Guide to the Laboratory/Discussion Report

In this class, you are required to complete a report for every laboratory and/or discussion exercise. The following is a recommended format, which will help you organize your thinking and writing. This guide does not apply to the formal laboratory report that you also need to complete. See the Guide to the Formal Laboratory Report. Unless otherwise indicated, the reports are due exactly one week from the completion date of the exercise.

You must know that the most important factor in writing a successful laboratory report is careful observation in the laboratory. The power of observation is often not stressed in modern curricula. But, please keep in mind that it is only through careful and critical observation that science (or any discipline for that matter) progresses. For this reason, you must come prepared to the laboratory and be ready to make careful observations when performing the experiments. The observations should be immediately recorded in your laboratory notebook. Maintaining a laboratory notebook is essential to good science and mandatory if you happen to work for a pharmaceutical or biotechnology firm. Do not postpone recording your observations until you get home. You will not remember all the important details. Therefore, the first step to a successful laboratory report is careful recording of your observations during the laboratory exercise. The recommended format of the laboratory report is as follows:

I. First Paragraph
   1. A very brief introduction to the laboratory/discussion exercise is necessary. In one to three sentences, indicate what was done and why it was done. This is important for establishing the importance of the scientific exercise. It is also important for placing every thing that follows within a meaningful context. This is not the place to mention specific experiments. This is the place to mention in broad terms what was done. For example, you would say: “The frog (Rana catesbeiana) sciatic nerve was used to study extracellularly-recorded action potentials.”
   2. Continue this paragraph with a very brief description of how the exercise was done. This description should not have more than three to four sentences in it. This is only to allow the reader to have a rough idea of how the exercise was carried out. The details are not important in a report such as this. In the formal laboratory report, you need to include the details of the experimental manipulations. But this is not necessary here. This is still not the place for details of the individual experiments. For example, you would say: “The sciatic nerve was gently dissected and placed in a nerve chamber for subsequent electrophysiological recording.” Continue the description with any additional necessary details.

II. Second Paragraph, Third Paragraph, Fourth Paragraph…
   In this part of the report, you will report either in chronological or logical order the specific experiments. Each experiment deserves its own paragraph. Each paragraph should contain the following information.

   1. This is where you describe the specific experiments. State specifically (and briefly) what experiment was done. For example, you may say: “In order to examine the effect of
temperature on the action potential conduction velocity, the velocity was measured at two different temperatures.” Include any additional details that you think are necessary. An alternative way to start this paragraph is to state the hypothesis that is being tested, followed by a brief statement of how it was done.

2. You then report the results that were obtained. If your results involved the measurement of some physiological parameter, the **numbers** must be reported. In many cases, it may be necessary to do some **data reduction**. Sometimes it is better to report the mean values as opposed to the individual raw recordings. In other cases, it may be necessary to report changes from the control value. In these situations you might consider reporting percentage changes. In some cases, it may be necessary to reduce the data to a graph. In any case, if you made measurements, it is important to report those numbers. In some cases, your observations may be qualitative. In these situations, you would describe the observations as accurately as possible.

3. Immediately following the reporting of the results, you should discuss the results. This means that you should interpret the results. This is where you need to explain what the results mean, and how they fit into the larger context of physiological knowledge. Your frame of reference should be the material that has been presented to you both in lecture and in the lab. For example, what does it mean when a reduction in temperature reduces the action potential conduction velocity? In addition, you should state whether your results agree with the accepted values. If they do not, why not? What are the potential sources of error?

The purpose of this recommended format is to compartmentalize your thinking in order to focus your attention on the details of the individual experiments. If you feel that an experiment was too short to deserve a full paragraph, you should find a good transition sentence in the paragraph linking one experiment to another one. Common sense should be your rule of thumb. If your writing can be read with ease; that is if it flows well, then it is fine. Otherwise you need to revise it.

**III. Last Paragraph**

In one to four sentences, summarize what has been learned. This is where you state in general terms what you have learned from this exercise. The details are not important here. State how this exercise has enhanced your knowledge about the function of the biological system under study. This is to force you to think why this exercise was important. For example you may say something like this: “Extracellularly-recoed action potentials provide an important means by which the general properties of action potentials are investigated.” You may then go on to mention the important conclusions of the exercise.

**So remember the following:**

1. What, why, how?
2. Specific experiments: Numbers, graphs, observations, and interpretations.
3. Conclusion(s).
**Other Points of Importance:**

1. Always, include your name and the name of your laboratory instructor on your report.
2. Include a title for the report. The title can simply be taken from the laboratory manual.
   Or if you wish, you can be creative and think of a better one.
3. The report should be typed and single-spaced. Please use a reader-friendly font at a readable font size. For example, 12 pt., Times New Roman is a good all-around choice. Some people like to use a san serif font (such as Arial or Helvetica) for the title. You may do this if you wish.
4. Scientific names should be italicized. For example, *Rana pipiens*.
5. Your writing should be as formal as possible, but without appearing pretentious. For example, use “did not” instead of “didn’t”.
6. Please spell check, and proofread at least two times. If you have not read your report at least two times before turning it in, chances are very good that your report will contain spelling, grammatical, and/or other organizational problems. Please try to avoid this.