

## Guidelines for Laboratory Notebooks

One of the most important skills you can develop as a scientist is keeping an excellent laboratory notebook. In the Dahlquist Lab, you will be performing original research. You are provided with a bound, laboratory notebook to use while performing research in this lab. Your laboratory notebook is a legal record of the experiments that you have performed. It belongs to me and should not leave the laboratory at any time. Use the following guidelines.

- Your laboratory notebook is a permanent record of everything you do in the lab. The record of every experiment should contain:
  1. Brief title of the experiment
  2. Brief statement of the purpose of the experiment
  3. Complete description of the experiment, including step-by step procedures and protocols, all data, and interpretations and conclusions drawn from the data (see details below).
  
- You are provided with a bound, laboratory notebook containing features to support this permanent record. Each page in the notebook has already been numbered, you need to fill in the following:
  1. Complete date, including the month, day, and year.
  2. Brief title of the experiment
  3. “From Page No.\_\_\_\_” and “To Page No.\_\_\_\_” for experiments that span multiple pages in the notebook.
  4. Fill in the Table of Contents at the beginning of the book as you go along with the title, date, and page number of the experiments performed.
  
- Use an ink pen to fill in your notebook, not pencil. Cross out mistakes with a single line, do not use white-out. Do not leave any blank spaces, completely fill in each page as you go. Never remove pages from the notebook.
  
- **Procedures.** The protocols need to be written out in enough detail so that you or someone else can repeat the experiment exactly using only the information in the lab notebook. Your first task when you enter the lab each day is to write out the protocol in your notebook **BEFORE** beginning any lab work. During the experiment, check off each step as you go, noting any deviations from the procedure by neatly crossing off what you didn't do, and adding any necessary details, especially:
  - Incubation temperature, location, and length, including the starting and ending time for any incubation longer than 5 minutes.
  - Centrifuge model, speed, temperature, and length of the spin.
  - Percentage of agarose gel, length of electrophoresis run, voltage, and the contents of each lane (a diagram of the gel is useful).
  - Final concentrations or amounts of all components in a reaction or growth media.

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- **Calculations.** Write out all necessary calculations in your notebook, not just the result. At a minimum, show the formula, the numbers plugged into the formula, and then the result of the calculation.
- **Data.** Everything that happens or doesn't happen is data. Record all observations and data as you go. Tape pictures of gels and other print-outs directly into your notebook. For gels, label the contents of each lane, identify each band in the lane, and label the marker bands with their sizes.
- **Tables and Graphs.** Make tables and graphs directly in your notebook, labeling the columns, rows, or X and Y axes as appropriate.
- **Proper Numerical Notation.** All numbers are represented correctly as follows:
  - Use leading zeros for all decimal numbers.  
For example, write "0.15", not ".15"
  - Use the correct number of significant digits for all measured and calculated quantities.
  - Provide the correct metric units for each number.
  - Use proper scientific notation, if necessary.
- **Summary.** At the end of each day, briefly summarize your results giving your interpretations of and conclusions from the data. Do not leave the lab until you have recorded all of your data and made your summary and interpretation.
- Do **NOT** modify prior entries at a later date. If data were omitted, the new data can be entered under a new date and cross-referenced to the previous entry.
- Record the contents and location of all materials that will be stored and used later (freezer, refrigerator, on bench at room temperature, etc.)
- Record the names and location of all computer files. Record all steps and manipulations you perform on your electronic data files. Back up your computer files; blank CDs are provided in the lab.
- When in doubt, include the information in your notebook.

These guidelines were adapted from:

Barker, K. (1998) *At the Bench: A Laboratory Navigator*. Cold Spring Harbor, New York: Cold Spring Harbor Laboratory Press, pp. 89-99.

Barker, K. (2002) *At the Helm: A Laboratory Navigator*. Cold Spring Harbor, New York: Cold Spring Harbor Laboratory Press, pp. 192-196.