Lab 3 Worksheet: Peripheral Circulation and The Dive Response

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Instructions - Individual Worksheet

- Please pay attention to the **intellectual content** contained in each section of this **worksheet**.
- Our goal here is the practice logically laying out our **ideas** focusing on ***physiological mechanisms***.
- Section (1) is designed to guide you to building strong hypotheses, section (2) is essential knowledge for both hypotheses and designing your figures, and guiding your (3) results and (4) discussion sections, respectively. Everything on worksheets are brief.
- You may use the Word template or just type up your worksheet for submission. Include the statements of purpose below. For section 2 write a brief sentence for what you would expect to see in the data. Be concise, to the point (no extra words)! Results and Discussion are in paragraph form.
- Notice how much we are emphasizing brief, concise, to the point!, and relevant. *Right, Relevant, Righteous!*

(1) Statements of Purpose

> **Tip**
>
> *In a scientific paper, the introduction builds to a statement of purpose (or hypotheses) in the final paragraph of the intro.* The statements you see below are examples appropriate for this lab. Study them to guide this assignment, and for future experiments where you will have to write your own. Notice that the physiological mechanisms and the associated variables are clearly stated, along with the hypothesized relationship between them (and experimental design if you can!). In a full paper (or lab report), your introduction would start from the main idea, introduce the mechanisms and connect the dots to the hypotheses in the final paragraph.

Use these statements of purpose to frame your thinking about this lab, fill in the blanks:

Distance from heart – "We demonstrate the predicted drop in blood pressure with distance from the central pump. We explore whether there is a greater drop in systolic or diastolic pressure with distance" (in a full lab report you would set up your ideas for why it might go either way).

Effect of gravity – "We demonstrate the action of gravity on blood pressure. As vertebrates possess a closed circulatory system, vertical height should contribute to blood pressure in predictable ways."

Dive response – "When diving, peripheral circulation should be reorganized to reduce cardiac output and increase peripheral vasoconstriction, called the dive response. We aim to observe the dive response by measuring _____."

Stimulus for dive response – "We will test potential triggers for the dive response including _____." "

(2) Concept check: demonstrate your understanding

> **How will we evaluate the hypotheses?**
>
> *What do you expect to see in the data if the hypothesis is true (if these mechanisms are occurring)? Be specific and relate back to observable parameters: (and relate to controls or confounding parameters, if appropriate).* Write a brief sentence for each (just for clarification, this is not a formal "section" of a scientific paper nor a lab report, rather these ideas would be woven throughout the manuscript):
>
> - Distance from heart

- Effect of gravity
- Dive response
- Stimulus for dive response

(3) Mini Results

*Display your results by including either **a figure or a table** for each important result (remember to design each to address a hypothesis).* You may work together with your group to produce the figures or tables. **Write a paragraph** for the results with *~**one sentence** pointing out what your data actually shows for each display item (refer in-text to each figure).*

(4) Mini Discussion:

Wrap-up: In paragraph form, briefly **Discuss** the **main take-aways** that you learned from these experiments on peripheral circulation and the dive response. Use specific results that back up your statements or speculate on the significance of the results. Organize by hypotheses above.

Individual assignment. Text must be your own, but you may work together with your group to produce figures/tables. You may edit this sheet. Submit by hard copy next week.