

The most important thing in your career.

Types of research reports:

Journal article
Conference paper
Abstract
Hour lecture
Short talk
Poster presentation

[Also note: review article, grant proposal, opinion piece, thesis...]

Goals for scientific writing:

Overall: clarity! Communication to an audience of scientists
Statement of significance (Introduction)
Reproducibility of the methods (Methods)
Presentation of all relevant results (Results)
Implications (Discussion)
Acknowledgement of related work (Citations)

Narrative vs. Argument: a critical distinction. What is the claim you are making?
Why does it matter? What are the alternatives? What is the evidence for it?

Think about your audience. What do you want them to believe when they have finished your paper? How are you going to convince them? What are the challenges to getting them to believe you? How will you address each? Note that many readers of scientific papers these days are not native English speakers. Have mercy on them.

How are manuscripts evaluated:

Novelty: is this the first disclosure of these results, this method, etc.

Reviewability: does it contain enough information to assess the observations reported, repeat the experiments, evaluate the intellectual processes (e.g. justify the conclusions reached).

Significance: if it were true, would it matter?

Clarity: Do I understand what is being said?

Methodological soundness: were the right methods (including statistics) used, and were they used properly?

Contact with the literature: were the right prior publications cited in the right places?

Some practical suggestions:

Imitate shamelessly. Look at other papers in the journal you are targeting, and imitate the style that they are written in. Imitation is a great way to learn a writing style.

Read the “instructions to authors” for the journals you care most about.

Get a style manual (like the Day book, or Strunk and White) and keep it close at hand. Try to avoid metaphors, flowery language, even most adjectives and adverbs. Describe your work with clarity and as simply as you can.

Do the figures and tables first. You have them from your work. Often the easiest way to write a paper is as a lead in to the killer figure.

Write as you go. Make detailed notes about what you are doing every day (computational biologists should keep lab notebooks!) and raid them for methods sections, etc.

Don't start at the beginning. Write the methods and results sections first, and the introduction last. It's easier to figure out what belongs in the intro after you know what the rest of the paper is going to say.

Start with rough drafts and notes to yourself. Revise, revise, revise, get input from others, then revise some more.

Get input from others. Even if a comment misses the point, it tells you that you are not getting your point across. If you disagree with something a commentator says, think about including the argument in the text.

Think about the reviewers. Who is going to decide whether this manuscript is published? What kinds of things do they care about? Again, look at other publications in the same journal, and think about imitating their style.