Biochemistry II Discussion
BB 422/528/622
Spring 2026

Anthony Hushka, PhD
Biochemistry Lab Coordinator
Postdoctoral Associate Teaching Scholar

Discussion sections (1 h 15 m)
C1 Wed 12:50 – 2:05 pm **CAS 216**
C2 Thurs 12:30 – 1:15 pm **CAS 203**
C3 Thurs 3:30 – 4:45 pm **CAS 315**

Laboratory sections (4 h; SCI 427)
B1 Wed 5:00 – 9:00 pm
B2 Thurs 8:00 am –12:00 pm
B3 Friday 10:10 am – 2:10 pm
B4 Friday 3:35 – 7:35 pm
B5 Mon 5:00 – 9:00 pm

Office hours and contact info
Monday 3-4 pm in SCI 344
&
Friday 2-4 pm in SCI 270D
ahushka@bu.edu

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Biochemistry Discussion

Discussion will provide helpful notes to complete lab experiments and **lab write-ups** for each chapter. There will be an **in-class activity** during discussion, and this contributes to your **attendance**.

Quizzes will be given at the end of every discussion. Discussions are **mandatory** and held in-person.

A lab **comportment** grade is assigned throughout the semester (a mid-semester feedback will be given).

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Lab grade is composed of:

Lab grade component	Percentage
Laboratory write-ups	70%
Comportment	15%
Discussion attendance	5%
Discussion quizzes	10%

For 422 students – lab is 30% of course grade!

Outline of today's discussion

1. Lab syllabus
2. The laboratory manual
3. Your laboratory notebook
4. Chapter 7 concepts
5. Chapter 7 procedures
6. Chapter 7 checklist

Lab Syllabus: Requirements

Prerequisites

- CAS BI/CH 421; or equivalent
- First Year Writing Seminar (e.g., WR 100 or WR 120)

Questions, concerns, differences in opinion

- Questions: first go to your lab slack channel or office hours
- Grading questions: first go to lab TFs, then Gradescope
- I will try to answer e-mails within 24 hr (ahushka@bu.edu)
    - email is only for emergent or sensitive issues

Lab Syllabus: Requirements

Required materials

- Textbook:
  - *Biochemistry Lab Manual*, Tolan, Medrano & Low, 6th Edition (BU Bookstore)
- Lab Materials:
  - Safety goggles
  - A lab coat
  - A bound notebook
  - Scientific calculator
  - USB flash drive
  - Black or blue pens (**NO pencils or white-out!**)
- Slack App
  - For you to help each other!
  - Discussion amongst students in general chat
  - TFs will try their best to answer and help you – join your lab section

Lab Syllabus: Lab Safety

- Dress appropriately
  - Closed-toed shoes, long pants/legs covered, t-shirt, long hair tied back
  - **Safety eyewear & long lab coats** worn **at all times**
- No food, drink, or consumables of any kind
  - Water bottles should be hidden in backpacks or on table outside lab
- No application of cosmetics in lab
- All used plastics, sharps, and solid waste go in designated containers (read the signs)
- All hazardous chemicals disposed of appropriately (TFs will advise)
- Arrive to lab on time **(~5–10 min before start is best)**. Do not be late!

Repeat violations will result in dismissal for the day and will negatively impact your comportment grade.

Lab Rules

1. **Dispose of waste** in the correct containers
    a. Plastic consumables (barrels): pipette tips, conical tubes, eppendorf tubes
    b. Biohazard bin (red or yellow): serological pipettes *placed horizontally*
    c. Cardboard glass waste (blue and white): glass tubes, any broken glass (have TF clean)
    d. Liquid carboys (white): any liquid that does not need specialized waste, flammables go in red metal carboy

    do not overfill or try to stuff waste containers
2. Only use **equipment** at your bench, do not take from other benches even if they are empty
3. **Clean up** after yourself, including making sure your bench equipment has the correctly numbered label
4. If you take a reagent out of the fridge, please return it to the fridge.
5. Do not touch reagents or equipment that are not designated for your course.
6. If you are confused over anything (procedures, equipment, reagents, etc), please ask rather than guess!

Lab Syllabus: Schedule

Attendance at Labs and Discussions is mandatory!

Making up lab work

- Anticipated absences (e.g. jury duty, BU athletics, interviews)
  - Notify Dr. Hushka ASAP… at least a week of notice (**must be cleared by Dr. Hushka*)
- Sudden emergencies (e.g. illness, family death, hospitalization, accident)
  - Requires documentation
- Students can miss **up to two weeks** of Biochemistry labs without having any additional negative impact to their scores due to excusable circumstances
- Make-up labs or work will be provided so the post-lab report can be completed

Making up discussion work

- No make-up quizzes for discussion are available past the discussion date (unless sudden emergency with documentation)

If you anticipate missing a discussion, you must contact me more than a week in advance

Lab Syllabus: Grading

Laboratory Write-ups

- Pre-lab sections and all data collection/observations must be written in your laboratory notebooks in pen.
- Pre-lab and in-lab write-up templates will be provided in Gradescope every week. Post-lab will be available for each chapter. You will complete the templates in Gradescope, and we will grade your Gradescope submission.
- A **10% deduction penalty** will be applied for each day your write-up is turned in late (***every 24 hours from time due!**).

Lab Syllabus: Grading

Discussion Quizzes and Attendance

- Quizzes given at the end of each discussion section.
- Read introduction and procedure sections in lab manual to prepare for quizzes.
- In-class activity during discussion that will contribute to your attendance.

Comportment

- Attendance, punctuality, cleanliness, preparation, effort, laboratory skills, quality of experimentation, ability to work in a group, and adherence to safety regulations will all be factored into this evaluation throughout the semester.

Lab Syllabus: Academic Misconduct

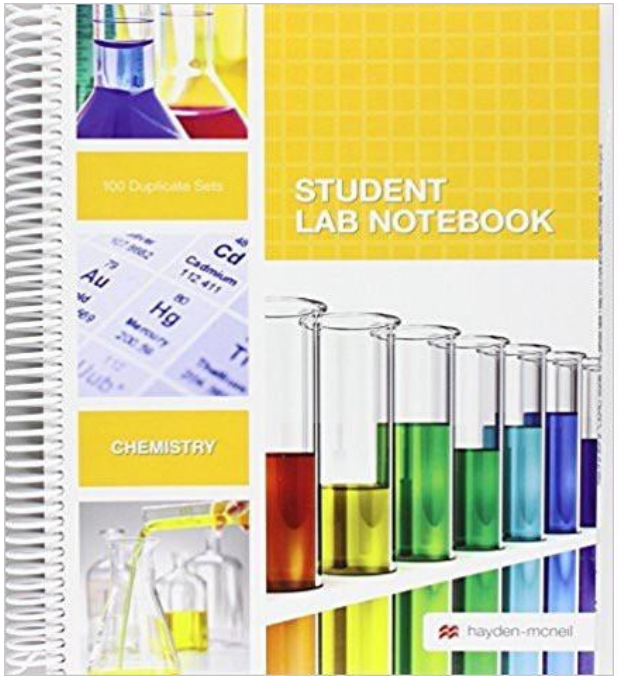
Examples of Violations in Academic Conduct

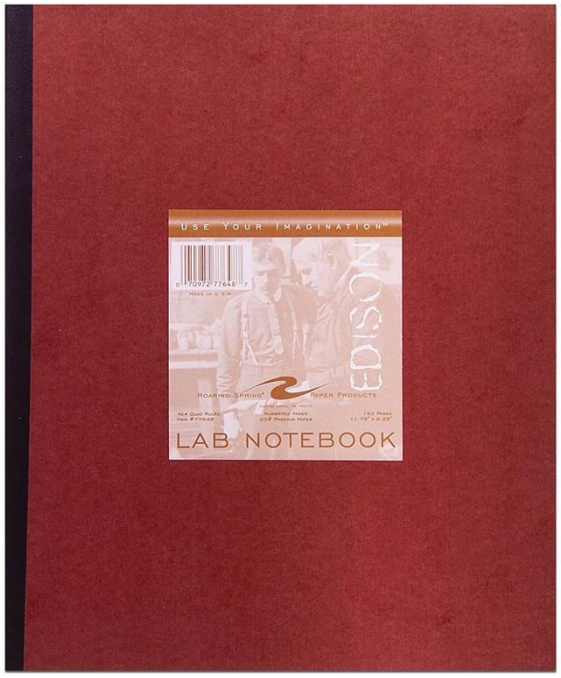
- Photocopying or copying from lab manual or discussion slides
- Copying from lab partner, current students, or previous students (any part of the notebook)
- Copying verbatim from lab manual (introduction and lab procedures)
- Using a table or graph created by your lab partner
- Copying off another student or using personal notes during a discussion quiz

Students are free to talk about data and experiments, **but required to work independently on all aspects of post-lab write-ups**

Your Laboratory Notebook

It is your responsibility to keep and maintain a professional notebook throughout the course!





- Black or blue pen **only**
  - ➢ Neatly strike through mistakes
  - ➢ **No white-out, no pencils**

Lab Syllabus: Pre-Lab Write-Ups

Complete by hand in your **Lab Notebook** every week ***before*** lab

Uploaded electronically to Gradescope 30 min before your lab

I. Title: detailed and descriptive

II. Purpose: one or two sentences describing the objectives of the experiment

III. Procedure and **flowcharts (if necessary)**:

- **In your own words** (**not verbatim from the manual**), write a protocol for the assays and experiments you will accomplish in the laboratory
- **Reagent list**
- **Prepopulated tables** for data collection
- **Prompts** for recording observations
- Equations needed for on-the-fly calculations ("plug and chug")
- Procedural flow charts should be your own creation and outline the experimental steps, the input and output of each step, and the experimental conditions

Preparation is key in this course!

Your notebook should contain…

For each experiment:

- **Title (pre-lab)**
- Note any **hazardous materials** that will be used **(pre-lab)**
- **Reagent list/table (pre-lab)**
- **Procedure** written out on the left hand side of page **(pre-lab)**
- **Data and observations** on the right hand side of page **(during lab)**
    - Recorded in the lab notebook while performing the experiment. Will be submitted as part of your in-lab submission due end of lab day.

Gradescope Pre-lab Assignment Modules

Q2 Purpose
2 Points

In 1-2 sentences, describe what the experiment entails and the objectives of the experiment.

Q3 Procedure - Pre-lab
4 Points

Prior to the laboratory, write out the experimental protocols for the experiments that you will conduct in the laboratory in your lab notebook, in your own words. The experimental protocols should also include tables of reagents that will be used in the experiment including, where appropriate, reagent molarities (for solutions), measured quantities (mass or volume), and number of moles. Tables that you will use for collecting data should also be prepared. Also be sure to include blank spaces in your procedure for the observations and measurements that you will make during the experiment.

Procedure to be written on the left hand side of the page while data and observations are on the right hand side of the page.

Create a pdf of your handwritten procedures and tables, and upload them below.

No files uploaded

Importing Images to GradeScope
Remember: We can't rotate the images!

Take a picture of the table in your notebook, and upload it below

27F5BE95-3A00-4C4F-9260-D50E19EC6229.jpeg Download

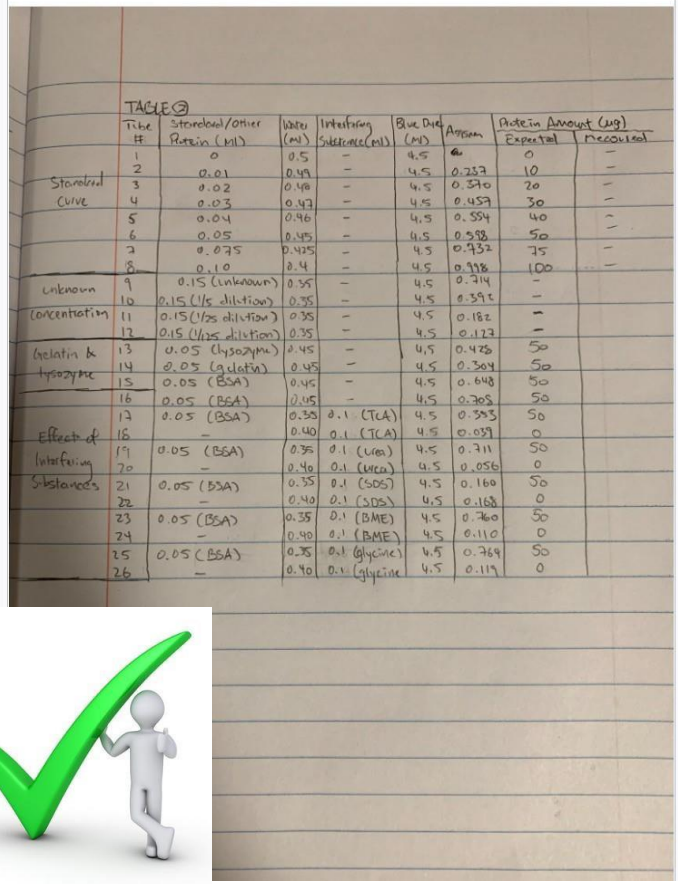


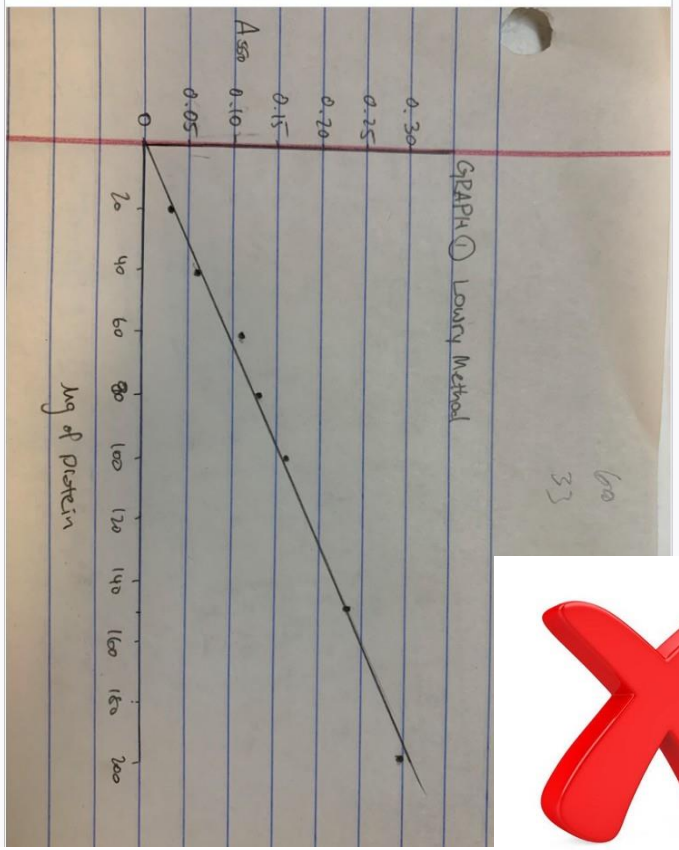
TABLE ③

	Tube #	Standard/Other Protein (ml)	Water (ml)	Interfering Substance (ml)	Blue Dye (ml)	Abs 595	Protein Amount (ug) Expected	Measured
Standard Curve	1	0	0.5	–	4.5		0	–
	2	0.01	0.49	–	4.5	0.257	10	–
	3	0.02	0.48	–	4.5	0.370	20	–
	4	0.03	0.47	–	4.5	0.459	30	–
	5	0.04	0.46	–	4.5	0.554	40	–
	6	0.05	0.45	–	4.5	0.598	50	–
	7	0.075	0.425	–	4.5	0.932	75	–
	8	0.10	0.4	–	4.5	0.998	100	–
Unknown Concentration	9	0.15 (unknown)	0.35	–	4.5	0.714	–	
	10	0.15 (1/5 dilution)	0.35	–	4.5	0.392	–	
	11	0.15 (1/25 dilution)	0.35	–	4.5	0.182	–	
	12	0.15 (1/125 dilution)	0.35	–	4.5	0.123	–	
Gelatin & Lysozyme	13	0.05 (lysozyme)	0.45	–	4.5	0.426	50	
	14	0.05 (gelatin)	0.45	–	4.5	0.304	50	
	15	0.05 (BSA)	0.45	–	4.5	0.648	50	
	16	0.05 (BSA)	0.45	–	4.5	0.705	50	
Effects of Interfering Substances	17	0.05 (BSA)	0.35	0.1 (TCA)	4.5	0.393	50	
	18	–	0.40	0.1 (TCA)	4.5	0.059	0	
	19	0.05 (BSA)	0.35	0.1 (urea)	4.5	0.711	50	
	20	–	0.40	0.1 (urea)	4.5	0.056	0	
	21	0.05 (BSA)	0.35	0.1 (SDS)	4.5	0.160	50	
	22	–	0.40	0.1 (SDS)	4.5	0.168	0	
	23	0.05 (BSA)	0.35	0.1 (BME)	4.5	0.760	50	
	24	–	0.40	0.1 (BME)	4.5	0.110	0	
	25	0.05 (BSA)	0.35	0.1 (glycine)	4.5	0.769	50	
	26	–	0.40	0.1 (glycine)	4.5	0.119	0	

Take pictures or screen shots of the graphs, and upload them below.

Graph 1:

image.jpg Download



Upload files in PDF only!

- ✓ A single PDF (under 100 Mb)

- ✗ No binary files
- ✗ .png, .jpg, .gif, .heic
- ✗ Powerpoint
- ✗ Word doc
- ✗ Excel

Your Laboratory Manual

In each chapter:

Introduction

- Concepts, assays, and experiments in the chapter are explained

Problems

- While these problems are for your own benefit and will not be graded, you are highly encouraged to do these on your own. These practice problems will help with calculations for the *Notebook* section.

References

- A list of references from the *Introduction* section

Experimental Procedures

- A step-by-step explanation on how to perform the experiments

Notebook

- Use this section for completing your pre-lab and post-lab write-ups

Set-up and Materials

- A list of reagents, materials, and equipment you will need

Appendix

- Answers to the *Problems* section as well as other useful information to help you complete your write-ups

Your Laboratory Manual

Bring your lab manual to discussion

- Ask questions about unclear concepts and procedures

Do not bring the lab manual, or a photocopy, to lab

- The pre-lab write-up in your lab notebook should be all that you need to complete the experiment

Read the chapter introduction and procedure sections before each week of discussion to prepare for quiz

"As you progress through the lab manual after a few weeks, you will notice the *Experimental Procedures* section becomes less 'cookbook' and more of what a real protocol will look like. **It is your responsibility to figure out how to set up your tables, charts, master mixes, flowcharts, and data organization.**"

Student Friendly Features

Learning Points – reinforcing important key concepts

Hazardous Reagent – informing students of hazardous chemicals and reagents used in particular procedures

Time Saver – suggestions on how to better organize certain tasks to maximize efficiency in lab

Take Caution – calling attention to particular procedures or equipment that requires special care

Ask the Instructor – pointing out when TF assistance is needed/required

Tips & Tricks – suggestions on how to perform a particular procedure while reducing difficulty and hassle

Online Video

- **Links to Youtube videos by scanning the corresponding QR codes**

Using Your Laboratory Notebook

Each Week:

Before lab

- Read the introduction and procedure section
- Complete your **pre-lab write-up**
  - Read the notebook section of the lab manual to find out which data, tables and/or flowcharts are needed
- Submit electronic copy of pre-lab (Title, Purpose, Procedures) to Gradescope

During lab

- Record all of your findings for all assays and experiments

Before end of the lab

- Ensure that you and your lab partner(s) each have all the data needed
- Submit the data you collected to Gradescope before the end of the day in assignment **Post-Lab write-up**

After lab

- Begin/complete **Laboratory Report**, prepare for next week's lab

Complete Lab Reports Require:

Pre-lab write-up (submitted 30 min before start of your lab)

- Title, purpose, procedure

Data Collection (submitted before the end of your lab day)

- Show filled data tables and experiment recordings
- You are responsible for having all data in your notebook. Graphs and charts based off missing data will receive no credit and may be grounds for academic misconduct.

Post-lab analysis and questions

- Complete all sections in the template posted on Gradescope

Conclusions

- A complete paragraph for each post-lab report that summarizes the results of your experiments and any difficulties you encountered (less than 6 sentences)

Sample Calculations (Lab Reports)

- Show a sample calculation for each different type of mathematical manipulation that is required
- Credit will not be given to values with no provided sample calculations

Preparing professional tables/graphs/figures

Table:

Information about what is being shown (Title)

Table 6.1 - Cereal and Fe standard addition solutions

Solution #	Volume Cereal Solution (mL)[a]	Volume Standard Fe Solution (mL)[b]	Total Volume (mL)	Average Absorbance
1	10	0	100	0.0012
2	10	1	100	0.0025
3	10	2	100	0.0065
4	10	5	100	0.0125
5	10	10	100	0.0250
6	10	15	100	0.0375
7	10	20	100	0.0500
8	10	25	100	0.0630

[a]Measured with a volumetric pipet [b]Solution was 0.5 M ferrous sulfate

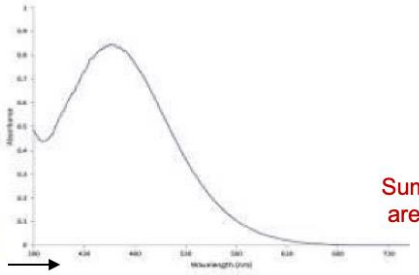
Header row, include units

Footnotes

Footnotes for extra information such as sample calculations.

Table needs title, located above the table.

Graph:



Axes with label and units when applicable

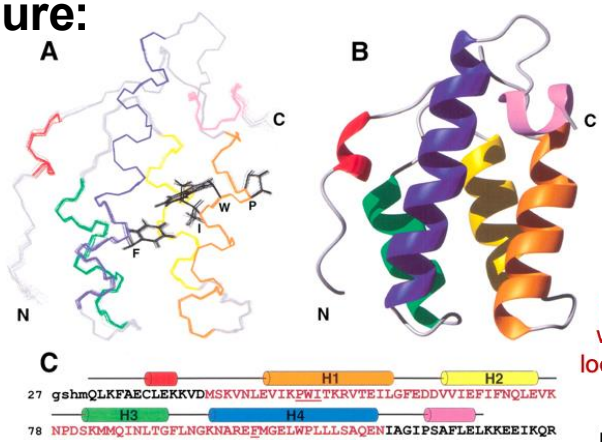
Summarize what you are looking at (Title)

Figure 1: UV-Vis spectrum of carboxyfluorescein in methanol (5×10^{-3} M). Data was collected using a 1.00 cm cuvette on a Cary 60 spectrophotometer, in the range of 380-730 nm with a1 nm step size and 5 s averaging time. The maximum absorbance wavelength, λ_{max}, is located at 455.0 nm.

How information was obtained

Conclusion drawn

Figure:



Summarize what you are looking at (Title)

Figure 3: Solution structure of the PWI motif from SRm160. (*A*) Best-fit superimposition of the backbone atoms from the 20 lowest-energy structures of SRm160 residues 27–126. Residues 127–134, which are disordered, are excluded from the figure for clarity. Helical regions are colored, and nonhelical regions are in gray. Locations of the signature Pro (50), Trp (51), and Ile (52) residues, as well as the highly conserved Phe (101) residue, are indicated in black. (*B*) Ribbon representation of the lowest-energy calculated structure. The orientation and color scheme are the same as in *A*. (*C*) Sequence of the polypeptide used in structure determination. Residues labeled in brown correspond to those that constitute the PWI domain, and the black letters indicate those found in the flanking sequences. Colored cylinders above the sequence indicate α-helices, and follow the same color scheme used in *A* and *B*.[3]

What is being presented

Use colors to emphasize key aspects and explain in caption

Refer to document posted on Blackboard for more details!

Figures do not have titles above them but are captioned on the bottom. Title (descriptive and informative) is first part of the caption located below the figure.

Questions regarding discussion and lab logistics?