

Lab #5 IWS: Physiology of the in situ Amphibian Heart

Individual assignment. *Text must be your own, but you may work together with your group to produce figures/tables.*

Instructions: You may download and edit the .docx version. Your IWS captures the **intellectual content** of a full lab report but in skeleton form. Please get straight to the point. Include: (1) Statements of Purpose, (2) Concept Check, (3) Results, and (4) and Discussion. If you feel uncomfortable leaving out the methods, add a brief Methods section before Results (optional).

(1) Use these statements of purpose to frame your thinking about this lab. *Study the examples below, and fill in the blanks in a similar style and information content identifying parameters involved in the physiological mechanisms:*

Response to temperature _____

Response to stretch -- *We demonstrate the action of Starlings Law on the toad heart which predicts that the energy of cardiac contractions are proportional to the initial length of the cardiac muscle fibers.*

Responses to neurotransmitters and drugs -- *Although the toad heart has a myogenic pacemaker, cardiac performance can be modulated by the Central Nervous System via hormones and other chemical messengers. We demonstrate the action of potential excitatory and inhibitory messengers on cardiac performance.*

Responses to ion concentrations -- *Cardiac muscle contraction should be initiated by action potentials resulting from depolarization of cardiac muscle cells. By changing the _____ we should be able to demonstrate _____.*

Refractory period of cardiac muscle _____

Heart block _____

(2) Concept Check: For each experiment, ***in one sentence*** indicate **what would you expect to see in your data if the hypothesis is true.** Specify the observable parameters involved, and the expected change (e.g., relative to the baseline, control, or between treatments, as appropriate):

Response to temperature

Response to stretch

Responses to neurotransmitters and drugs

Responses to ion concentrations

Refractory period of cardiac muscle

Heart block

(3) Results: Include either a figure or a table for each important result that addresses the hypotheses. **Write a sentence pointing out** what trends are shown in each display item (you may put these together into a paragraph). Follow the lab report guidelines: Don't forget figure captions, which are different than the paragraph text, and NO RAW DATA.

(4) Discussion: In paragraph form, **briefly discuss** the **main take-aways** that you learned from these experiments. Start by summarizing the main results. Then discuss. Use specific results that back up your statements or speculate on the significance of the results. Organize by hypotheses above. You can see the guidelines for the full lab report if you wish.