

## BIOL115- Dr. Paul Zwiers, Instructor

### Writing lab reports

#### First a few notes:

- Be sure to include a title, your name, and class. The work is to be your own. You can review the lab and compare notes with another student, you cannot write your lab report with another student. Plagiarism will not be tolerated!
- Review your lab manual and results before writing this. This report will be much easier to write if you first understand the concepts of the lab and what you did.
- Write your lab report, then, take it along with this sheet to the writing center (FH114C). They won't write your lab report for you, but they can help you organize your thoughts and clarify your writing, probably earning you additional points.
- Refer to the example lab report (on tadpoles) if you get stuck and don't know how a section should read.
- Include all of the following sections in your lab report, in the order in which they are included here.
- Document format: Font- Arial, Size 12pt.; 1 inch margins all around; double space with only 1 additional return between sections.

#### Lab report sections and descriptions:

##### **Abstract:**

This should be a summary of your lab report. It should contain a brief description of the purpose of the lab, the methods you followed, the results, and conclusion. In all, the abstract should be 10 sentences or less. While the abstract is the first section of the lab report, it should be the last one written because it is a summary of your whole report.

##### **Introduction:**

This section states and explains the purpose of the lab. In this section you need to include background information to explain what you are investigating. This background information must be gathered from at least 3 different reputable sources, and cited within the paragraph (see below). You must clearly state your hypotheses and predictions (no, these are not the same). You also need to provide justification for your hypotheses, i.e. explain what, from the background information, led you to make these hypotheses and predictions.

Do the following when citing information from another source (book, journal, etc.). Paraphrase the information you want to include (quotations pulled word-for-word from a source is not appropriate, is considered plagiarism in this course, and should not be used). Paraphrase does not mean change just a few words (in this course, this would also be considered plagiarism). Instead, rebuild the sentence using your own words and you'll be safe. Immediately after the words in the sentence but before the period, use parentheses to include the author(s) last name(s), a comma, and then the year of the

publication. For example (quotations here are used just to identify this as part of a written manuscript within this document, you should not use direct quotations!)...

“Three species of birds are recognized within the genus *Sericulus* when only morphological characters are considered (Lack, 1969), but when molecular evidence is considered, four species of birds are recognized (Zwiers et al., 2008).”

If there is only one author, use his/her last name and year, e.g. (Lack, 1969). If there are two authors, do the following (Odeen & Hastad, 2009). If there are three or more authors use the first author's last name and “et al.” which means “and everyone else”, e.g. (Zwiers et al. 2008).

### **Materials and methods:**

The purpose of this section is to relay what you did so that others could repeat your experiment. This section can be tricky because it is very easy to unintentionally plagiarize (there are only so many ways to so “we added x mL of y”.) The best way to write this section is to make a list of everything you did (follow what you did in your lab book) but not in complete sentences. Then close your book and make complete sentences from your list. Such as:

#### List

Add 2 mL of solution X

Add 2 mL of solution Y

Mix with glass stir bar

Put in hot water bath, 5 minutes

“I mixed 2 mL of both solution x and solution y using a glass stir bar until combined. I then placed the tube in a hot water bath for 5 minutes.”

Do not give me a bulleted list of what you did. Also, be very careful not to give step-by-step instructions as if you were writing a recipe e.g. “Get a clean test tube and mix 2 mL of solutions X and Y...”. Please use past tense within the methods section. You are reporting what you've already done. It is easy to go overboard with information in this section. You can assume that people who would repeat your experiment have basic laboratory knowledge, meaning, for instance, they should know to get a clean test tube before mixing solutions X and Y. What you need to relay though, are the details that must be followed (like using 2 mL of each solution X and Y). Lastly, other instructors may want you to use passive voice, e.g. “this was done”. I'd rather you use active voice, e.g. “I did this”.

### **Results:**

Keep this section plain and simple. All you do in the results is state what you found. DO NOT interpret your findings here. Just say what you found for each test that you ran. Be sure to refer to the specific tables and/or figures in which you document your results, and which you will include at the end of your lab report (see figures/table section below). For example...

“Sugars were broken down more quickly by yeast A than by yeast B (table 1).

**Discussion:**

Here is where you interpret your results. Start off by restating your hypotheses. You can also remind the reader of your predictions. Next, explain your results and state whether they followed your predictions. Then you need to discuss the limitations of your experiment. Were there other issues that should have been taken into consideration? Are there other reasonable ways in which the results could be explained? What other questions do these results lead to you consider? If you restate background information, be sure to cite it again, and in the same manner as in the introduction.

**Literature cited:**

A reputable source is a journal article, published book, textbook, lab manual, or website with documentation of its association to a scientific organization or university (i.e. Dictionary.com and Wikipedia do not count). List, in alphabetical order by first author's last name, the literature you have cited in your report. Follow the format for your textbook and lab manual below (notice indentation of second line):

“Freeman, S. 2011. Biological Science, 4<sup>th</sup> ed. Pearson: San Francisco.

Barbeau, T, et al. 2012. Introduction to Biological Science Laboratory. Francis Marion University, Florence SC.”

**Figures and tables:**

Figures and tables are to be included at the end of the manuscript, labeled appropriately as Table 1, Table 2, etc. or Figure 1, Figure 2, etc., and given a brief description (see the sample lab report on tadpoles). You do not need both tables and figures containing the same information, but some information is more easily understood in one format versus the other. Refer to the tables and/or figures in the results section of the manuscript. Do not include excess tables or figures, only those that you refer to in the results section. Use Microsoft excel or Prism (both programs are available on university computers) to construct your tables and figures. If you don't know how to use excel or Prism give it a shot first. Then come and show me what you made and I can help you polish it.