

Anatomy of a Journal Article

Title/Authors

Abstract

- I. Introduction
- II. Methodology
- III. Results and Discussion
- IV. Conclusions

Acknowledgments

References

Why journal articles?

- Communicate scientific results
 - Advance progress of humanity
 - Blah blah blah
- Show off your stuff

Types

- Letter – small article that is hot topic so should be published fast
- Article – typical format to present results
- Review article – summary of a research area, usually doesn't have new results but summarizes research topic

Article is story

- describe background
- describe question to be answered
- describe what happened
- describe your answer
- describe why it matters/significance

Title and Authors

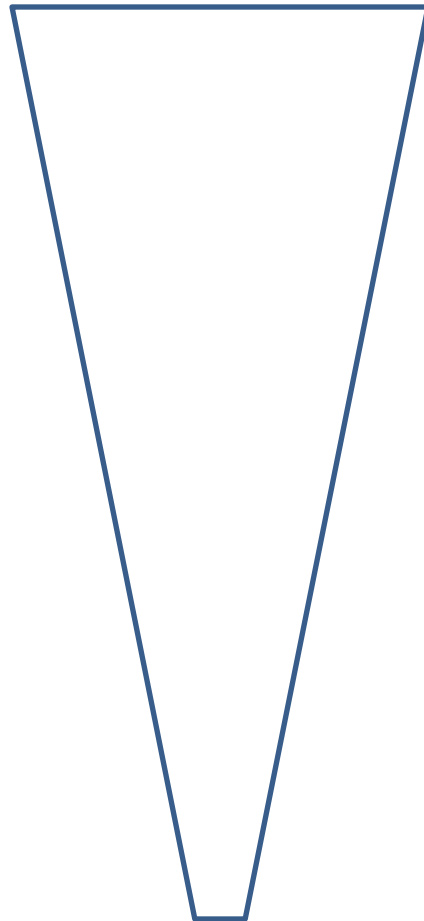
- What article is about
 - Short, Descriptive
 - No fluff
- Who wrote or contributed to work
 - Typically first author wrote or did most of work
 - Typically last author is 'senior'

Abstract

- Short summary of the work
- Should tell you 'everything' you need to know in one paragraph
 - explains why research was done
 - summary of methods, results, conclusions

Introduction

- Provides the background for the ‘un-educated’
 - Assume readers knowledge of field is limited



General

What is field of study?
Why is it important?

What has been done?

Specific

What are we doing?

Citations

- Acknowledge previous work by others
- Provide background for ‘story’
 - Helps reader understand the area of research
- Unless knowledge is common, cite it!
 - Example
 - Formula for methane is CH₄. [no citation needed]
 - Heat of combustion of methane is XYZ kJ/mol. [citation needed]

Methodology

- How we did what we did
- Enough details so others can reproduce work
 - Basis set
 - Pseudopotentials
 - Code used
 - Structural model
 - Simulation Parameters
 - Simulation Procedure

 - Equipment used
 - Chemicals used
 - Procedure

Results/Discussion

- What we did and what our results mean
 - Present and describe your results
- What questions do we answer?
 - Provide support from results
- How do our results differ than others?
- What new insights do we provide?

Figures/Tables

- “Meat” of article
 - Key information
- Should be easy to look at
- Most people will scan figures to understand article

Conclusions

- Summarize results
- Summarize key findings
- Summarize new contributions to science
- Typically 1-3 paragraphs

Acknowledgements

- Thank those who helped but didn't contribute directly

Questions to Ask

- Is methodology correct?
- Do results make sense?
- Do results support conclusions?
- Is there anything missing?
- What is the significance of the work?
- What is the next step?

Distribution of Journals

- Top
 - *Science, Nature* (very general)
- Middle
 - *Surface Science, Journal of Physical Chemistry C*
- Bottom

Rankings on isiknowledge.com – journal citation reports

(usually by number of rankings)

Where to look

- Sciencedirect.com
- Isiknowledge.com
- Pubs.acs.org
- Most journals have RSS feeds, or new article alerts
- References to articles you already have
- Citations to articles you already have

Resources

- <http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html>
- <http://www2.fiu.edu/~collinsl/Article%20reading%20tips.htm>
- <http://www.columbia.edu/cu/biology/ug/research/paper.html>
- <http://classweb.gmu.edu/biologyresources/writingguide/ScientificPaper.htm>