

Introduction Outline due April 8th (20 points) Biol/Neur 313, Spring 2024, Dr. Wallace

The **Introduction Outline** will serve as a starting scaffold for your final written report. Like the papers you've read throughout the semester for your journal reflections, the introduction outline should "set the stage" for your experiment by including background, experimental justification (i.e. how your experiment actually relates to what you've talked about so far), and hypothesis. This introduction outline should be in bullet point form, but note that the content in the bullets should be fully fleshed enough that I can interpret them and provide feedback (if you want to do full sentences in each bullet that's great!). Minimum one page double spaced. The introduction outline must include (at least) five relevant primary literature articles that support your introduction cited in the text like this (Wallace et al. 2024).

Note: *Lab reports, including the introduction outline, must be written individually! I acknowledge that some content and primary literature articles may be referenced across multiple student reports because of the limited neuroscience work in *Betta splendens*. If there is more overlap between students' reports than would be normally expected, I will meet with each student individually and if necessary ask for a partial rewrite. Please do not "game plan" with your groupmates to try to avoid overlap- I want you to complete the assignment based solely on your own perspective.*

Introduction Outline Grading

Primary Literature References (5 references, 2 points each)

Background Explanation (4 points)

Experimental Justification (2 points)

Hypothesis (2 points)

Bibliography (2 point)

Tips

- I recommend the inverted pyramid framework for introductions: start out broad, then get specific as you progress through the introduction. Similarly, a typical scientific intro proceeds by:
 - (1) explaining what we know on the broad topic
 - (2) highlighting a gap in the knowledge
 - (3) explaining how your work will address the gap in knowledge
 - (4) describing what you expect to find (conceptually, not literally).
- In the "background explanation" section of the grading, I'm evaluating whether the introduction logically leads to your experiment. In any scientific intro, the reader should be able to follow along each step without getting distracted or confused.
- The primary literature articles don't *have* to be papers in *Betta splendens*, but when possible they should be *Betta* or fish specific.
- You absolutely can use review articles to count towards the five, but they shouldn't *all* be review articles.
- In the bibliography, I personally use Chicago Citation Style but use whatever style you like.

Final Lab Report due April 28th (30 points) Biol/Neur 313, Spring 2024, Dr. Wallace

The Final Lab Report is the capstone of your research experience during this semester! You've worked hard to develop your hypothesis, collect and analyze data, and generate results. Now to tie it all together, your report will document those steps while adding the conceptual context needed to explain your question, justify your experiment, and interpret your results.

Importantly, I am not providing incredibly detailed instructions on what exactly to write/include in your sections. This is intentional! The learning objective of this report is not for you to tell me what you did in the lab (I know that already), but to train and show your skills developed over this semester in connecting experimental results to the broader topics both from class and scientific literature at large.

I will be grading your final reports in a similar way to how I review papers for publication.

That means the best way to get a good grade on this assignment is to take a look back through the primary literature articles we've read this semester! How do the authors walk you through the relevant background research? How do they introduce their question and justify their experiment? How do they talk about limitations and future directions?

***Note:** Lab reports, including the introduction outline, must be written individually! Also, the best report is not necessarily the longest one! Trust me, I've seen 2-pager reports that have clearer lines of thinking and explanations than 20-pagers. Be clear and concise.*

Final Report Grading (all page minimums are at 1.5 space)

Introduction (8 points) & Hypothesis (3 points) *Minimum 2 pages*

The qualities I'm assessing the introduction and hypothesis will be the same as the Intro Outline, so please review those instructions. Importantly, make sure to justify *why* your research question is important and what larger context it fits into. For example: *Why are bettas a useful model for your question? Why should we learn more about neural activity in this region?*

Methods (3 points) & Results (3 points) *Minimum 1 page*

Your methods should include details that are relevant to answering your question. This may include information like: *What is PS6? How long did the fish interact with the stimulus? How did you quantify neural activity?* I do not expect you to write results on something we did not know about, such as how the fish were kept or how the fixative agent (4% PFA) was made..

Results Figure(s) (3 points) Make sure your figure(s) are clean, readable, and easy to interpret.

Discussion (5 points) *Minimum 1 page*

The discussion should interpret your results, assess whether those results support your original hypothesis, link it back to the original statements in your intro, and suggest future work. As commented in the Intro Outline, use the hourglass method to both start and end your Lab Report with a larger scope. In all your effort writing about the trees, don't forget to write about the forest!

References & Bibliography (5 points)

You should include at least 10 primary literature articles cited. Please include a bibliography like you did in your introduction outline. When in doubt about citation, cite! Even broad statements such as: *"The lateral septum coordinates social responses"* *"Betta splendens have been bred for aggression"* *"PS6 is a neural activity marker"*