley, Andrew Thompson  
[View full editorial board](#)

Guide for Authors ▼

Submit Your Paper ▼

View Articles

### Journal Metrics

SCImago Journal Rank (SJR): 0.111

Imprint: ELSEVIER

ISSN: 2213-2244

### Stay up-to-date

Register your interests and receive email alerts tailored to your needs

[Click here to sign up](#)

**Recent Articles**
ScienceDirect
*i*

**Restricted evaluation of *Trichodectes canis* (Phthiraptera: Trichodectidae) detection methods in Alaska gray wolves**  
Theresa M. Woldstad | Kimberly N. Dullen | ...

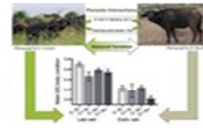
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**A new coccidian, *Isospora rhea* sp. nov. (Apicomplexa, Eimeriidae), from *Rhea americana* (Aves, Rheidae) from South America**  
Samira S.M. Gallo | Nicole B. Ederli | ...

---

**Gastric nematode diversity between estuarine and inland freshwater populations of the American alligator (*Alligator mississippiensis*, daudin 1802), and the prediction of intermediate hosts**

### Editors' Choice



**Nematode–coccidia parasite co-infections in African buffalo: Epidemiology and associations with host condition and pregnancy**  
Erin E. Gorsich, Vanessa O. Ezenwa, Anna E. Jolles

---

***Toxoplasma gondii* exposure in arctic-nesting geese: A multi-state occupancy framework and comparison of serological assays**  
Stacey A. Elmore, Kathryn P. Huyvaert, Larissa L. Bailey, Jared Milhous, Ray T. Alisaukas, Alvin A. Gajadhar, Emily J. Jenkins

## Selecting the right journal - Beware of predatory journals!



Think - Check - Submit

Choose the right journal for your research

Worried about choosing the right journal to publish your article? Use the checklist at [Think - Check - Submit](http://thinkchecksubmit.org/) to help you determine if a particular journal is right for you!

<http://thinkchecksubmit.org/>

<https://predatoryjournals.com/about/>  
lists over 1250 predatory publishers!  
There are over 10,000 predatory journals.

- **Open Access journals should be on:** Directory of Open Access Journals (DOAJ): <https://doaj.org/>

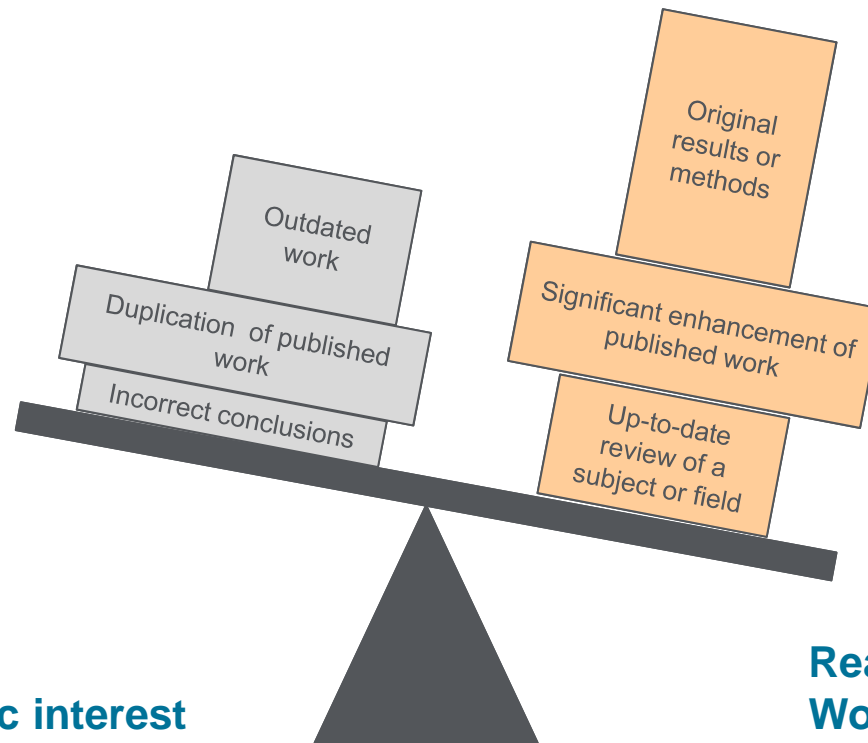
# Ready to Write

## First a simple truth

- No matter how fascinating your experimental results or how intriguing your clinical observations, your work must be published if it's going to impact science and advance the field
- Even if your discovery is brilliant, bad writing can render your findings unpublishable or delay publication until it is extensively revised
- “It's not science until it's published!”

# Tips and tools for... Planning and preparing your article

Are you ready to publish?

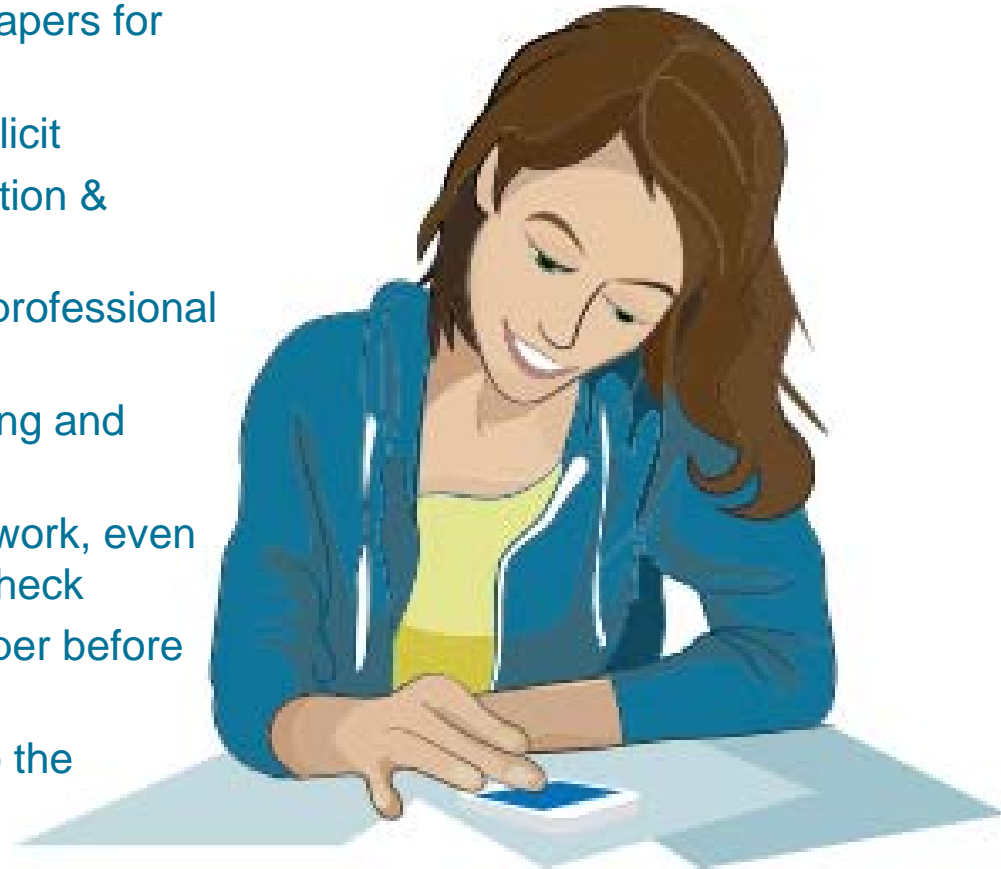


**Not ready**  
**Work has no scientific interest**

**Ready**  
**Work advances the field**

## Tips and tools for... Preparing your article

- Check guide for authors and other papers for style and structure
- Title - make subject and method explicit
- Spend time on abstract and introduction & conclusions
- Use easy to understand charts and professional illustrations
- Use clear language and check spelling and grammar
- Do not cut and paste from previous work, even a thesis. If possible, do a similarity check
- Have another person check your paper before you submit it
- Make it clear what the paper adds to the literature and why it is important



# Do publishers correct language?

- **No.** It is the **author's responsibility** to make sure their paper is in its best possible form when submitted for publication – Reviewers and Editors don't do it!
- Publishers often provide resources for authors.
  - § Some publishers may perform technical screening prior to peer review.
  - § <http://webshop.elsevier.com/languageservices>



## NEW! Translation services

Lost in English translation? Write in your own language and get expert support. Our scientific professionals translate from eight different languages to English guaranteed **within 12 days**.

MORE ►



## English language editing

Only 5 business days to have your manuscript edited in correct scientific English. Our history of scientific publishing ensures that your English is free of mistakes.

MORE ►





# A Good Manuscript....

- Contains a scientific message that is novel, clear, useful, relevant and exciting.
- Conveys the authors' thoughts in a logical manner such that the reader arrives at the same conclusions as the author.
- Makes the editor feel like (s)he has learnt something useful!
- Is well-organized and focused, and best of all, **NOT TOO LONG.**



# Manuscript Language – Overview



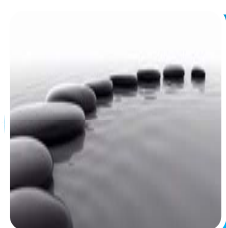
Accurate



Concise



Clear



Objective

# Sentence Structure



Write direct and short sentences



One piece of information per sentence



Avoid multiple statements in one sentence

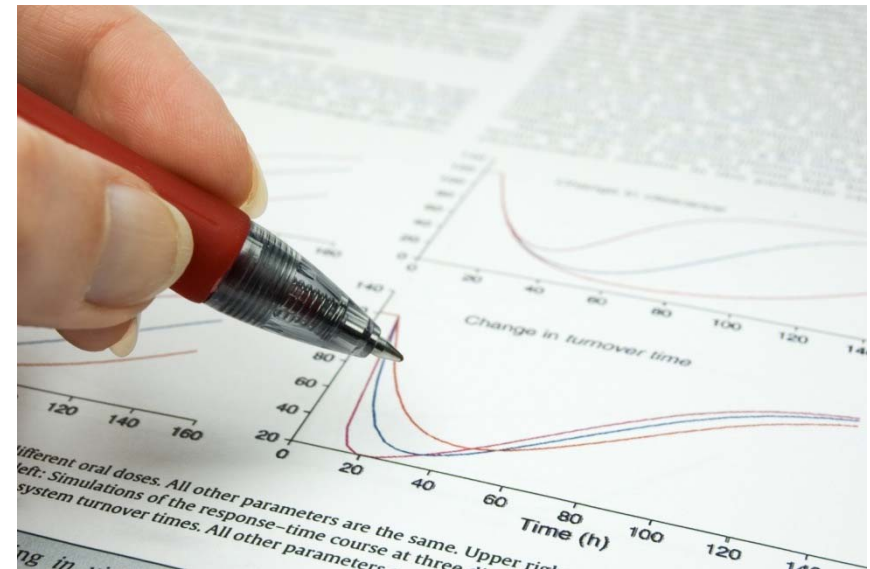
Tip:

Read your manuscript out loud when proofreading.  
You will pick up on more errors and run-on sentences.

# Tenses

*Present tense:*  
for known facts  
& hypotheses

*Past tense:*  
for experiments  
conducted & your  
results



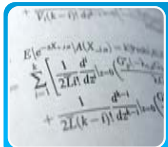
# Grammar



Use active voice to shorten sentences



Avoid abbreviations



Minimize use of adverbs



Eliminate redundant phrases



Double-check unfamiliar words or phrases

## Questions

What are some characteristics of the best manuscript writing you have seen?

What is it that distinguishes a very good manuscript from a bad one?

## What makes up a strong manuscript

Has a clear, useful, and exciting message

Presented and constructed in a logical manner

Reviewers and editors can *easily* grasp the significance



**Make it easy on the editor and reviewers to understand your story**

# Abstract

The abstract should just be one paragraph :

What has been done & what are the main findings.

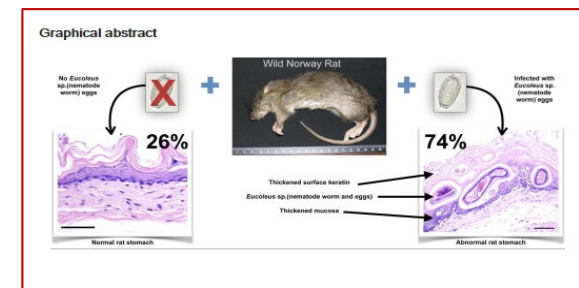
The abstract is the **advertisement** for your article and is freely available in PubMed, Medline, Embase, SciVerse Scopus, etc.

Most important section of the article — It will be read by the most people

It should include important data (sample size, statistics) and results

It is often best to write abstract last

Some journals now also ask for a graphical abstract.





# Introduction

Introduction is especially important!  
A high proportion of “lack of novelty” rejections are made after reading abstract, introduction and conclusions.

- You are telling a story. The Introduction sets the scene.
- What was the purpose of this work?
- State the reason you did the study as clearly as possible.
- Do not attempt to summarize the whole field (it is not possible!)
- Quote what is necessary for background and give credit to previous works  
**[Reviewer could have written a seminal article in the past!].**

# Introduction (Continued)

- Give a clear **motivation** for the work. Explain why before explaining how.
- Explain what is **novel** compared to what is already available in the literature
- High level description of your approach. Why is it **important**? Why is it **difficult**?
- What are the **alternatives**? Why is yours **different** or **better**?
- What are the gaps and how are you going to fill them? At the end of the introduction the reader knows the problem and maybe the solution/approach you propose

# Methods

***Describe how the problem was studied***

- Often the easiest place to start writing the papers
- Describe how the research was done
- Methods or procedures used, study population and demographics (if needed)
- Give enough detail for critique and replication of procedures and confirmation of results
- When using methods that have been published before, reference the publication without repeating the description – *but merely citing a previous article may not be sufficient*
- Identify the equipment and materials used
- Describe as objectively as possible, in simple terms
- Manufacturer name and location should be cited with brand name product or source of cells
- Describe the statistical methods used
- Be specific when citing computer programs
- Must state receipt of informed consent for studies using human subjects or materials
- Ethics permit details

# Results

- Describe your findings in a logical sequence
- Should parallel your Methods section
- Provide some structure with subheadings – if necessary
- Don't repeat what you've already stated
- Emphasis is on the observations of your research -- NOT the implications
- Check *and recheck* your data for accuracy and consistency — make sure the numbers add up!
- Results of the statistical analyses
- Figures and tables
- Can often be one of the shortest sections of your paper

# Results: figures and tables

- Illustrations are critical because Figures and tables are the most efficient way to present results. They should be used for ESSENTIAL data only
- Don't repeat what is in the text – should be complementary
- Captions and legends should be self-explanatory; figures should be able to stand alone. *What is the take home message?*
- Maximize space; make sure final versions of figures can be easily read
- Use colour – **take advantage since on-line**
- Use consistent formatting between figures
  - Plots: labels, scale and symbols
  - Micrographs: scale bar, point out key features

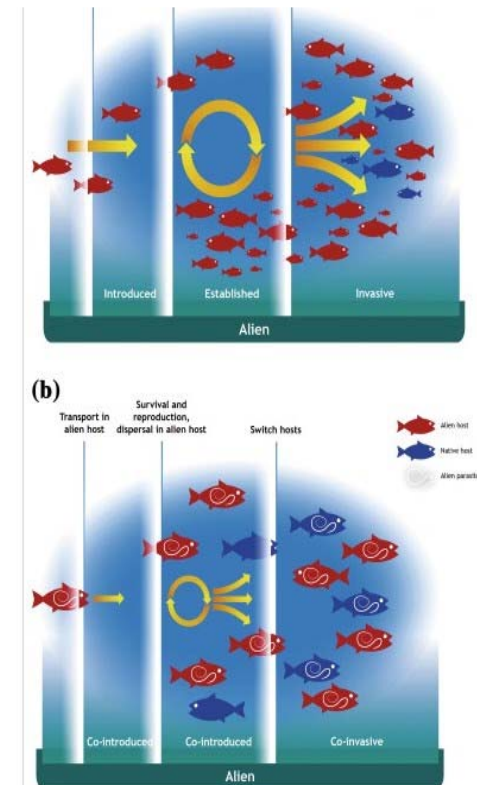
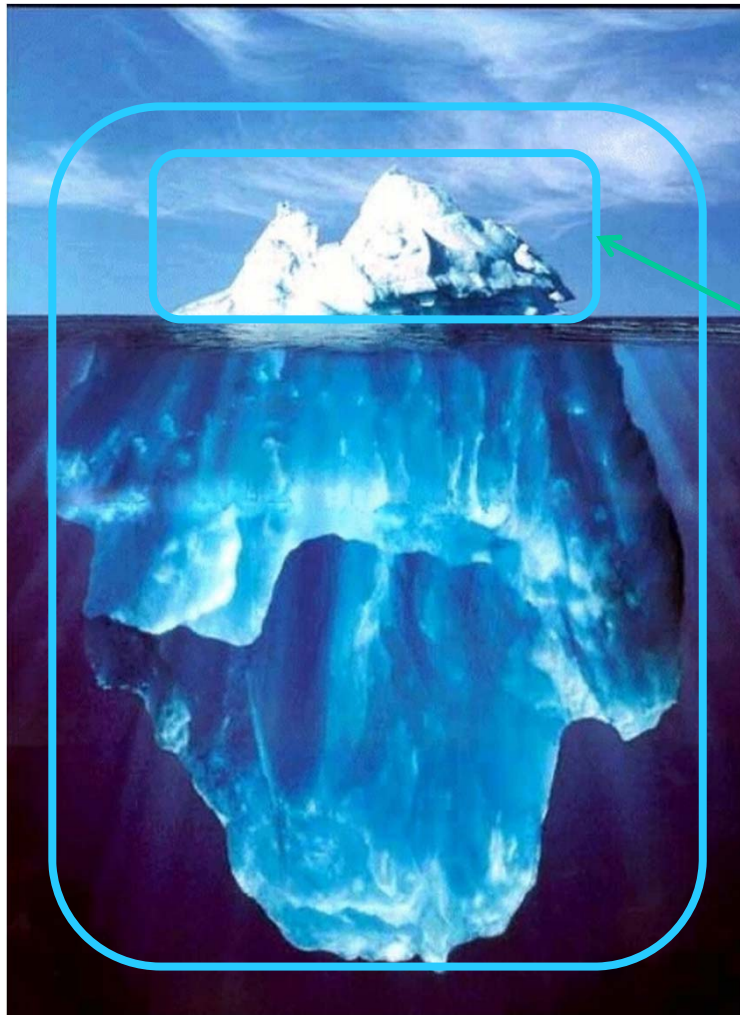


Fig. 1.

# Results



***Do not try to fit everything in!***

**But this is what should end up in the paper**

**This may be your total work..**

# Discussion

**The Discussion is where you interpret what your results mean. Provide *critical appraisal*. This is the most important section of the article.**

- Does not require complete review of the literature but should place the study in context for the reader – *but don't repeat what is in the Introduction.*
- Why are your findings new and different?
- How are they relevant? Can you identify a mechanism to explain your results or hypothesis?

Include:

- Interpretation of results taking into account any sources of bias or imprecision
- Context of results with current evidence and in relation to the purpose of your study.

## Discussion continued

**It is where you have the chance to sell your data!  
Many papers are rejected because the discussion is too weak - *You don't want the reader to think .. "Ok so what?"***

Be careful ***not to use*** the following:

- Statements that go beyond what the results can support
- Unspecific expressions such as “higher temperature” or “at a lower rate”; do use **quantitative descriptions** – true also for the Results section
- Sudden introductions of new terms not mentioned previously in your paper
- Speculations on possible interpretations are allowed. But these should be rooted in fact, rather than imagination.



# Conclusions

## How the work advances the field from the present state of knowledge

- Not the same as a summary!
- Give conclusions that are supported by your results
- Try to end in a positive tone
- Do not overreach:  
Statements such as “*this method can potentially be used...*” do not belong to the conclusions (and often irritate referees).

# References

**Cite the main scientific publications on which your work is based**

Do not use too many references - *but don't be lazy and only cite most recent reviews*

Always ensure you have fully absorbed material you are referencing

Avoid excessive Self-Citation

Avoid excessive citations of publications from the same region

Conform strictly to the style given in the guide for authors



# Acknowledgments

**Ensures that those who helped in the research are recognized**



Advisors and Undergrad. Support



Financial Supporters and Funding Bodies



Proofreaders and graphic artists



Suppliers who may have donated materials

# 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, or acquisition of data, or analysis and interpretation of data;
  - *draft* the article or *revise* it critically for important intellectual content; and
  - *give their approval* of the final full version to be published.
  - **ALL 3 conditions must be fulfilled to be a credited author!**

**As editors and publishers one of the most common cases that we have to deal with are disputes over authorship, often between supervisors and disgruntled students. These are often impossible for us to resolve.**

***Dear Editor...I will be contacting the University Ombudsman and someone will be in contact with you in the near future...***

# Cover Letter

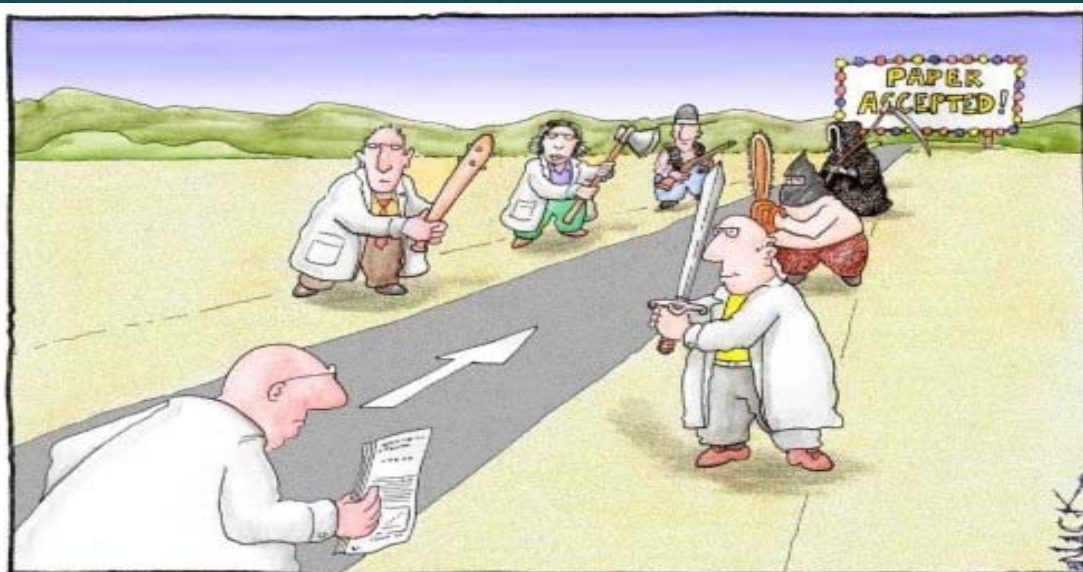
***Very important:***

***Your chance to speak directly to the Editor***

- Often overlooked by authors and filled cursorily (a big mistake!).
- You have spent months working on your paper.  
Do not hurry up now!
- Explain the main findings and motivation
- Highlight the novelty and significance of results
- State final approval of all co-authors
- State prior reviews, revisions, etc.
- Note special requirements (suggest not to contact a particular referee, for example)
- Suggest referees: experts, *not* collaborators
- ***State any conflicts of interest***

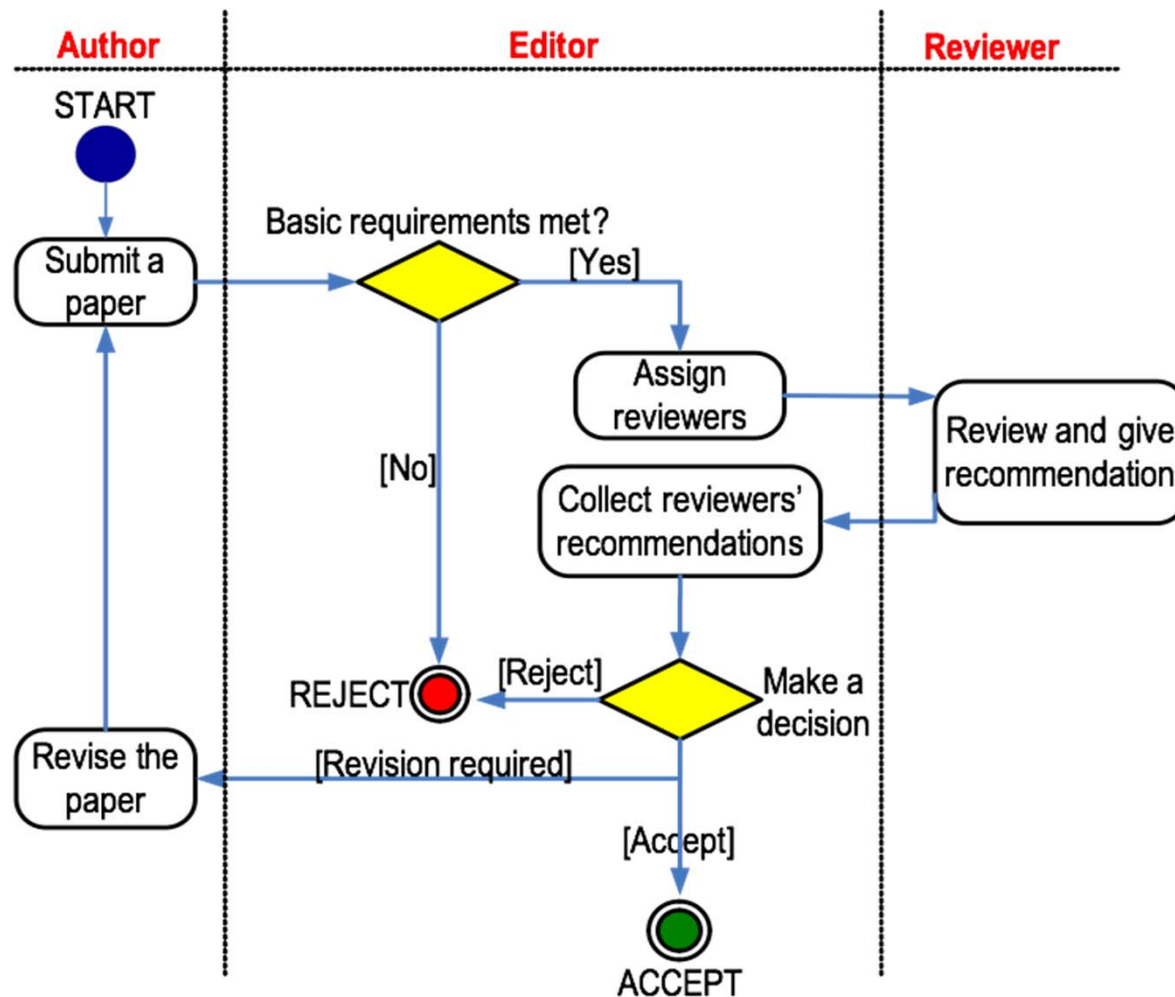


# The peer review process



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

# Peer review



## The 4 possible outcomes

- Accept as it is
- Accept with minor or moderate revision, usually not back to referees
- Major revision, revised manuscript usually goes back to referees
- Reject





## Peer review process - role and tasks of reviewer

- The scientific publishing enterprise depends largely on the quality and integrity of reviewers
- Reviewers are at the heart of the scientific publishing process
- Reviewers should:
  - Provide fair and unbiased comments on the quality and value of an article
  - Write reports in a collegial and constructive manner with evidence-based comments
  - Treat all manuscripts in the same manner and make a clear recommendation

# First Decision: “Accepted” or “Rejected”

## Accepted

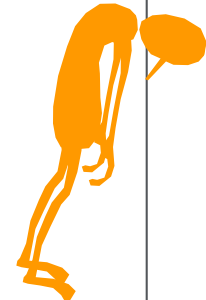
- Very rare, but it happens



- 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**
  - Straight out rejection without peer review
  - 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.



## Why are manuscripts rejected?

- Poor research quality
- Poor manuscript development
- Poor English language and grammar
- Not the right journal
- Journal has recently published similar work
- Nothing new in the work presented



## Managing a rejection

- A significant percentage of papers are rejected by the Editor on submission without going out to review.
- Don't take it personally! It does not necessarily mean the paper is not a good one.
- Work with reviewers' feedback to strengthen the paper.
- Find another journal to submit to



# First Decision: “Major” or “Minor” Revisions

## 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

## Minor revision

- Basically, the manuscript is worthy 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!

# Manuscript revision: A great learning opportunity!

- Prepare a **detailed** letter of response
  - Copy-paste reviewer comments and address one by one\*
- State **specifically** what changes you have made to the manuscript.
  - Give page and line number.
- Provide a **scientific response** to the comment you accept; or a convincing, **solid and polite rebuttal** to the point you think the reviewer is wrong.
- If numerous changes revise the **whole** manuscript
  - not just the parts the reviewers point out
- Minor revision **does NOT guarantee** acceptance after revision.
  - Do not count on acceptance, but address all comments carefully

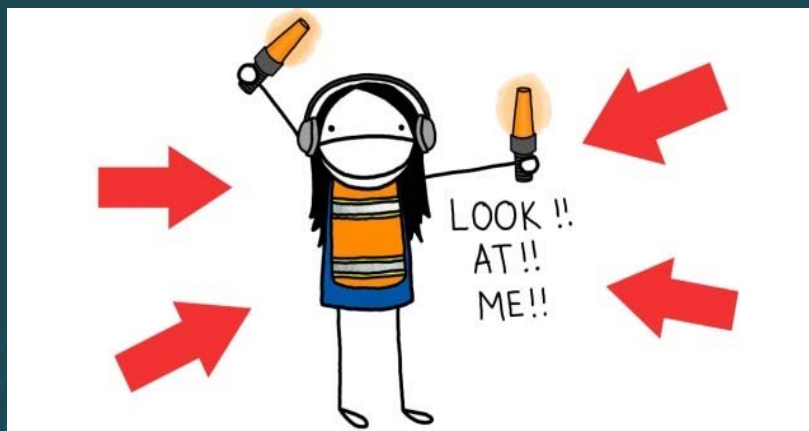
**\* This makes it much easier for the Editor**

## What leads to acceptance?

- Attention to details
- Check and double check your work
- Consider the reviewers' comments
- English must be as good as possible
- Presentation is important
- Take your time with revision
- Acknowledge those who have helped you
- New, original and previously unpublished
- Critically evaluate your own manuscript
- Ethical rules must be obeyed

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

# Promoting and monitoring your article performance post acceptance





# Promoting your article

## 1. Conferences

- Prepare to network
- Also connect online
- Online poster

## 2. Media relations

- Research statement
- Your institution's communication's channels
- Contact your editor or you can send an email to: [researchcomm@elsevier.com](mailto:researchcomm@elsevier.com)



## Promoting your article

### 3. Social Media

#### LinkedIn

- Share links to your articles, also in relevant groups
- Add images
- Add videos, AudioSlides

#### Twitter

- Follow other researchers
- Post regularly, respond promptly
- Retweet

#### Facebook

- Share images, videos, AudioSlides
- Link to your articles
- Discuss and ask for feedback

Every day, scholarly articles receive 12,000 new mentions across social media, news and blogs: that's one mention every seven seconds!

# Monitoring the performance of your article Scopus

The screenshot shows the Scopus interface for an article. The article title is "The spread of obesity in a large social network over 32 years" by Christakis, N.A. and Fowler, J.H. The article is from the New England Journal of Medicine, Volume 357, Issue 4, 26 July 2007, Pages 370-379. The article has 2090 Citations in Scopus (99th Percentile) and a Field-Weighted Citation Impact of 107.07. The Metrics section is circled in red. Below the article title, there is an abstract and indexed keywords. The abstract discusses the prevalence of obesity and the results of a quantitative analysis of a social network. The indexed keywords include adult, aged, article, body mass, epidemic, female, friend, geographic distribution, human, major clinical study, male, obesity, prevalence, priority journal, quantitative analysis, risk factor, sibling, smoking cessation, social aspect, spouse, weight gain. The MeSH keywords include Adult, Attitude, Causality, Female, Humans, Logistic Models, Longitudinal Studies, Male, Obesity, Social Behavior, Social Support, and Sociology, Medical. The Metrics section shows 2090 Citations in Scopus (99th Percentile) and a Field-Weighted Citation Impact of 107.07. Below this, there is a PlumX Metrics section with a dropdown arrow. The PlumX Metrics section includes Usage, Captures, Mentions, Social Media and Citations beyond Scopus. The Cited by 2090 documents section lists several articles, including "Comparing methods of targeting obesity interventions in populations: An agent-based simulation" by Beheshti, R., Jalalpour, M., Glass, T.A. (2017) SSM - Population Health Social Networks Across Common Cancer Types: The Evidence, Gaps, and Areas of Potential Impact, and "Adolescent and Young Adult Use of Social Media for Health and Its Implications" by Hausmann, J.S., Touloumtzis, C., White, M.T. (2017) Journal of Adolescent Health. There are also buttons for "Set citation alert" and "Set citation feed".

# Monitoring the performance of your article - Scopus

The spread of obesity in a large social network over 32 years [Back to article](#)  
(2007) New England Journal of Medicine, 357(4), pp. 370-379

Scopus Metrics

About Snowball Metrics

Citation Count

## 2162

Cited by in Scopus

Field-Weighted Citation Impact

## 106.99

Citation Benchmarking

99th percentile   
 Compared to Medicine articles of same age and document type.

**Cited by**

**2162 Citations**

Date range: 2013 to 2017

Exclude self citations

Exclude citations from books

[Edit the data for this graph.](#) [Update](#)

**Benchmarking**

Measures of activity relative to specific research domains, based on cited by in Scopus  
 Compared to Medicine articles of the same age and document type

All Citations  99 TH PERCENTILE

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**PlumX Metrics**  
see details

**Usage**

- Bitly - Clicks: **158**
- Bitly - Clicks: **53**
- Bitly - Clicks: **21**
- EBSCO - Abstract Views: **3424**
- EBSCO - HTML Views: **1184**
- EBSCO - Link-outs: **420**
- EBSCO - PDF Views: **1**

**Captures**

- EBSCO - Exports-Saves: **531**
- Mendeley - Readers: **2**

**Mentions**

- Blogs: **13**
- Economics Blogs: **1**
- News: **16**
- Reddit - Comments: **284**
- Reddit - Comments: **4**
- Reddit - Comments: **1**
- Wikipedia - Links: **9**

**Social Media**

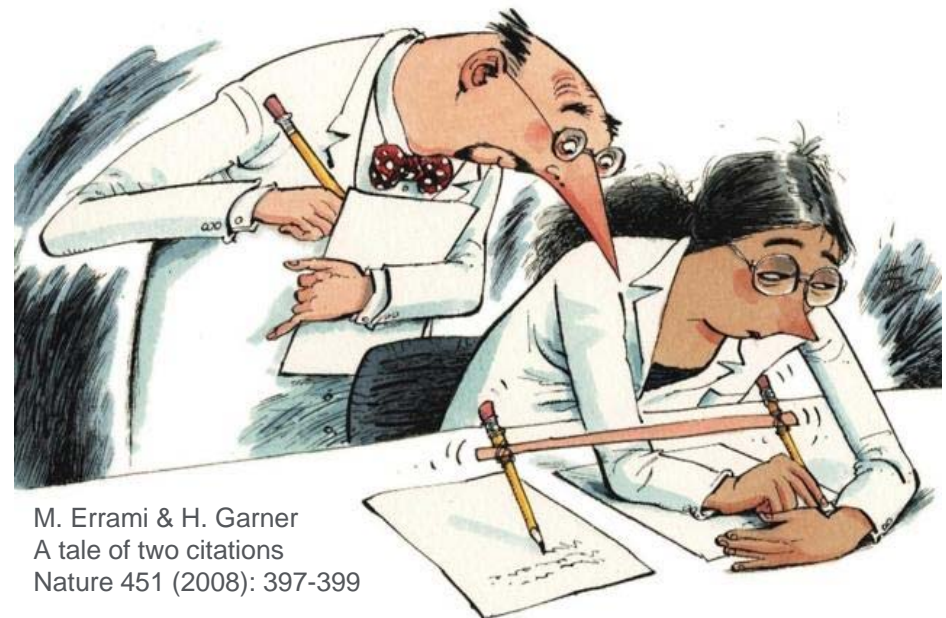
- Facebook - Shares, Likes & Comments: **157**
- Twitter - Tweets: **293**

# Ethics in publishing



## Publish *AND* Perish! – if you break ethics 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 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

# Ethics Issues in Publishing

## 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



# Data fabrication and falsification

*The most dangerous of all falsehoods is a slightly distorted truth*

G.C. Lichtenberg (1742-1799)

“... 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.”



Professor Richard Hawkes  
Department of Cell Biology and Anatomy  
University of Calgary



# Data fabrication and falsification

## **Falsification:**

- Manipulation of research materials, equipment, processes
- Changes in / omission of data or results such that the research is not accurately represented in the research record

This can include selecting data to fit a preconceived hypothesis:

- do not include (data from) an experiment because '*it did not work*', or
- show '*representative*' images that do not reflect the total data set, or
- simply shelve data that do not fit."

# Data Fabrication and Falsification - often go hand in hand

## Chinese scientists dismissed after 70 suspect paper:

[BEIJING] Two Chinese university dismissed after 70 papers they p international journal were revoked fraud.

Hua Zhong and Tao Liu, lecturers **University** in south **China's Jiang** the papers in 2007 in **Acta Crysta**

**False positives: fraud and misconduct are threatening scientific research**  
High-profile cases and modern technology are putting scientific deceit under the microscope



**Alok Jha**, science correspondent  
The Guardian, Thursday 13 September 2012 18.12 BST  
[Jump to comments \(241\)](#)



The Dutch psychologist Diederik Stapel was found to have published fabricated data in 30 peer-reviewed papers. Photograph: Hollandse Hoogte/Boxem

## SCIENCEINSIDER

Breaking news and analysis from the world of science policy

Harvard Psychology Researcher Committed Fraud, U.S. Investigation Concludes

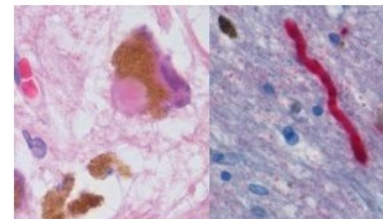
## Rising Japanese scientist faked heralded stem cell research, lab says

## Parkinson's Researcher Fabricated Data

Neuroscientist Mona Thiruchelvam agrees to retract two studies linking neurodegeneration to pesticides.

By Hayley Dunning | June 29, 2012

31 Comments Like 47 Pin It 8+1 8 Link this Stumble Tweet this



Substantia nigra in Parkinson's disease WIKIMEDIA COMMONS, FILIP EN

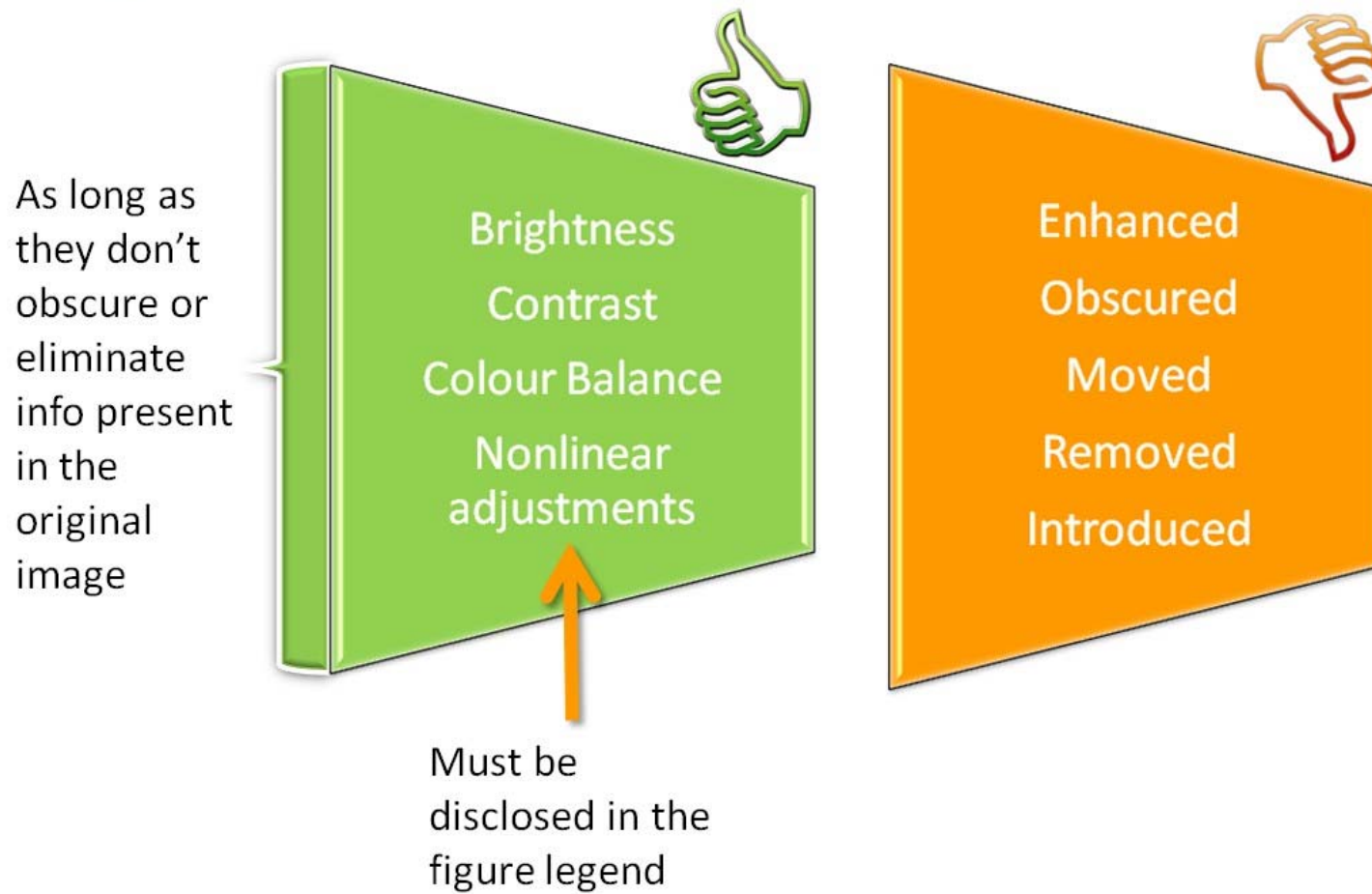
A former assistant professor at the University of Medicine and Dentistry, New Jersey (UMDNJ) committed research misconduct by fabricating data, according to an investigation by the university and the Department of Health and Human Services' Office of Research Integrity (ORI). The ORI, which announced its findings on Thursday (June 28), determined that Mona Thiruchelvam falsified cell count data published in two papers in 2005 in *Environmental Health Perspectives* and *Journal of Biological Chemistry*, both of which she has agreed to retract.

GLOBAL

## Scientists sent to prison for fraudulent conduct

Geoff Maslen 25 April 2013 Issue No:269

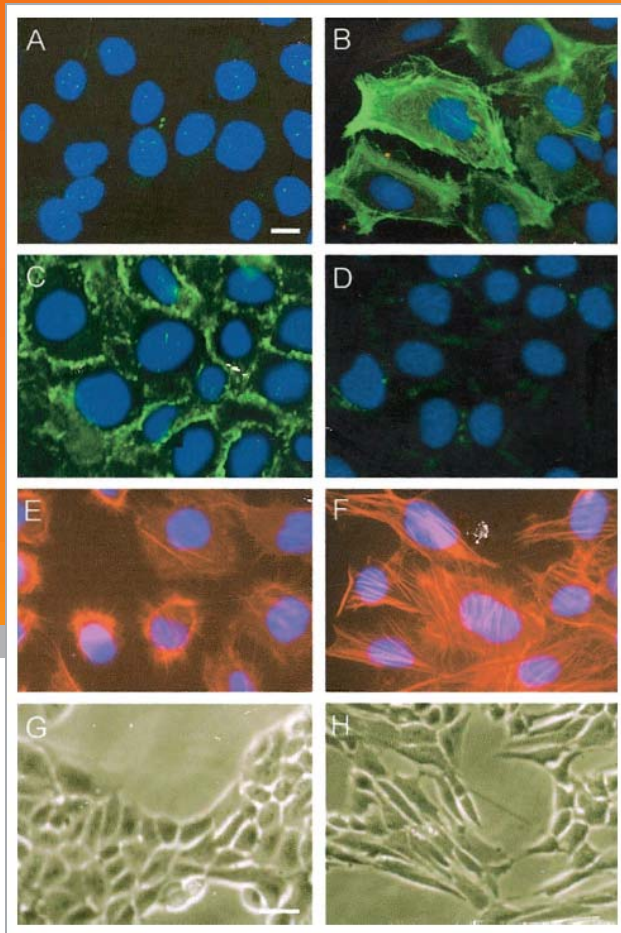
# Figure Manipulation



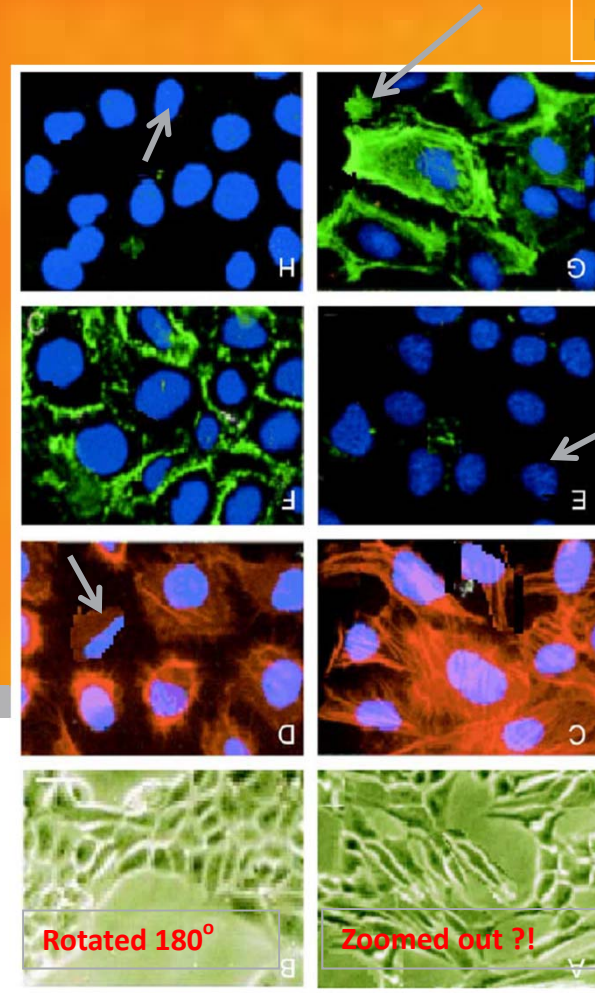
# Figure Manipulation – Example

## Different authors and experiments

Am J Pathol, 2001



Life Sci, 2004  
Manipulation



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# Ethics Issues in Publishing

## Scientific misconduct

- Falsification of results

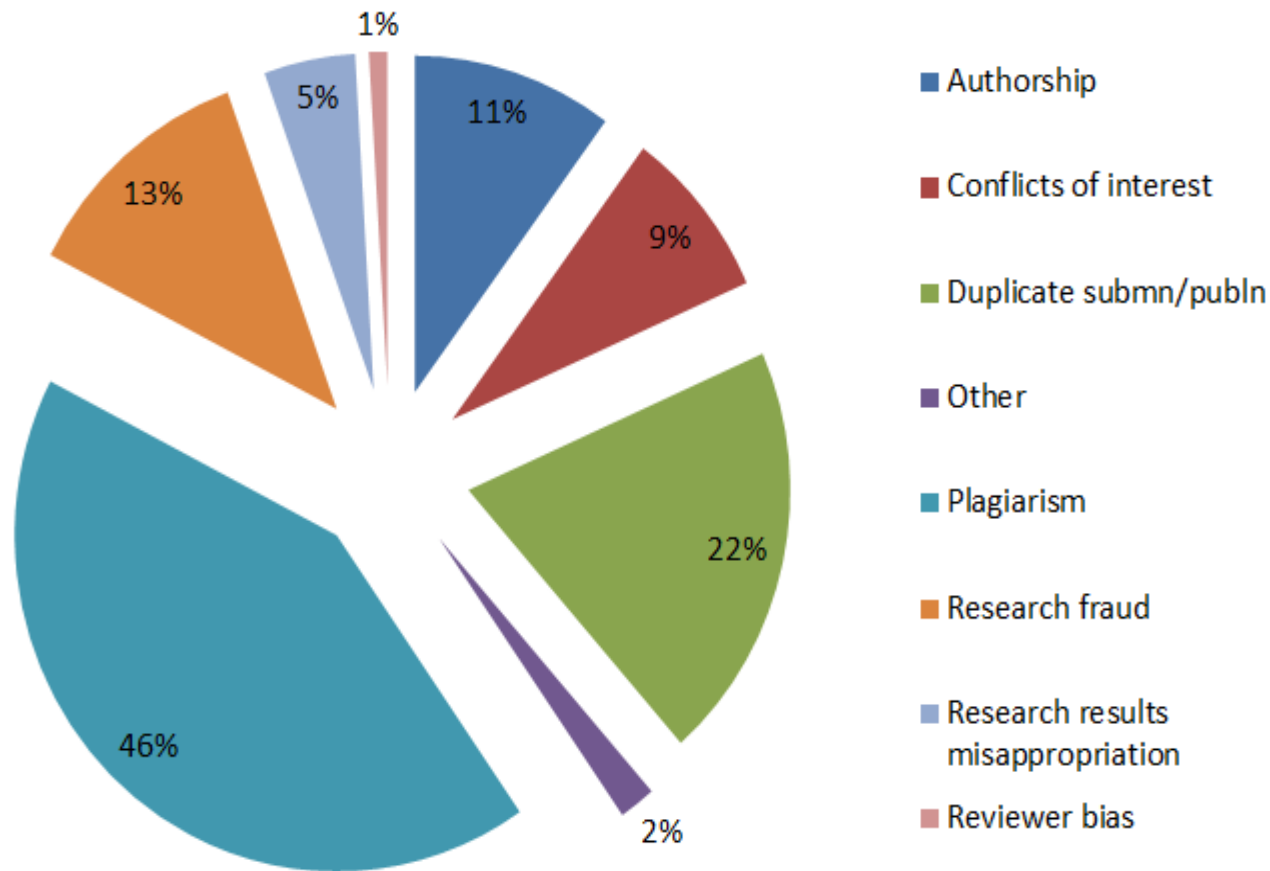
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- Conflict of interest



# Plagiarism high amongst ethics issues

*Sample of cases reported to Elsevier Journals publishing staff in 2012*



# Plagiarism Detection Tools

- 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 ...







# Retractions

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

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## **RETRACTED:** Matching pursuit-based approach for ultrasonic flaw

N. Ruiz-Reyes<sup>a</sup>, , P. Vera-Candeas<sup>a</sup>, , J. Curpián-Alonso<sup>a</sup>, , J.C. Cuevas-Martínez<sup>a</sup>, and F. Ló

<sup>a</sup>Electronics and Telecommunication Engineering Department, University of Jaén, Linares, Jaén, Spain

<sup>b</sup>Signal Theory and Communications Department, University of Alcalá, Alcalá, Madrid, Spain

Available online 24 August 2005.

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

Reason: This article is virtually identical to the previously published article: “New matching pursuit-based algorithm for SNR improvement in ultrasonic NDT” , *Independent Nondestructive Testing and Evaluation International*, volume 38 (2005) 453 – 458 authored by N. Ruiz-Reyes, P. Vera-Candeas, J. Curpián-Alonso, F. López-Campos and J.C. Cuevas-Martínez.

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

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. When the input SNR (SNR<sub>in</sub>) is lower than 6dB (the level of echoes), the method performance is above the level of echoes.

### 2. Matching pursuit

Matching pursuit was introduced by Mallat and Zhang [13]. Let us suppose an approximation of the ultrasonic backscattered signals  $s[n]$  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  $D = \{g_i; i = 0, 1, \dots, L\}$  of vectors in  $H$ , such as  $\|g_i\| = 1$ .

The problem of choosing functions  $g_i[n]$  that best approximate the analysed signal  $s[n]$  is computationally very complex. Matching pursuit is an iterative algorithm that offers sub-optimal solutions for decomposing a signal in terms of expansion functions chosen from a dictionary, where  $L$  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 sparse representations.

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 residual is

$$r^m[n] = \begin{cases} s[n] & m = 0, \\ r^{m-1}[n] + \alpha_{i_{m-1}}[n] & m \neq 0, \end{cases} \quad (1)$$

where  $\alpha_{i_{m-1}}$  is the weight associated to optimum atom  $g_{i_{m-1}}[n]$  at the  $m$ th iteration.

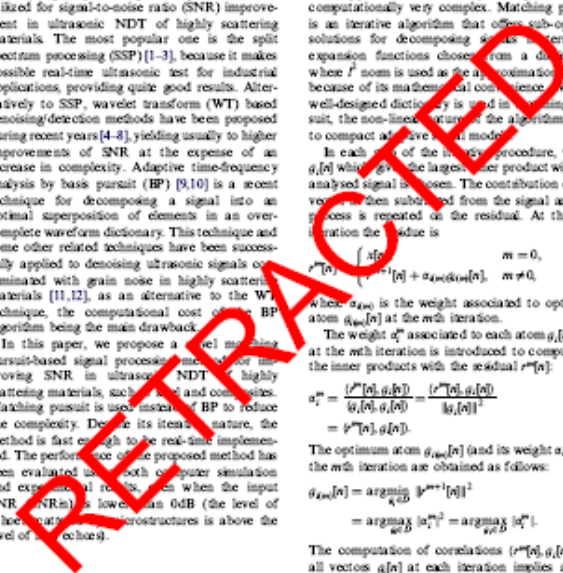
The weight  $\alpha_i^m$  associated to each atom  $g_i[n] \in D$  at the  $m$ th iteration is introduced to compute all the inner products with the residual  $r^m[n]$ :

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

The optimum atom  $g_{i_{m-1}}[n]$  (and its weight  $\alpha_{i_{m-1}}$ ) at the  $m$ th iteration are obtained as follows:

$$g_{i_{m-1}}[n] = \underset{i \in D}{\operatorname{argmin}} \langle r^{m-1}[n], g_i[n] \rangle^2 = \underset{i \in D}{\operatorname{argmax}} |\alpha_i^{m-1}| \quad (3)$$

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:

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


Articles of which the authors have committed plagiarism or fraud are not removed from ScienceDirect. Everybody who downloads it will see the reason of retraction...

# Publication ethics – How it can end .....

Some actual emails.....

*“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.***”

“Dear Editor,  
Good day! Today, I find my student (named xxx) submit a paper to you without my agreement. However, this paper is an unethical practice. ***This boy has been punished.*** Please forgive us. Again, we are very, very sorry to waste your time and work. Please withdraw this paper as soon as possible.”

## What are your responsibilities as an author?

- Report data that is –
  - Real
  - Unfabricated
  - Original
- Declare any conflicts of interest.
- Ensure proper authorship.
- Submit to one journal at a time.
- Make sure to cite others' work carefully and properly.

Thank you



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