

# Scientific Writing Series

Part 1:

Organizing and Writing Scientific  
Papers

# Writing Scientific Papers

- When does one write a paper?
  - When there is a complete story to tell
  - Before a deadline as there are always gaps - requiring more experiments.
- Where should I publish the paper?
  - What audience do you want to reach?
  - Speed (time to on-line); quality of review process
  - Open Access? Posting of pdf version?
  - Digital only? Do you need color, movies?
  - How “strong” is the paper?
  - What is the Impact Factor? the Eigenfactor?
    - Nature/Science;
    - PNAS, PLoS
    - Top journal in the field
    - National vs International
  - Cost

# Writing Scientific Papers-II

- What type of paper do I write?
  - Primary (original) contribution
    - Comprehensive
    - Short, focused; note
    - Methods
  - Review, mini-review
  - Editorial, Viewpoint
  - Proceedings chapter; monograph chapter (edited volume)
- Length -some limit pages; use supplemental mat'l
- Who should be authors, author order
- LPU' s (Least publishable unit)

# Review Process

and its changes due to e-review

- Editor' s role

- Select reviewers to cover the scope
- Make final decisions
  - Importance for new knowledge
  - Solid support, proof
  - Concise, clear

- Reviewer' s role (not decision maker)

- Importance
- Adequate design, proof
- Details are correct

- Publisher' s (copy editor' s) roles

- Check details, query author on uncertainties
- Prepare proof for author' s review (within 48 h)
- Copyright, payment

# Ranking Journals

- Impact Factor (I/F)

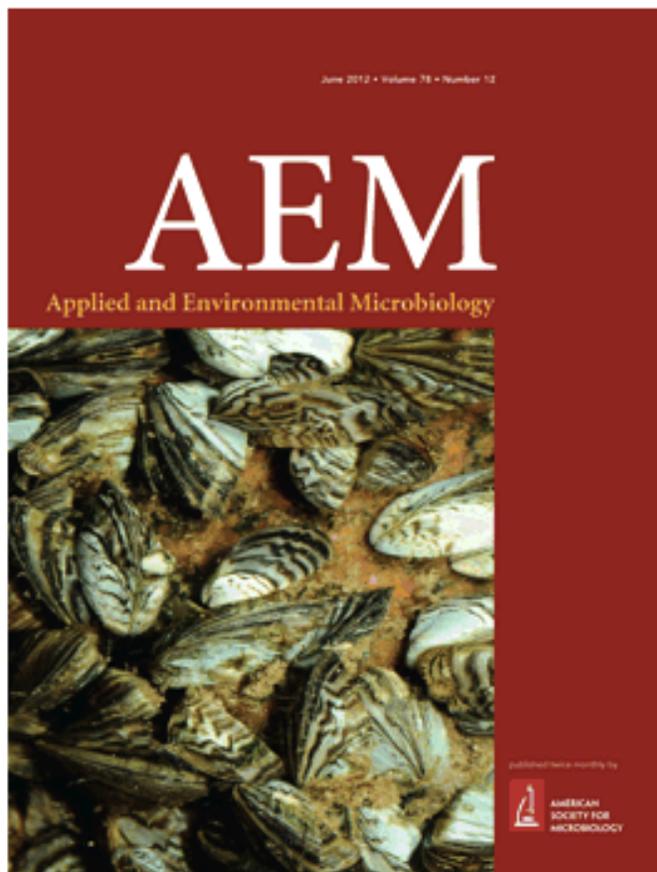
- # times cited over yrs/total # papers published
- 2009 A/B, citations in 2007-08/
- Favors big scientific fields, not a balanced science

- Eigenfactor

- The Eigenfactor algorithm is from a class of network statistics known as eigenvector centrality measures. The approach is similar to that which Google uses to return search results.
- One can view the Eigenfactor Score as the result of a random walk through the scientific literature
- <http://www.eigenfactor.org/index.php>
- <http://www.eigenfactor.org/map/methods.htm>
- Bergstrom et.al. 2008. Eigenfactor Metrics, J. Neuro Sci
- Important as this builds the stable foundation of knowledge

# Publishing Business

- Dynamic (unstable) due to electronic media
  - mergers
  - cost-cutting
    - Less quality control of product
    - Pressure on the review process
    - Electronic, hard copy or both
- Professional society vs private publisher
- Who pays for publishing?
  - Libraries (block deals)
  - Author
  - Members (if society) or subscribers
  - Advertisers
- The Future
  - Digital platforms (all content); pay per view
  - New models: PLoS One, PNAS Plus, mBio
  - Third world and scam publishers



About this AEM Cover

- **IMPACT FACTOR: 3.778**
- #1 cited journal in Microbiology and #1 in Biotechnology & Applied Microbiology, with nearly 78,000 citations
- #1 journal in Microbiology and #2 in Biotechnology & Applied Microbiology ranked by *Eigenfactor* score
- Selected by the Special Libraries Association (SLA) as among the 100 most influential journals of the last 100 years

## INSTRUCTIONS TO AUTHORS

Download pdf of these instructions 

[Expand All](#) | [Collapse All](#)

[SCOPE](#) »

[EDITORIAL POLICY](#) »

[HOW TO SUBMIT MANUSCRIPTS](#) »

[ORGANIZATION AND FORMAT](#) »

[ILLUSTRATIONS AND TABLES](#) »

[NOMENCLATURE](#) »

[ABBREVIATIONS AND CONVENTIONS](#) »

[PUBLICATION CHARGES](#) »

---

## A new model, PNAS Plus

**PNAS Plus.** All authors may submit to a section called PNAS Plus, in which research reports appear exclusively online in an expanded format up to 10 pages in length and may include limited supporting information (SI). The full research article is accompanied by a one- to two-page summary (ideally 850 words) written by the authors for a general scientific audience. The author summary is published in print and online. Authors are required to submit their summary with the initial submission, and the summary will be reviewed for clarity and accuracy by the Editorial Board, assigned editor, and reviewers along with the PNAS Plus article, following the standard review process. The summary and full article share a title and DOI. PNAS Plus articles cost \$215 per research article page, with no additional charges for the author summary, color figures, and up to four pages of SI. Please see the editorial at [www.pnas.org/content/107/35/15309.full](http://www.pnas.org/content/107/35/15309.full).

The author summary must clearly and succinctly explain the findings to a broad scientific audience (see sample summary at [www.pnas.org/content/108/14/E51/1.full.pdf+html](http://www.pnas.org/content/108/14/E51/1.full.pdf+html)). The summary should avoid acronyms, excessive methodological detail, and technical jargon, and must contain either one figure or one table that summarizes the main results of the paper. Authors are encouraged to provide a title that is accessible to a nonspecialist and should use the template at [www.pnas.org/site/misc/au\\_summary.doc](http://www.pnas.org/site/misc/au_summary.doc). A

## Tips for Writing Scientific Papers

J.M. Tiedje, 2012

1. Organizing your writing project.
  - a. Define the take-home message first so that the organization and contents can be selected and arranged to effectively communicate that message.
  - b. Sketch out the possible tables and figures; construct them to make their conclusions easy to see and understand.
  - c. Make an outline of the contents at the level of paragraph topics.
  - d. Possible order of writing: M&M, Introduction, Results, Discussion, Abstract, Title.
  - e. Ninety percent of papers are better done with Results & Discussion separate.
  
2. Writing Tips.
  - a. Consider the editor's criterion: "What is the minimum length needed to convey the new contribution to knowledge?" This is very different than reporting all your neat and hard earned data. The editor is under constant page budget pressure so is looking to cut length or reject. Campaign against wordiness! (idea: after achieving a good draft, read only for the goal of condensing, tighter wording)
  
  - b. Write clear paragraphs, with a purpose. Use topic sentences, logical flow, and a conclusion.
  
  - c. Do not waste a sentence simply announcing a table or figure.

- c. Do not waste a sentence simply announcing a table or figure.
- d. Length guidelines (double spaced)
  - i. Abstract: Not over 1 page
  - ii. Introduction: 1.5 pages, not more than 2
  - iii. Materials and Methods: Only the information needed for someone skilled in the field to understand the work, and to repeat it.
  - iv. Results: Often shortest section if tables and figures convey findings. Citations should not be in Results.
  - v. Discussion: 3-5 pages, never more than 6 (or the reader will be asleep).
  - vi. Number of tables and figures. When outlined or drafted, rank tables and figures in order of priority for deletion (e.g. if editor says to delete x nos.) to help you establish which appears to be of least value, or secondary to focus, and consider deleting or converting to brief text form.
- e. Discussion should not repeat Results. Discussion should be a comprehensive level of synthesis and interpretation of the new data, as well as placing it in context with previous work. Share an overall perspective/insight when possible. Lead discussion with strength, the stronger points you want remembered. The Discussion topic order should not necessarily be the same as for the Results

The closing paragraph is important but should not repeat in the same way what was already said or is in the abstract.

Apportion background between introduction and discussion for logical development/flow, and to avoid repeating same topic both places.

- f. There is no one correct version for a paper, but likely many that will communicate the same findings effectively.

3. Some grammatical suggestions:

- a. Minimize use of dependent phrase or clause to start the sentence.
- b. Good writing minimizes the use of 'However' to start a sentence, but instead use it in the sentence.
- c. Use first person active voice (I, we, measured. etc), and not third person, passive voice. Avoids vagueness about who did what and wordiness.
- d. Use parallel structure for two or more phrases or objects of action, for clearer understanding.
- e. Avoid jargon (scientific terms made into verbs, e.g. centrifuged, or lab slang for describing something).
- f. The work you are reporting should be in past tense (you have completed it in the past), but discussing previous work is present tense since once published it is current knowledge and hence present tense. But, if referring to your work in a figure or table that implies action (looking) at the time, it can be present tense.
- g. Avoid wordiness by including phrase that repeats aspects of the study that is already clear from the context of the paper or paragraph.