

# Weitzlab Guide to Good Paper Writing

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These are suggestions for writing better scientific papers. However, please remember that, like all cases with the English language, these are not rules, but are guidelines, and there will certainly be times that they do not apply or that they should be changed. Nevertheless, do this only with care and foreknowledge.

## Conclusion:

- Start with the conclusion first. Make it one sentence, two at most. Have a single, key point you are trying to make. If you write this first, then you can write the rest of the paper to just make this point.

## Main point of the paper:

- *A short paper* (Science, Nature, PRL or other letters journal) can only make one main point, and perhaps half of a second point.
- *A longer paper* can make an additional point. However, rarely can a single paper make more than a couple of points. There should always be a central point for each paper.

## Formula for the introduction: Write this *after* you write the conclusion.

- Establish that the general topic related to the conclusion is interesting and important, preferably both scientifically and technologically
- A lot is already known – review the literature very concisely
- There is one key thing that is still unknown, without which we can not progress
- This key thing is exactly what your concluding sentence is
- New paragraph: This is what this paper is about.

## Figures:

- Choose the figures, and write captions. These should be chosen to make the point that is your conclusion. Having the figures chosen first will make writing easier.
- Discuss the figures in the text. Guide the reader through the figures in the text of the paper. The reader should not have to stop and read the caption to understand what is in the figure and why it is important. Note that this is not a universal rule: both Science and Nature prefer to have a very detailed caption, with very little discussion of the figure in the text.
- The discussion of a figure should appear where it is natural. For example, if there are several pieces of data that are compared in the figure, each set can be discussed in separate places in the paper.

## Outline:

- You are trying to make the point of the conclusion, and you are trying to provide the most convincing case to the reader. This will often mean presenting things in an order that is different than the way you discovered the conclusion; don't be historical, be as clear as possible.

**Readability:**

- *All papers* should tell a story and should be interesting for the reader to read; this will help ensure that they are read, understood, and therefore people pay attention to them, which is the purpose of writing a paper.
- *Long papers* can sometimes follow the traditional format of Introduction, Experiment, Results, Discussion and Conclusion. However, they often will be clearer by not following this format. The format chosen should match the best way to make the point of the conclusion.
- *Short papers* (Science, Nature, PRL or other letters journal) should tell a story. They will rarely follow the traditional format above. Instead, they will present the results in a way that most clearly makes the point.
- *Story*: Here is a trick when presenting data. See if there are two parts of the data that help make the point. Use the first part to establish the point, but leave some aspect of the point as a hypothesis that needs to be tested. Then use the second part of the story as a proof of the hypothesis. This often can be used, but not always.

**Grammar:**

- Generally use the present tense. It makes the paper more immediate. You can also use the past tense for things that you did in the past in order to set up your experiment or measurements. However, this has to be done carefully. A simpler thing is to simply use the present tense for everything.
- Do not use parentheses in text; if something is not important enough to put in the text, it does not need to be there – there is no reason to put it in parentheses.
- Do not use ie.; this is generally lazy writing.

**Order:**

- Pay close attention to the order of your structure. Put things in the most logical order. For example, when you are describing your experiment, keep logical portions together. It is usually not a good idea to mix the description of the experiment with the results, although in a short paper, this is often not the case – there, you may not have a separate experiment section, and thus may want to introduce new experimental techniques as they are needed.

**Segues:**

- Segues are the sentences that join one concept to the next. They are the sentences that start a new paragraph and introduce a new concept. They are very important for the readability of the paper. Never use trite segues like:
  - “We now describe such and such.” This is very commonly done. However, a line like this is totally redundant, and simply reflects lazy writing. You don’t need to say what you are going to do; just do it. Find a more appropriate segue.
  - “Such and such has been of interest over the past few years.” This, or variants like this, are frequently used as starting sentences for a paper. Again, this is totally redundant, and is lazy writing. Of course the topic is

interesting, otherwise why would you be writing the paper, and why would the reader be reading it? Find a better introductory sentence.