Biological Chemistry Laboratory
Biology 3515/Chemistry 3515
Spring 2023

Lecture 1: Introduction to Class

Tuesday, 10 January 2023

©David P. Goldenberg
University of Utah
goldenberg@biology.utah.edu

COVID Is Still Here (Along with Flu and RSV)!

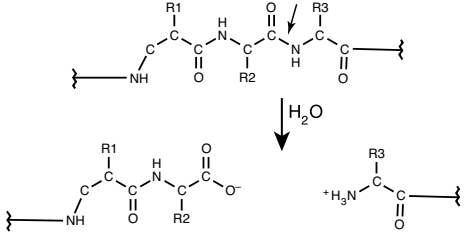
For your sake and others, please:

- Get vaccinated and boosted if you haven't already:
  https://alert.utah.edu/covid/vaccine/
- Consider wearing a face mask when indoors with others!
- Get tested regularly:
  New campus testing service is in the works.
- If you have COVID symptoms or a positive test result:
  - Do not come to class or work!
  - Notify your instructors and arrange for accommodations.
  - Complete the reporting form.
- For updates see:
  https://coronavirus.utah.edu

Biology 3515/Chemistry 3515

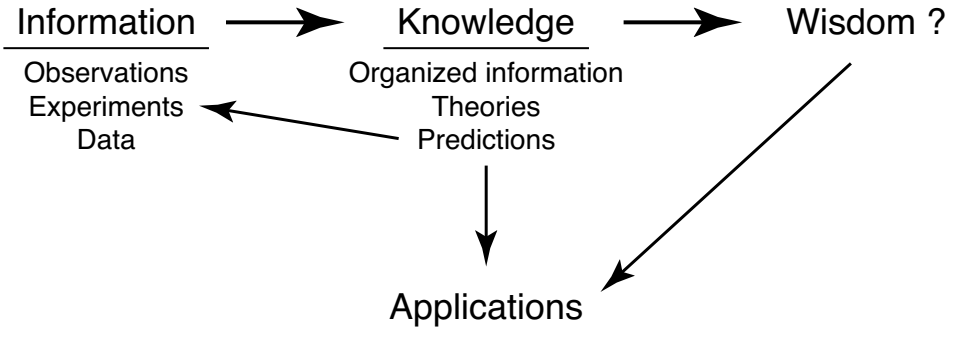
What is this course about?

- Title: Biological Chemistry Laboratory
  - More than just a lab course!
  - Biology (living organisms) $\longrightarrow$ Chemistry (molecules)
- Proteins and enzymes
- Proteases: Enzymes that hydrolyze proteins



- How do we know what we know (or think we know)?

How do we know? What do we do with it?



- All of this is sometimes messy!
- The data and their integrity are critical.

What else is this course about?

- Quantitative data and analysis
  - Acid base equilibria
  - Spectrophotometric measurements of concentration
  - Enzyme kinetics (reaction rates)
  - Curve fitting (matching experiment and theory)
- Molecular structure and modeling
- Separation methods
  - Electrophoresis
  - Chromatography
- The computer as a scientific tool

Course Mechanics: Instructors

- Instructor

  David P. Goldenberg
  306 Aline Skaggs Biology Building
  goldenberg@biology.utah.edu

  Office hours (starting second week of classes):

  - Tuesdays: 11:00 AM - noon
  - Wednesdays: 9:30 - 10:30 AM
  - Other times by appointment. (Send me an e-mail message!)

- Lab Instructor

  Adam C. Rupper
  Office: BLDG 044, Rm 220
  E-mail: adam.rupper@biology.utah.edu

Course Mechanics: Lectures, Lab sessions and TAs

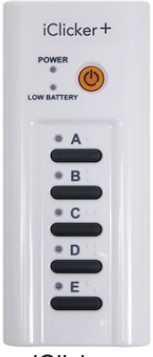
- Lectures:
  - Room 208, Crocker Science Center
  - Tuesday, 9:40–10:30 AM
  - Thursday, 9:40–10:30 AM
- Lab Sessions and TAs:
  - Room 143, Crocker Science Center
  - Monday - Calder Lake
  - Tuesday - Leon Guerra
  - Wednesday - Erik Smith
  - Thursday - Juli Kim

Lab sessions begin at 1:00 P.M. and **may** go until 5:00 PM.

Special Accommodations

- For disabilities: Contact the Center for Disabilities and Access
  https://disability.utah.edu/
- For COVID-related absences: Complete the form at
  https://www.biology.utah.edu/secure/covid-accommodations/
- For other illnesses, family emergencies, *etc.*: Contact the instructor
  goldenberg@biology.utah.edu
- For excused absences from lectures:
  - Lowest four clicker scores will be dropped for everyone.
  - If additional absences are unavoidable, further accommodations can be made.
- For excused absences from lab sessions:
  - Options will be provided to generate data for report.
- We will make it through the semester!

Clickers



iClicker+

iClicker 2

- iClicker+ and iClicker 2 devices are supported.
- iClicker app for mobile devices will not be supported for this class!
- iClicker+ is available at the Bookstore for $44.95, with 5 year license.
- Responses will count for 5% of total class grade.
- Have a calculator handy!
- Four lowest clicker scores will be dropped.
- Extra points for finding errors in the lab manual or lecture slides!

Electronic Etiquette Policy

- The use of cell phones, tablets or laptop computers will not be allowed during lectures or in the lab.
- Exceptions will be made for special accommodations.
- Cell phones may be used in cases of emergency.
- Please feel free to talk with me about any special problems this policy may create for you.

A Recommended Alternative to Electronic Screens

Photo courtesy of photos-public-domain.com

Backed by Scientific Research!

Research Article

aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

Psychological Science
2014, Vol. 25(6) 1159–1168

DOI: 10.1177/0956797614524581
pss.sagepub.com
SAGE

The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking

Pam A. Mueller[1] and Daniel M. Oppenheimer[2]
[1]Princeton University and [2]University of California, Los Angeles

http://dx.doi.org/10.1177/0956797614524581

An Occasional Response to the Electronic-device Policy

- Who is Goldenberg to tell me what is the best way to takes notes?

- It's not all about you!
  - The policy is meant to improve everyone's experience.
  - Everyone benefits if you are fully engaged during class.
  - Electronic devices are distracting to those around you!

Clicker Question #1

What is your major?

A) Biology

B) Chemistry

C) Biochemistry

D) Other

Clicker Question #2

Why are you taking this class?

A) A deep love of biochemistry

B) To satisfy a requirement for my major

C) For the chemistry minor

D) Other graduation requirement

Clicker Question #3

When do you expect to graduate?

A) Spring 2023

B) Fall 2023

C) Spring 2024

D) Fall 2024

E) Someday

Clicker Question #4

What do you hope to do after graduating?

A) Work in an area related to biochemistry

B) Work in an area unrelated to biochemistry

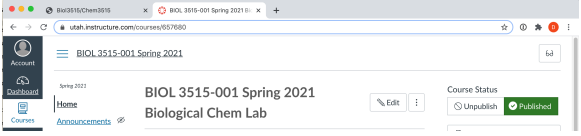
C) Go to graduate school

D) Go to medical school or other professional school

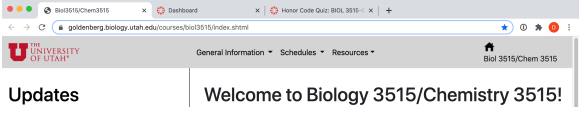
E) Something else entirely!

Biology 3515/Chemistry 3515 on the Web

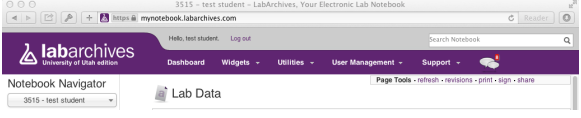
- Canvas: https://go.utah.edu/cas/login



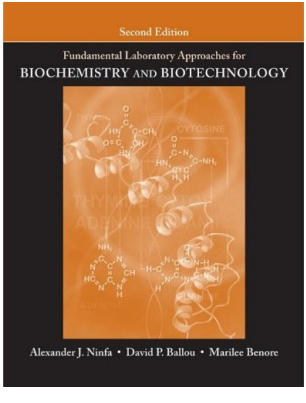
- Course web page:
  http://goldenberg.biology.utah.edu/courses/biol3515/index.shtml



- LabArchives: https://mynotebook.labarchives.com/login

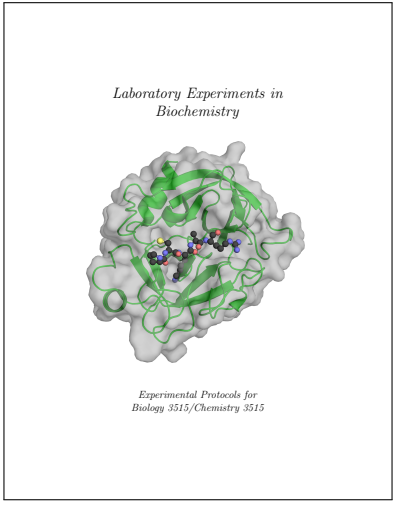


Suggested Text



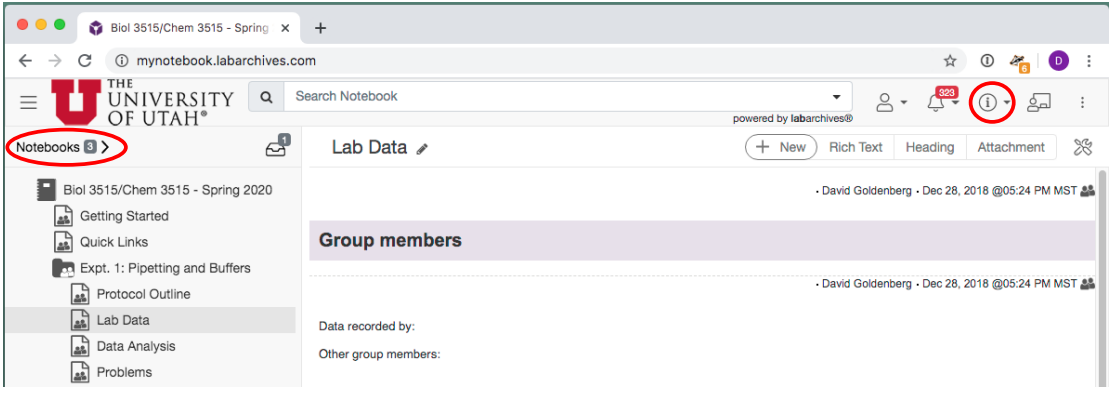
- Fundamental Laboratory Approaches for Biochemistry and Biotechnology, by Ninfa, Ballou and Benore
- Several copies are on reserve in the Marriott Library

Lab Manual



- Available in the bookstore.

LabArchives: An Electronic Laboratory Notebook



- Keep it organized!

Lab Reports: Prepared in LabArchives

- Before lab session (15% of report grade):
  - Protocol Outlines (“signed” before class)
- During lab - record of experiments (10 – 20% of report grade):
  - Measurements
  - Intermediate calculations
  - Deviations from lab manual protocols
  - Data files (uploaded to LabArchives and identified)
  - Record results of experiments that “don’t work!”
  - Signed at end of lab session

Lab Reports: Prepared in LabArchives

- Following lab session (40 – 65% of report grade):
  - Data analysis
    (20 – 50% of report grade)
  - Problems
    (20 – 50% of report grade)
  - Molecular modeling exercises
    (0 – 15% of report grade)
- *NOT* part of the report: Discussion or other literary forms.

Very Important!

- You will be working in groups of two or three in the laboratory, but each of you is responsible for writing your own reports.
- You may consult the instructor, the TAs or other students as you work.
- **The actual work handed in (other than the primary lab data) must be your own.**
  - **Any data analysis files, molecular modeling files, text or other material must be clearly distinguishable from that of other students.**
  - **Submitting work that is not your own will be considered plagiarism.**

Quizzes and Final Exam

- Quiz 1: Thursday, 9 February - 25 min, 25 points
- Quiz 2: Thursday, 23 March - 25 min, 25 points
- Final Exam: Monday, 1 May, 10:30–11:30 AM - 50 points, cumulative

Previous quizzes and exams are posted on Canvas.

Grades

- Grade components
  - Laboratory reports: 70%
  - Quizzes: 25%
  - In class responses (clickers): 5%
- *Maximum* cutoffs for determining class letter grades:

  A: 92–100% (including A-)

  B: 82–91% (including B- and B+)

  C: 70–81% (including C- and C+)

  D: 60–69%

  E: $<$ 60%

  These may be adjusted downwards!