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?

Specific
  What has been done?

  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