

Delaney Laboratory

Guidelines & Policies

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1. Laboratory Safety

A. All safety training is coordinated through Traincaster; email the departmental coordinator, Sheila Quigley, to arrange training (sheila_quigley@brown.edu). To work in the laboratory you must complete (1) Laboratory Safety Training, (2) Hazardous Waste Training, and (3) Radiation Safety Training.

B. Before beginning work in the laboratory you must meet with the lab's Safety Officer, Dan Jarem, in order to review lab-specific safety measures. Also, please familiarize yourself with the Environmental Health & Safety manual available in the laboratory and, in particular, the Standard Operating Procedures in section 3 of the manual (you must sign this section before beginning work in the laboratory).

C. You must wear safety goggles when you are in the laboratory.

D. Be aware of the location of the laboratory's eyewashes, showers, fire extinguishers (and what type of fire they can be used to extinguish), first aid kit, and spill kit.

E. Absolutely no food or drink in the laboratory.

2. Ethics

The laboratory has a zero-tolerance policy on cheating, plagiarism, and falsification of data.

3. Laboratory Notebooks

A. Use the standard notebooks available in the stockroom and do not remove any pages.

B. Do not remove your notebooks from the laboratory. Notebooks must remain in the laboratory at all times.

C. Label your notebooks with your initials and consecutive numbers. For example, ABC-1, ABC-2, etc.

D. Use non-erasable ink. If you make a mistake, draw a line through the error.

E. Write in your notebook before, during, and after each experiment. Do not wait until the next day or later.

F. Write the date on each page. Some experiments will have several dates along the page border.

G. Record every action and observation. The more detail you provide, the easier it will be for you or someone else to reproduce your work.

H. Save the first 5 pages of your notebook for a Table of Contents and update this section regularly (at least monthly).

I. Spectra and chromatograms (HPLC, UV-vis, etc.) should be taped into your notebook and the corresponding filenames noted. Alternatively, you can collect spectra and chromatograms in a 3-ring binder organized in a way such that any given spectra can be easily located by someone else. (To see a good example ask Dan Jarem.)

J. Everyone is responsible for backing up his or her own data files. Back up often!

4. Searching the Literature

A. Two useful programs are SciFinder Scholar (available through CIS) and PubMed (link available on laboratory website). Keep in mind that no search engine is perfect and you should be in the habit of using more than one to search the literature. Take time to explore these two programs and learn how to use them.

B. SciFinder Scholar allows you to search by author name, general topic, chemical structure, or molecular formula (it will even provide information on commercial availability). For any given search you can then refine the results by publication year, publication type (e.g., review article), co-author, etc.

5. Reading Journals

A. It is important to keep up on the current literature and particularly as it relates to your project. Reading the literature is critical not only to learn about your project but also to prepare for upcoming seminar speakers, cumulative exams, writing research proposals, writing your own manuscripts, and ultimately getting a job.

B. The following are journals that you should read on a regular basis (links are available on the laboratory website). Most journals make published articles available on the web prior to releasing the print version and you may find it useful to browse articles as they become available. For example, all ACS journals have "Articles ASAP" listed on the front page of their website from which you can access the abstract and full text. I also highly recommend that you sign up to receive this list via email.

Journal of the American Chemical Society – Biochemistry – Chemical Research in Toxicology – Journal of Biological Chemistry – ACS Chemical Biology – Nature Chemical Biology – Proceedings of the National Academy of Sciences – Science – Nature – Nucleic Acids Research – Angewandte Chemie – Chemical Reviews

C. Although you should dedicate several hours per week to reading the literature you cannot expect to read everything; read papers that are most interesting to you and most relevant to your and the group's research projects. No one has time to read the entire text of every article. Read the abstract and introduction and if something is interesting or unclear consult the text and figures for more details. Keep in mind when writing your own papers that these are the sections most people read.

6. Project Management

- A. One key to a successful PhD is to be proactive in the learning process. After discussing a research project with me, spend time reading the literature in order to familiarize yourself with background in the field.
- B. After familiarizing yourself with the relevant background, prepare a short outline of your first expected manuscript. List the background experiments relevant to the project and the experiments you wish to complete.
- C. At least every three months revisit this outline and evaluate your progress. It is not uncommon for the strategy to change mid-project.
- D. You may find yourself wanting to explore side projects. Please discuss these ideas with me before proceeding.
- E. End each day by compiling a “to do” list for the following day.

7. General Expectations

- A. I do not enforce set work hours for graduate students. You will be evaluated based on research productivity. If I am satisfied with the quantity and quality of research you are producing, I will not question the hours you are working.
- B. Rotation students should plan to work at least 20 hours per week in lab. Obviously, the more time you spend in lab the more you will be able to accomplish in a semester. At the end of the semester you will present a group meeting on your progress.
- C. Undergraduates registered for CHEM0970/0980 should plan to work 10-15 hours per week in lab.
- D. Show & Tell: Show & Tell meetings are held on Mondays in GC425; the time will depend on my teaching schedule. Please see the schedule posted on the lab website. At these meetings you will present your most recent data, an analysis of that data, and your next planned experiments. This is an informal presentation (no PowerPoint). You should also prepare a handout of your data and have copies for each member of the lab. Please provide me with a short written text to accompany the data that summarizes what you have accomplished, includes an analysis of the results, and the experiments you have planned for the coming week.
- E. Group Meetings: Each member of the laboratory is expected to give at least one formal group meeting presentation per semester. These meetings will alternate between research and literature presentations. Please discuss with me the content you plan to cover in each of your group meetings at least one week prior to the group meeting.

8. Preparation of Group Meetings

When preparing a group meeting you are charged with the task of presenting a body of work, be it either your own research or work presented in the literature, to the other members of the laboratory. Here are a few useful tips:

A. I find it is useful to include flow charts that describe your own experimental strategy, if it is a research group meeting, or that describe the general strategy of the literature work that you will present if it is a literature group meeting. This allows you to first present to the audience the overall theme of the presentation and then you can walk them through the specific aspects of the flow chart.

B. When presenting data you **MUST** walk the audience through all aspects of the data. Do not show a gel or a plot of data and expect the audience to properly interpret the data and come to the correct conclusion on their own. *If you show data you must describe the data!* For example, if you show a graph, start by first stating what the x and y-axes represent. If there are results from multiple samples being displayed on one graph you must describe each sample and the data obtained for each. In addition, always include a discussion of the controls because without the proper controls your data would be meaningless.

C. You should always practice delivering your presentation. Not only do you need to spend time creating slides but you also need to spend time preparing the words to accompany the slides.

D. A laser pointer can be a very helpful tool for delivering a presentation but it can also be a distraction. You should not direct the laser pointer at your slide and move it around randomly as you describe the slide. Rather, use the laser pointer to direct the audience's attention to a particular aspect of your slide as you discuss that aspect of the slide. *In essence, you need to show the audience where to look on the slide and then tell them how to interpret what they are looking at on the slide.*

E. Don't be afraid to repeat yourself. If a result or concept is very important, let the audience know that by stating the conclusion again using different words.

9. Preparation of Written Reports and Manuscripts

A. General points

- Spell check.
- Include page numbers and complete referencing.
- Have someone else (one of your lab mates or a colleague in another lab) read the draft and give you feedback - I should not be the first one to read it.
- Provide me with a printed copy and also email me a copy.

B. Preparing a manuscript

When preparing a manuscript you must first decide to which journal you will submit the manuscript. After discussing this decision with me, read the “instructions for authors” which is available on each journal’s website. You must prepare the manuscript according to these instructions and I expect all drafts of the manuscript to be properly formatted. I suggest preparing the manuscript in the following order:

1. Prepare all the figures for the manuscript. Once you have the figures prepared it will be significantly easier to write the results section. In addition to figures that include your experimental results I find it is often helpful to include an introductory figure that provides an overview of the experimental strategy. The figures should be created using the dimensions and format described in the “instructions for authors.” Please show me the figures before proceeding with writing the text of the manuscript.
2. Write the results section. For full papers, divide the results section into subsections and start each subsection with a heading that summarizes your analysis of the results described in the subsection. The results section should only describe the results of experiments and should not, for instance, provide an analysis of the results (this will be done in the discussion section). For an example of how to write up results please see a recent publication from the lab.
3. Write the discussion section. With the figures prepared and the results section written you can now discuss the results. This section should include an analysis of the results and a description of how they should be interpreted with respect to literature reports.

****Note:** Some journals have a combined “results and discussion” section in which these two sections are interwoven. Because of this fact it is important for you to decide to which journal you will submit the manuscript before you begin writing.

4. Write the introduction. Although you may be tempted to write this section first you will write a more appropriate and effective introduction if you write this section after completing both the results and discussion sections. In the introduction you must first establish what is already known in the field. However, you will have only a few sentences to do this so you must choose your words carefully. You must then establish a “gap in knowledge” or what remains unknown. *Importantly, your experiments and results should address this gap in knowledge.* For this reason it is easiest to write the introduction after you have described your results and discussed the implications of your findings. You should end the introduction with a very brief statement of your findings and their significance.
5. Write an abstract. This should be the last section that you write. It should contain aspects of introduction, results, and discussion. You should be aware that many people will only read the abstract so you want to ensure that the “big picture” that you want someone to walk away with from your manuscript is conveyed in the abstract.

6. Manuscripts should be named using the following format:

Initials_manuscript number_version

For example, the first version of the first manuscript that I write would be SD_1_1; subsequent versions would be SD_1_2, SD_1_3, etc. Save all drafts separately instead of overwriting one file with another.

10. Books Available in the Lab

A number of reference textbooks are available in the laboratory including *Biochemistry* (Voet & Voet; 3rd edition), *DNA Repair and Mutagenesis* (2nd edition), *Biophysical Chemistry* (3 volume set by C.R. Cantor & P.R. Schimmel), *Molecular Cloning: A Laboratory Manual* and *Current Protocols in Nucleic Acid Chemistry* (the last two are excellent collections of biochemical and molecular biology protocols). Browse through these books (Chapters 5, 6, 7, and 29 of *Biochemistry* provide a good introduction to various aspects of nucleic acids and DNA; Chapters 3, 6, 7, 8, 22, 23, and 24 of *Biophysical Chemistry* provide an analysis of the hydrogen bonding and base stacking that control DNA duplex formation, denaturation, and the experimental methods used to probe these chemical interactions). Please do not remove these books from the laboratory.

11. Instrument Training

Before using any instrument in the laboratory you must be properly trained by the lab member responsible for that piece of equipment; please consult the lab responsibility list to determine who is responsible for a given instrument.

12. Labeling and Storing Samples

A. Label all samples (including those being stored on your lab bench and in the refrigerator/freezer) with a descriptor of the contents and the notebook and page number on which the sample was generated and is described.

B. For long-term storage, please do not keep your samples in the plastic racks we use for active experiments but rather in the cardboard storage boxes available in the laboratory.

13. People and Phone Numbers to Know

Police, Fire & Medical Emergencies	4111
Environmental Health & Safety	3-3353
Facilities Management (general maintenance)	3-7850
Facilities Emergency (e.g. significant water leak)	3-7800
Radiation Safety Office (for waste pick up)	3-1738
Daniel Sarachick (Chemical Hygiene Officer)	3-1737
Rich Shea (Radiation Safety Officer)	3-3615
Chris Harwood (Biosafety Officer)	3-3087
Sheila Quigley (Department Coordinator; GC201)	3-9618

I have read these guidelines and procedures.

Signature:

Date:

Name (print):
