

## Journal Format Lab Reports

Journal format lab reports must be type-written (with at least 1.5 line spacing) and graphs should be done using a spreadsheet program that will allow you to insert trendlines and derive equations for trendlines as necessary. When writing the reports, remember that you are writing for an intelligent reader who is familiar with biochemistry and the techniques used in typical lab experiments, but who has not performed the actual experiment on which you are reporting.

- I. Title
- II. Abstract – one paragraph of no more than ~300 words. The abstract should be a stand-alone summary of the report. It should include what has been accomplished and the significance of the work.
  - a. Statement(s) of the question(s) being answered.
  - b. 1-2 sentences on the system being studied (if relevant).
  - c. Statements of the techniques being used to carry out the experiment and assay the results.
  - d. Statement(s) of the specific results obtained (e.g. Hemoglobin and chromate were successfully chromatographically separated and recovered from the column in 87% and 65% yield, respectively). All quantitative results should appear with the corresponding units and should be rounded to the appropriate number of significant figures.
- III. Introduction – This section should be written in the present tense and should include a summary of the objectives of the experiment, a justification for doing the experiment and a summary of the approach taken. The intro must touch on background information from all major relevant areas bearing on the experiment. "Relevant areas" will include background on relevant aspects of the enzyme on which the experiment being run, background on any separation or purification techniques being implemented to prepare the sample and any assay techniques used to quantitate results. Cite references whenever appropriate.
- IV. Materials and Methods – This section should be written in the past tense and must not be copied verbatim from the lab manual nor duplicated from another student's lab report. Do not make a list of all reagents and equipment and do not "reproduce" the tables of the lab manual. Outline in sentence form the procedures you used, together with reagents and equipment, so that an intelligent biochemist could reconstruct the details by thinking about what you wrote. Do not give details about volumes of each component, instead give the final volume for the reaction along with the final concentrations of each of the components. It should be sufficiently detailed that someone else would be able to reproduce the results. Use subtitles to separate each method described. Do not put any results in this section.
- V. Results – This section should present (in text format) what you have found and what it means. It should be written in the past tense; report only your findings from the collected data. Readers are most interested in what you found out, not the gory details of how you found it out (which is the purpose of the Materials and Methods section and the Appendix). Make sure you write this in prose even though, to an extent, you are usually going to be going down a "list" of things in the lab manual. It is fine if answers are short and to-the-point, but they MUST be complete sentences.

Present the "final" calculation results, along with any graphs and tables. Graphs and tables should be inserted directly into the text, not stapled to the back of the report. Graphs and tables should be numbered and should be referred to in the text, i.e. "Figure 1 shows....". All quantitative results should appear with the corresponding units and should be rounded to the appropriate number of significant figures.

- VI. Discussion – This section should state the significance of having done the work, and importantly, did you answer the questions posed in the Introduction. Always begin with a few general statements summarizing the experiment and its findings and address how well your data answered the questions posed in the Introduction. Then focus on the questions asked in the lab manual. Frequently this section deals with "sources of error". When asked to respond about potential sources of error do not answer by divulging all the mistakes that were made while executing the experiment. The purpose of evaluating the sources of error is to think about which steps of the experiment were limiting the accuracy of the results in a manner over which you had no control. Hence, describe which laboratory manipulations were inherently inaccurate or problematic. Include a summary statement at the end (i.e., a short paragraph of conclusion(s))
- VII. Acknowledgements – Typically you will thank your lab partners. Write a complete sentence instead of just listing their names.
- VIII. References – List in the order of citation in the text. Use style and formatting described during the library assignment.
- IX. Appendices – You must include in a neat and organized fashion: 1) sample calculations for all experiments and 2) answers to questions that appear at the end of the experiment. Don't forget to include the correct units corresponding to the numbers. It is NEVER necessary to type the appendices, just make them neat and organized.
- X. A Note Regarding Formatting: subscript and superscript things as necessary (i.e. "1 x 10<sup>2</sup>" not "1 x 10-2" or "1E2" and "CrO<sub>4</sub><sup>2-</sup>" not "CrO42-". For numerical data use "scientific notation" for all numbers including those in graphs, (i.e. 1 x 10<sup>2</sup>), rather than "excel" or "engineering" notation (i.e. 1E2).