**Writing a Discussion Section**

Purpose

* Summarize and **interpret** your results.
* Give context to your findings by comparing them to other studies.
* Make suggestions for future research directions.
* Relate your findings to the broader context.

The Discussion section should be an in-depth analysis of everything you’ve covered in the previous sections. The ultimate goal, however, is taking your results and comparing them to the original questions/objectives presented in your Introduction in order to better understand the biology of the system you were studying.

Summary

* You should briefly summarize key points of the manuscript:
  + What was the goal?
    - Example: “In this experiment, we tested the effect of salt concentration on algal growth.”
  + State whether your hypothesis was supported or unsupported
    - Example: “Our results supported our hypothesis.”
  + Summarize your results.
    - Example: “Algae utilizing 2% salt had nearly double the cell density of algae utilizing 1% salt.”
  + You should keep the summary as short as possible. For the experimental complexity expected in this course, you should have no more than one short paragraph.

Interpretation

* You should **interpret** your findings; what biological explanation could explain why you got the results that you did?
  + This is, debatably, the most important part of the whole manuscript.
  + Your interpretation should be biological.
    - If your results were what you hypothesized, this might be the simple process of stating the rationale behind the hypothesis.
    - If you got unexpected but consistent results (little variance within treatments), you should provide a reason why the organisms responded in that manner.
    - If you have highly variable results, you should try to determine how the methods you used might have not had the biological effect you expected them to have.
  + You should make use of references to support your interpretation. This also contextualizes your study in a broader scope of scientific inquiry.
    - Do other studies support your interpretations? If not, is there a specific difference in species or methodology that could explain the disagreement?
    - You do not need to find studies identical to your own, although they should be investigating the specific biological phenomenon you are.
    - If there are no sources to support your interpretation, make sure to clearly indicate that your interpretation is speculation, and that more experiments should be performed.

Suggesting Future Research Directions

* You should provide a couple different suggestions for future scientists who are studying the biological phenomenon you are.
  + Usually, these address new questions raised by the results of your study.
  + It is also common to suggest trying the same study with similar species or slightly different methods.
  + Suggest different methods if you think yours are responsible for unexpected results.
  + Generally, avoid suggesting large sample sizes unless you think this was a specific issue for your study.
* You should use this as an opportunity to discuss why studying this biological phenomenon is worthwhile. This could be because:
  + ...it is economically or environmentally beneficial, or otherwise has human relevance.
  + ...it advances scientific understanding in a broad manner.
  + ...it supports the findings of other studies.

Dealing with Unexpected Results

* The Discussion is where you address unexpected results. This may be fully addressed as part of the interpretation, or may bridge the gap between the interpretation and suggestions.