

**Field:** What field does your research fall into?

**Target audience:** Who do want to read your paper? Who is it for?

**Target Journal:** What journal you want to target the paper too? (Think back to the topic/field and target audience.)

**Secondary Journals:** Other secondary journal options where your paper might also fit.

**Article Type:** Article type from the target journal – link to Author Guidelines

## **Paper Outline**

*“Remember to think of a paper as a collection of experimental results, summarized as clearly and economically as possible in figures, tables, equations, and schemes.” – Whitesides*

**Working Title:** Give your paper a working title (I use Working Title because it will likely change many times, especially, if you just in an early planning phase).

**Authors:** List of authors

**Author contributions (if applicable):** Many journals now require author contributions be listed, so list the main contributions of each author, or alternatively, list their expected contributions if planning your research.

### **1. Introduction**

**Purpose/Objective (What?):** What is overarching purpose or main objective of the research? What is the main problem you want to solve?

**Justification (Why?):** Justify your Purpose/Objective. Why is it important? Also think back to your target audience - Why should they care?

**Hypothesis:** What is the central hypothesis that you are testing?

**Background:** Who else has done what? How? What have we done previously?

**Guidance to the reader:** What should the reader watch for in the paper? What are the interesting high points? What strategy did we use?

**Summary/conclusion:** What should the reader expect as conclusion?

*“If you start the research to test one hypothesis, and decide, when you see what you have, that the data really seem to test some other hypothesis better, don't worry. Write them both down, and pick the best combinations of hypotheses, objectives, and data. Often the objectives of a paper when it is finished are different from those used to justify starting the work. Much of good science is opportunistic and revisionist.” – Whitesides*

### **2. Results**

**Primary results:** List out the primary results you have (or expect to have if planning). How do they relate back to the Purpose/Objective and Hypothesis?

*“This section should be organized according to major topics. The separate parts should have subheadings in boldface to make this organization clear, and to help the reader scan through the final text to find the parts of interest.” – Whitesides*

**Figures/Tables:** Organize your results in figures and tables, provide a figure/table list with captions.

**3. Discussion** (Some journal formats don’t have a separate Discussion section, and instead they have a combined Results and Discussion section. But for the outline this can probably be maintained as a separate section.)

**4. Conclusions** (Some journal formats don’t have a separate conclusions section, and instead the conclusions are folded into the Discussion. But for the outline this can probably be maintained as a separate section.)

*“summarize the conclusions of the paper as a list of short phrases or sentences. Do not repeat what is in the Results section, unless special emphasis is needed. The Conclusions section should be just that, and not a summary. It should add a new, higher level of analysis, and should indicate explicitly the significance of the work.” – Whitesides*

## **4. Experimental/Methods**

**Experiments/Simulations:** What experiments or simulations have you run? If you are just planning your research: What experiments or simulations do you need/want to run, and what results will they yield?

## **5. References**

1. Whitesides, G. M. (2004). Whitesides’ Group: Writing a paper. *Advanced Materials*, 16(15 SPEC. ISS.), 1375–1377. <https://doi.org/10.1002/adma.200400767>