

Writing is easy. All you do is stare at a blank sheet of paper until drops of blood form on your forehead.

Gene Fowler

Brilliance has an obligation not only to create but also to communicate.

J.R. Platt

The trouble with most of us is that we would rather be ruined by praise than saved by criticism.

Norman Vincent Peale

Proofreading and Revising Your Manuscript.

- Critique the paper for:
 - clarity
 - organization
 - incorrect grammar
 - simple and concise descriptions/definitions of key terminology
 - convoluted or run-on sentences
- Use the key sentence method for proofreading and revising.
 - A key sentence articulates the main point, claim or idea of a paragraph or a larger text. Strong key sentences enable the author to write with clarity and organization.
 - The **thesis of the paper** should be described in a key sentence that is underscored/supported throughout the article.
 - Each paragraph should contain a key sentence. In scientific writing the key sentence is often the first sentence in the paragraph, but it need not be. The key sentence should (1) express the topic of the paragraph (2) be central to the paragraph such that all other sentences provide the necessary details, descriptions, and proofs to support it, and (3) be noteworthy and concise.

Organizing and writing your manuscript:

- Sectional organization – write figures first (should already be done)! Then write easiest – Figures and the methods. Work on results then discussion. Don't do the introduction until you know what to introduce.
- Follow a cadence or algorithm for each section. Keep the flow going, wordsmith later.
- **Start** with your initial hypothesis then layout the figures.
- **Next** consider your hypothesis as a story.
 - Use the figures and the hypothesis to determine one, two or three summary statements; questions your studies will answer. The hypothesis and summary statements should organize each section of the manuscript. These are the take home message or question your paper answers.
 - Use short sentences which use cause and effect words (necessary, influence, predict, causes) to generate your summary sentences.
 - Get your story to an elevator speech and stick to the point throughout the manuscript.
- **Figures:** Work on details for publishable quality figures– too specific for this presentation.
 - Include rough drafts of legends. Use summary statements for headers of each figure legend to help organize the thoughts.
 - Arrange the figures in order to tell the best story not always chronologically.
 - Creating and arranging the figures first helps to determine what is needed. Spread out the figures on a poster or the wall. Review the figures (feedback) and determine if they are in the right order for your story. Analyze if there are too many or unnecessary figures?
 - Present work in a manner which best tells the story – analogy for papers is that you are a lawyer arguing a case... present the witnesses (experiments) to the jury in the most clear and logical order -- one that tells a story. This is not necessarily the order in which you originally interviewed them.
- **Methods:** Pay attention to the Journal's style guide (wrong style can irritate reviewers). Methods must have enough details to allow someone to repeat the experiments.
 - Organize in order of figures/results section. Written in past tense with a passive voice, avoid first person.
 - Often looked at much more closely by editors and reviewers than one might imagine. This section should allow reviewers and readers a clear way to understand how the studies were conducted.
 - Include relevant information on animal and human studies (IRB/UACUC) how subjects were included or excluded.
 - Less information on materials is included than 15 – 20 years ago, but don't forget specific specialized reagents, antibodies, oligo reagents...
 - Avoid referencing methods that are references themselves.
 - Create the section in small segments in a logical order – use subheadings.
- **Results:** This section is used to 1) report results and present how this data supports the hypothesis.
 - Written in past tense with summarizing data in present verb tense. Avoid discussing the findings.

- Organize the results in the same order as materials section for clear reading – may even use same basic topic sentences or subheadings as in figure legends.
- There is a very straightforward rhythm to the results section. Use the algorithm: because of this (earlier study, data presented in the MS or other’s work) we asked this question (sub-hypothesis). To do this we did this... experiment. Follow with description of results with final comment.

As constitutive activation of Erk-MAP kinase has been implicated with upregulation of uPAR in several human tumour types (Hoshino and Kohno, 2000), we investigated whether p42/44 Erk-MAP kinase activity plays a role in the regulation of uPAR expression in HCT116 cells. In vitro kinase assay, specific for p42/44 MAP kinase activity, showed approximately two-fold higher MAP kinase activity in WT and mock-transfected HCT116 cell lines compared to A/S cell line (Table 2). British Journal of Cancer (2003) 89, 374 – 384.

Alternative regioisomers 3-chloro-2-aminopyridine and 2-chloro-3-aminopyridine and the more reactive 4-amino-3-bromopyridine also did not couple with borolane 5 beyond 3% yield under these conditions. To eliminate the possibility that ethoxyvinylborolane 5 cannot couple or decomposes under these conditions, it was tested in a reaction with 4-chloroaniline 7, previously shown to couple efficiently with a range of borolanes.(21) This reaction was successful, giving 52% product (entry 1, Table 2). J. Org. Chem., 2010, 75 (1), pp 11–15

- Key transition phrases between data groups include... “Having shown... we next examined / determined, these results suggest that...” Read through accepted MS in the journal you plan to publish in to identify key results words that do not interpret. Examples include: associated, correlated, significantly, apparent, ... having these phrases and words will greatly speed up the writing process.
- **Discussion:** Often the hardest section to write during the school year. The purpose of this section is to answer the key questions from the hypothesis, fit the findings with existing knowledge, and convince the reader/reviewer with the approach and limitations of the results.
 - Written in present tense and is often written in the active voice.
 - Start with a paragraph reviewing main thrust of results – highlighting only the most key points. Keep in mind the summary statements. Clearly write how this study answered these questions and the degree that the described work advances the state of knowledge. Finish the initial paragraph with a clear statement indicting the significance of the MS. This paragraph should only be a few sentences long.
 - Identify the main results from each section of the results and figures – then add in causality. i.e. find a mechanism to explain/interpret the results.
 - Do not overstate the significance or novelty. Use terms and phrases such as: “probably”, “is likely”, “one possible interpretation is...” to avoid sweeping or overly enthusiastic conclusions.
 - Discussion words (different from results words): those that infer mechanistic causes and effects from data presented in the results section: “influences, sufficient, necessary, associated can be used if needed to soften if the link between cause and effect are less clear.
 - Overall flow of discussion: opening paragraph, explain results, indicate originality and importance of study, discuss unexplained or expected findings and how findings concur with others.
 - Concluding paragraph: restate logical conclusions and why the study is relevant. Then add how further studies could further your work or substantiate the findings of the MS.
- **Introduction:** Write this last as your understanding of where the paper is going will have matured at this point. Also there is no need to introduce what is not discussed.
 - Past tense for much of the introduction. When discussing established facts, switch to present tense.
 - Introduction answers three questions: 1) what is the big picture or question, 2) what is the specific question, 3) what don’t we know/how will this study help?
 - A clear statement of the hypothesis and main questions early in the introduction will help focus the reader’s attention.
 - Start with a summary of the subject and literature to provide reviewer enough information to understand the main points of the results and discussion, how these points expand the body of understanding and to allow the reviewer to better understand how the work is worth publishing.
 - Second illustrate and introduce what is unknown or problematic. Identify gaps and disclose similar studies to those presented in the MS.
 - Close with a clear declarative paragraph of the problem you have answered. Remember your hypothesis and summary questions when writing this paragraph. Include a simple summary of the most important finding(s) of the paper. “...in the current study, we demonstrate that...”, “the purpose of this study was...”, or “this study was undertaken to...”.
 - Review your introduction when finished. Does each sentence contribute to the summary statement described above? If not, delete.
- **Abstract:** Simple statements. (mixed tense)
 - First sentence is the question asked with one or two sentences on background if word limit allows (present tense).

- Research approach to answer the question (past tense).
- Most significant findings (past tense).
- Answer the question posed in the beginning of the abstract (present tense).
- If space allows – include a speculation of the implication of the study.
- **Title:** Now – write the title for the manuscript. Incorporate a positive statement from the summary statement found at the end of the discussion and introduction.
- **Hypothesis and Data Review.** As you get to the summary statements, finish the figures, complete the results section work through the discussion and create the final conclusion paragraph, review the data to see if the data, results and discussion all point to the main hypothesis. Does this story still match your summary statements? Review and revise to keep a clear story. This is especially important for when a MS is written in the middle of many distractions a semester will bring.