# MAINTAINING A LAB NOTEBOOK

The goal of a lab notebook is to allow researchers in the future to gain a clear picture of what you did. Any researcher with only a basic knowledge of common laboratory techniques should be able to reproduce your results from your notebook. This section contains guidelines for keeping a lab notebook. A good notebook can help you for the rest of your research career (you often need to reproduce your own results) and can save you money (notebooks are used as evidence when granting patents). Following these guidelines will also help you do well in this course.

Two-thirds of your grade will be based on your lab performance and notebook. You will turn in the carbon-copy pages from your lab notebook for every other class period at the beginning of the following class period. You and your partner will be on different schedules to ensure that we get pages from every group for each day. We will make comments on your pages and grade them on a scale of 1 to 5. Your final grade will depend on your average grade and improvement throughout the course. Finally, just because we will not collect your notebook for a certain day, does not mean you are off the hook. It is important that you continuously maintain your notebook to facilitate discussions. Furthermore, we might come by and ask you to see your notebook.

**Guidelines:**

1. The notebook should be written during class time and not afterwards. We are only having you turn them in at the beginning of the next class period because you might need to make some post-lab calculations or want to write a short (1-3 sentence) conclusion. Do not "pretty them up" for us. If a table or a short section is extremely illegible, messy, or awkwardly written it is ok to recopy it. Circle the section and write recopied below (or on page ##). You can also summarize a section if you think it adds needed clarity. For example, "the above section describes fine tuning the alignment.; it was a reiterative process."
2. Include everything in your notebook. Never use separate scraps of paper.
3. Write legibly in pen (no erasures or whiteout). Draw a line through any mistakes.
4. Put the date and title of the experiment at the top of each page; write "continued from p. ##" if continuing.
5. Include a signature and date at bottom and X-out blank space. Print your name on the first page when you hand in pages if your signature is illegible.
6. Include a short summary of what you're trying to do and why; 1-3 sentences are usually enough.
7. Include a detailed description of steps of experiment and observations. This will be the bulk of your notebook.
    - When making buffers, document every step and include weight, moles, volume, concentration, type of container, etc.
    - Use the appropriate number of figures. For example, if your measurement of volume or mass is limited to 2 significant digits the concentration should be written as 0.55 mol not 0.5521352 mol.
    - List sources of chemicals (sigma lot 5555). If you don't know ask.
    - List equipment (Shimadzu Bio-Spec Mini).
    - If following a written protocol, you do not need to recopy it; give a reference to it. (SDS-PAGE gel run as described in Chem 184 Reader, 2008, Appendix 2)
    - If repeating something detailed on another page, refer back to it (DNA isolated exactly as described on p.011).

- Note your observations of what you saw (the supernatant was brown, viscosity low).
- Draw pictures.
- Tape a copy of instrument data into the notebook.
- If there are computer files associated with your data clearly state the file name, folder, and program in your notebook.

8. Be aware of verb tenses. The section describing what you **did** should be in the past tense. "We ran the column at 3 ml/min to equilibrate it." Avoid the passive voice. Wording such as "the column is equilibrated" leaves us confused as to whether you **plan to** equilibrate or **did** equilibrate.
9. It is OK to write the protocol out before lab. Many students find this helpful. Make sure this is in the future tense and label the section as a protocol. Making a box around can help clearly differentiating it from observations written during the lab. If you do this, you can later simple write "followed protocol above exactly except for ……" Again the goal is to make it clear what you **planned to do** vs. **what you did.**
10. Include a conclusion (~2-4 sentences) at the end of each experiment. This will be extremely helpful when discussing your work with others.
    - What have you learned from the experiment?
    - Was anything tricky?
    - Note your suggestions for the future - how to improve expt., what to try next