

Techniques in Molecular Genetics

Keeping Records and
Expectations

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Documentation

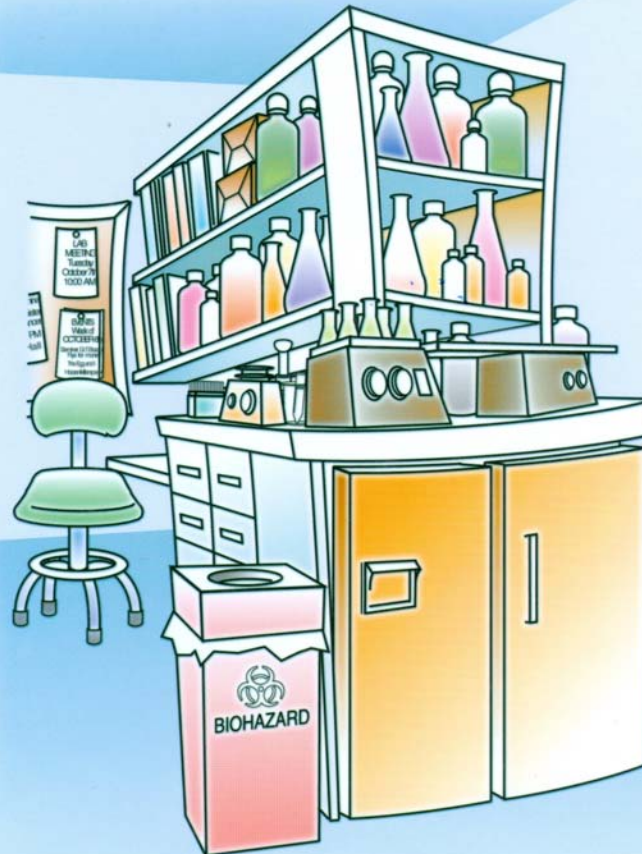
- keep a copy of all protocols
- must be able to document **primary** literature references
- must include details of all experiments
- must have original protocol and your own protocol that is sufficient to allow another person to reproduce the experiment

At the Bench

A LABORATORY NAVIGATOR

UPDATED EDITION

"...a marvelously crafted, enormously useful and entertaining guide for the laboratory neophyte...a survival kit no bench worker should be without."



Kathy Barker



COLD SPRING HARBOR LABORATORY PRESS

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General Lab Organization and Procedures

WELCOME TO ONE of the most exciting and enjoyable workplaces ever evolved, the biomedical research laboratory. There is an amazing concept in operation here: You get paid or get credit for doing experiments, surely an almost scandalously delightful way to make a living. The work is worthwhile. The dress code, if any, is casual. The work hours are often self-determined and based on the needs of the experiment. The lab or department is filled with bright and interesting people with whom you can discuss the salt concentration needed for a kinase assay or the implications of the latest congressional bill. It can come to have all the psychological comforts of home.

Like any complex social organizations, research laboratories have their own customs and rules. The difficulty is that the rules have been unspoken. You are expected to decipher the many obtuse clues and become a law-abiding member of a society in which individualism is highly prized. Although no one is expected to show you how to work the equipment, you will be expected to work it. In a profession in which communication of data is the goal and the reward of the research, not all people can communicate with you clearly and satisfactorily. Don't worry, you will manage! In a short time, the pleasure of working together with colleagues on interesting and similar projects will supplant any initial feelings of unease. But to get your work done well, you must first navigate among sometimes vague and mixed signals and learn how your laboratory beats and hums.

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Presentations

- Basic area - why is it of general interest?
- Background relevant observations
- Hypothesis being tested - make a clear statement
- Describe basic experimental approach including methodology and alternative methodology
- Present results - describe the results and compare, when appropriate, to your own work and to literature results

Dissemination of Results

before computers

- rough results presented first and results for publication drafted later

today

- publication can be made directly from raw data

This course...for the student provides:

- standardized instruction
- familiarity with departmental equipment
- appreciation for expectation of performance
- coupling of theoretical with practical training
- can concentrate on practical material without the distraction of other courses

For the professor...

- reduction in need for instruction
- increased productivity of student during the summer..

Supervisor Expectations...

- Read the literature
- Ask questions (be inquisitive..)
- Keep regular hours (at least until you publish a paper..)
- Give lab talks (with enthusiasm..)
- Produce final tables/figures
- Organize data—cross references to computer files
- Properly store samples (archival if necessary)
- Properly dispose of samples.
- ***Be Intellectually Engaged!!!!***

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Student Expectations...

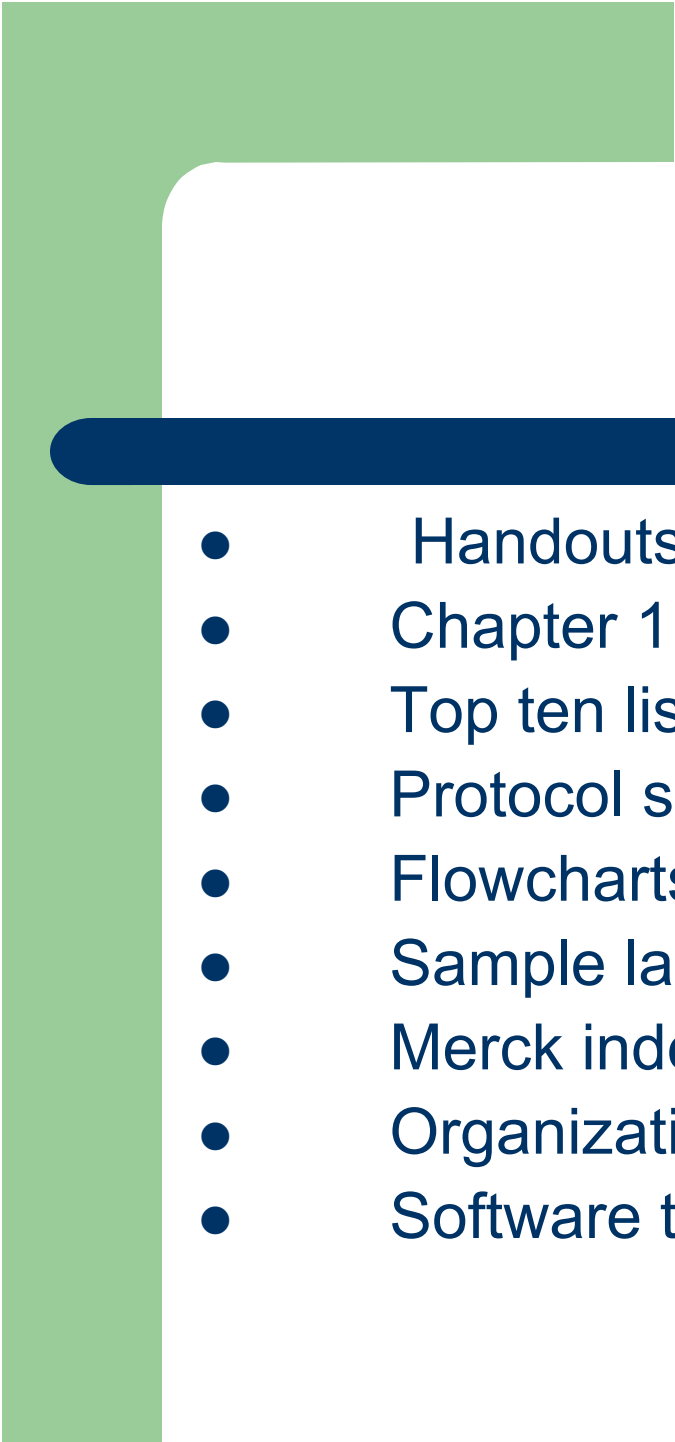

- Reference Letter
- Valuable Experience
- A Paycheck..

Materials

- My lab page Forsbergs lab
- At the bench
- Gilson Guide to Pipetting
- Protocol sheet
- Handouts

Thesis

- Use “Table of Contents” function in Word
- Use Reference Manager or equivalent (Refworks)
- Protocols (Standard Operating Procedure (SOP))
- Appendices (raw data)

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- Handouts
 - Chapter 1
 - Top ten list
 - Protocol sample
 - Flowcharts
 - Sample lab book
 - Merck index
 - Organization of data in spreadsheet
 - Software tools

Laboratory notebook

1. Title: e.g. Lab #1 - Microscopy and Examination of Living and Stained Cultures
2. Introduction: Briefly state why this experiment was conducted in your own words – do not copy the lab manual.
3. Objective: Briefly state what you are attempting to determine
4. Materials and Methods: If same as the manual then refer to the lab manual. If different from the manual state the differences. For your own understanding use flow charts to illustrate procedures.
5. Results: If possible, use table(s) and/or figure(s) to present raw data. **Provide brief descriptions of what the data mean.**
6. Discussion: Briefly discuss what you can conclude from your results. Sometimes experiments fail either because of an unanticipated variable or because of experimental error. If your results deviate from expectations, identify possible sources of error, provide alternative hypotheses, and suggest improvements for future experiments.
7. Questions: Briefly answer the questions given at the end of each lab.
8. Fill in the table of contents to permit easy orientation.
9. Sign and date each page. Signature of lab partners or advisors are waived here due to class size. However, this is an essential procedure in government and industry labs.
10. Answer the Lab Rotation questions on the pages indicated.