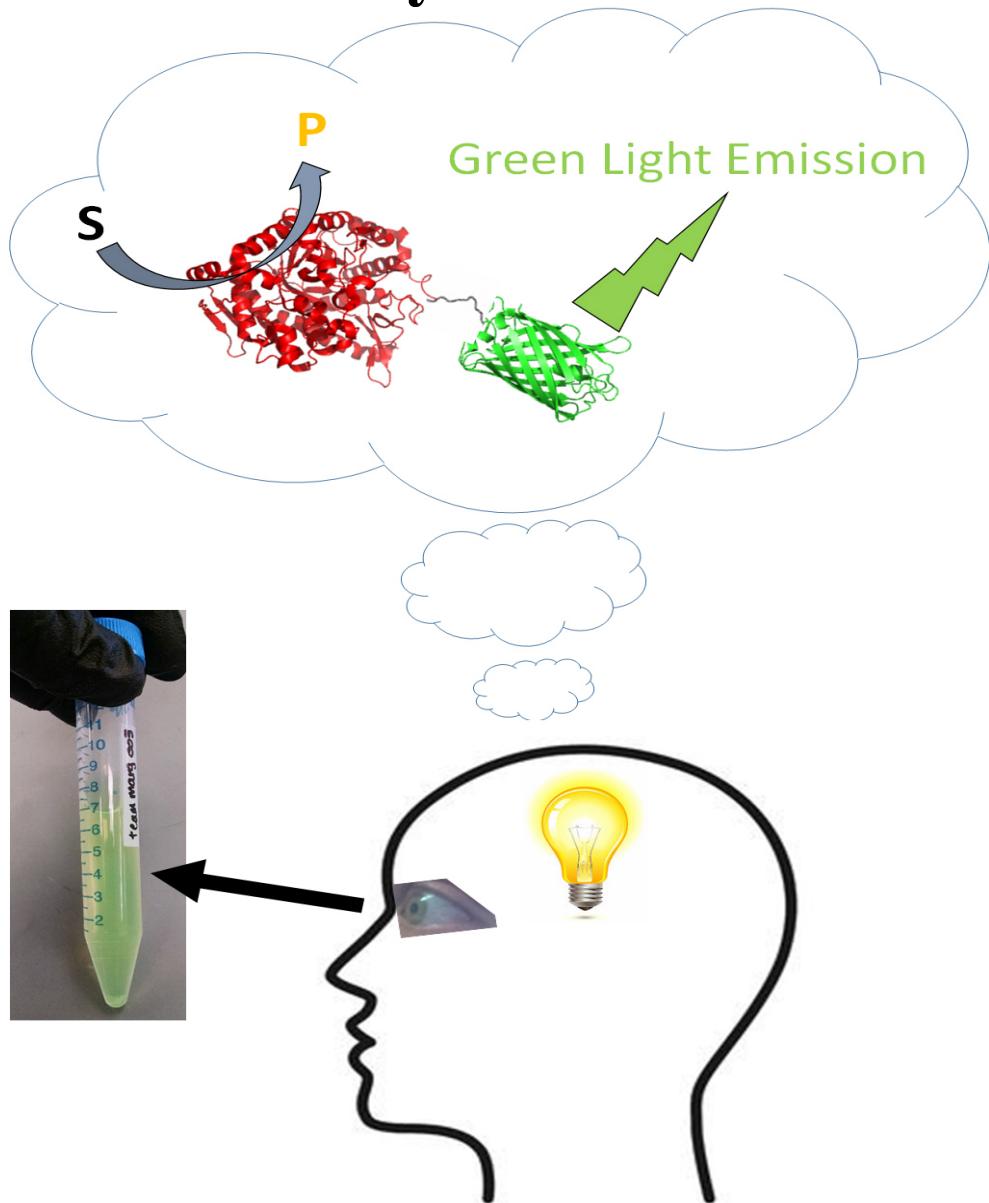


CHEM 4135

Biochemistry Laboratory

Syllabus



Let's see some biochemistry!!

Instructor: Dr. Jiyong Lee

Office: Ratliff Building South, Room 3007

Phone: 903-566-6275

Email: jiyonglee@uttyler.edu

Office Hours: Monday and Wednesday 10:30 am – 1:00 pm

Lab Meeting: Wednesday 1:00-6:00 pm in **Ratliff Building South, Room 4007**

Text: The lab manual is provided through the Canvas website for the course.

Required Equipment:

- 1) A bound notebook with index and carbonless copies
- 2) A scientific calculator
- 3) Close toed shoes
- 4) Safety goggles

Course Resources: Additional materials will be provided as either handouts or through the course Canvas site.

Course Content:

The course is designed to give students hands on experience in modern experimental biochemistry. Students will learn proper techniques in pipetting, buffer preparation, spectroscopy, protein and enzyme purification, gel electrophoresis, column chromatography, immunoblotting, enzyme kinetics, and protein crystallization.

Course Learning Objectives:

1. Provide thorough understanding of fundamental techniques in modern experimental protein biochemistry
2. Develop problem solving skills in experimental biochemistry
3. Encourage both collaborative and independent experimentation by students
4. Provide a learning environment where students are free to inquire and explore to gain a better understanding of the techniques and underlying principles

Grade Distribution:

The grades will be calculated according to the following scheme:

| | |
|---------------------------|-----|
| Pre-Lab Assignments | 10% |
| Communication Lab Reports | 60% |
| Comprehensive Lab Report | 30% |

Final grades will be determined on a standard grading scale of A 90-100%, B 80-89%, C 70-79%, etc.

Lab Reports:

Two types of lab reports will be due during the semester, 1) **communications** and 2) **comprehensive report**. The differences are explained as follows:

- 1) **Communications** summarize the results for a single lab or short sequence of experiments and are limited to a **maximum of 3 pages**, not including references.
- 2) **Comprehensive report** encompasses the findings from an entire series of experiments and is limited to a **maximum of 8 pages**, not including any references.

Lab reports should provide a clear, well thought out presentation of the data in its final, processed form (see lab report guideline). There will be 7 communication lab reports and 1 comprehensive lab report due and they are as follows:

Communications-

| | <u>Due Date</u> |
|---|-----------------|
| Exp. 1: Quantitative Pipetting | 01/28/26 |
| Exp. 2: Theory and Measurement of pH and pKa | 02/04/26 |
| Exp. 4: UV-Vis Spectroscopy | 02/18/26 |
| Exp. 5a: Lysis, Centrifugation, and Affinity Chromatography of CelB-GFP | 02/25/26 |
| Exp. 5b-c: SDS-PAGE and Western Blot of CelB-GFP | 03/18/26 |
| Exp. 5d-e: Enzyme Kinetics of CelB-GFP | 04/01/26 |

Comprehensive Reports-

| | |
|--|----------|
| Exp.5a – 5e CelB-GFP Purification and Characterization | 04/15/26 |
| Exp. 6 Comprehensive LDH Purification and Characterization | 04/22/26 |

Comprehensive reports will be a compilation of all results from an experimental series into a single, cohesive lab report.

Lab reports must be submitted electronically to the course Canvas site by the end (11:59 pm) of the due date. Lab reports that are submitted late will receive the following deductions from the total possible points:

Late 1 day or less: 10% points deduction

Late 2 days: 20% points deduction

Late 3 days: 30% points deduction

Late 4 days: 50% points deduction

Late 5 days: No credit

Pre-lab Assignments. Pre-lab questions will be posted on Canvas several days before the experiment is to be carried out. The Pre-lab will require calculations and answers to questions that will prepare students for the upcoming laboratory session.

Attendance and make-up policy:

Course attendance is required. Students who do not attend will not be able to carry out experiments and obtain data for their lab reports, which is required to receive full credit. The instructor should be notified of any expected absences according to the University of Texas at Tyler guidelines and may be excused for reasons allowed by the university (see statements below). Make-ups will be allowed only for reasons outlined in the University of Texas at Tyler bylaws (see below).

Laboratory Schedule

| | |
|----------|---|
| 01/14/26 | Exp. 1: Quantitative Pipetting Skills & Statistical Analysis |
| 01/21/26 | No Meeting (Martin Luther King Jr Holiday) |
| 01/28/26 | Exp. 2: Theory and Measurement of pH and pK _a |
| 02/04/26 | Exp. 3: Buffer Preparation |
| 02/11/26 | Exp. 4: Introduction to UV-Vis Spectroscopy |
| 02/18/26 | Exp. 5a: Protein Purification: Lysis, Centrifugation, and Affinity Chromatography of CelB-GFP |
| 02/25/26 | Exp. 5b: SDS-PAGE (CelB-GFP) and begin 5c: Western Blotting |
| 03/04/26 | Finish Exp. 5c: Western Blotting |
| 03/11/26 | No Meeting (Spring Break) |
| 03/18/26 | Exp. 5d: CelB-GFP Enzyme Kinetics |
| 03/25/26 | No Meeting (Online: Exp. 5e: CelB-GFP Kinetics Analysis) |
| 04/01/26 | Exp. 6a: Purification of Lactate Dehydrogenase (LDH) from Bovine Heart by Homogenization and Ammonium Sulfate Precipitation |
| 04/08/26 | Exp. 6b: Purification of LDH by Ion Exchange Chromatography |
| 04/15/26 | Exp. 6c: SDS-PAGE and Enzyme Kinetics of LDH and Exp. 7: Protein Crystallization set up |
| 04/22/26 | Exp. 7: Protein Crystallization and clean-up |
| 04/29/26 | No Meeting |

Final Exam: No written exam will be administered.

I reserve the right to make modifications as needed to the course. This will be done in accordance with university bylaws.

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. (For Fall, the Census Date is Sept. 12.) Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date (Sept. 11th) is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

The University of Texas at Tyler has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Like so many things this Fall, the need for accommodations and the process for arranging them may be altered by the COVID-19 changes we are experiencing and the safety protocols currently in place. Students with disabilities who may need accommodation(s) in order to fully participate in this class are urged to contact the Student Accessibility and Resources Office (SAR) as soon as possible, to explore what arrangements need to be made to ensure access. During the Fall 2020

semester, SAR will be conducting all appointments via ZOOM. If you have a disability, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student Application. For more information, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices> or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;

- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.

iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students:

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)