
Instructor: Steven Bruner bruner@ufl.edu Office: SFH 302E

Laboratory manual: Characterization of TEM1 β -Lactamase and Discovery of Inhibitors from *Streptomyces*. (PDF on Canvas, print copy available at Target Copy).

Laboratory Attire and Safety Precautions

Students should wear goggles, gloves, and closed toe shoes with hair pulled back at all times while in the laboratory. No shorts, loose clothing, or jewelry are allowed. In class laboratory sessions are reserved for experiments only; data analysis, lab write ups, and discussions will be done outside the lab. Failure to follow safety precautions and proper use of PPE will result in your removal from the laboratory.

Weekly pre-laboratory discussion: Wednesdays 11:45am–12:35pm LEI 242

Laboratory times: BLR3 (22053): Thursdays 9:45am–12:35pm; LEI 200
B3R6 (22054): Thursdays 12:50pm–3:50pm; LEI 200

Office hours: Prof. Bruner: Tuesday 9-10am or by appointment (email).

Teaching assistants: The teaching assistants for this course are: Javi Covington (covingtonj@ufl.edu) and Nesa Pesaran Afsharian (nessa.pesaranafs@ufl.edu). UG learning assistant: Mary Jo Herrera (herreramaryjo@ufl.edu). Office hours for the TAs TBA.

Course Description: This course provides a practical, hands-on understanding of modern, fundamental techniques relevant to molecular biology and biochemistry. The laboratory covers topics including DNA cloning and manipulation, basic bioinformatic analyses, protein overexpression and purification, along with enzyme kinetic measurements. Additionally, this course covers the discovery process for enzyme inhibitors and antibiotics from natural sources.

Course grading:	Laboratory notebooks	30%
	Laboratory reports (2)	40% (20% first report, 25% 2nd)
	Lab performance	5%
	Quizzes	10%
	Virtual lab 11 assignment	5%
	Calculations assignment	5%

Course grades will be assigned on a curve with the following percentages used for guidance: 100-85% A, 84-72% B, 71-60% C, 59-50% D, 50-00% F. For information on UF's Grading Policy, see:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>;

Laboratory E-Notebook entries will be graded throughout the semester, with a focus on general accuracy and completeness.

Lab reports will be due twice in the semester. Lab reports will cover weeks **1-5** and **6-11** (reports due on **3/1** and **4/17**, 5pm submission on Canvas). The guidelines for the reports will be given at least 2 weeks before the due date. At various times, announced quizzes will be given (online) to cover basic principles and concepts related to that week's lab.

Periodic pre-lab quizzes will be given on Canvas. The quizzes will be available after the lecture period and must be completed before lab. Quizzes will cover basic principles and concepts covered in lecture, as well as procedures that will be carried out in the upcoming lab. There are no makeup quizzes. If you miss a quiz due to an approved absence with appropriate documentation, accommodations will be made.

In addition to the required E-notebook for lab 10, a separate assignment based on calculations related to data analysis and kinetic assays will be assigned.

Late Assignments

Laboratory notebooks will be kept on OneNote. Grading dates will be announced, but since it is not "turned in" it cannot be turned in late. Please keep up with your notebook weekly. Pre-lab quizzes must be completed prior to the start of lab for your safety. There are no makeups for pre-lab quizzes.

Attendance: Attendance is required for all lab sessions. Due to the continuity of the labs in the course, missed labs can't be made up. Attendance at the pre-lab lecture is strongly encouraged. Please be on time for each lab period. Requirements for class attendance are consistent with university policies. If you miss a lab due to an approved absence with appropriate documentation, accommodations will be made.

The experiments in this course are arranged in a series, and the product from one week serves as the starting material for the next. If you have problems, you will be provided with intermediate materials with no grade penalty; however, you will be expected to analyze critically where the problem(s) lay in your lab report, and this analysis will be grade.

Student Responsibilities and Etiquette: You are expected to come to class/lab on time and behave in a manner that is respectful to the instructor and to fellow students. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at a minimum.

Lab notebooks: E-Notebooks (OneNote format) will be graded each week for accuracy and completeness. Notebooks should include a short description of the experiments including the scientific concepts of the experiment, all data collected during the laboratory

period, and any data analysis. To reduce the amount of things brought into lab, lab notebooks will be done electronically. You may bring a laptop or tablet into the laboratory to be kept in a designated area on the lab benches.

Students Requiring Accommodations: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the [Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. [Click here for guidance on how to give feedback in a professional and respectful manner](#). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. [Summaries of course evaluation results are available to students here](#).

University Honesty Policy: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” [The Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use: All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy: There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the [Notification to Students of FERPA Rights](#).

Campus Resources:

Health and Wellness: U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student. Counseling and Wellness Center:

counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-111 or 9-1-1 for emergencies. Sexual Assault Recovery Services (SARS) Student Health Care Center, 392-1161. University Police Department at 392-1111 (or 9-1-1 for emergencies), or police.ufl.edu.

Academic Resources: E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. Library Support, Various ways to receive assistance with respect to using the libraries or finding resources. Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Tentative lab schedule:

	<u>Lab #</u>	<u>DNA/protein biochemistry</u>	<u>Streptomyces microbiology</u>
Jan. 18	1	DNA PCR	Plate soil samples
Jan. 25	2	PCR agarose gel, PCR cleanup, double digests	Select/streak Streptomyces
Feb. 1	3	Digest agarose gel & cleanup, DNA quantitation	Re-streak Streptomyces
Feb. 8	4	Ligate, transform into TOP10, plate	Streak Strep for Antibacterial test
Feb. 15	5	prep plasmid DNA; Restriction Digestion	Spot test strains for Antibacterial test
Feb. 22	6	Digest Analysis; Pilot-Scale Expression Trials	Start Strep liquid culture/frozen stock
Feb. 29	7	TEM-1 expression analysis	Isolate/wash resin from liquid culture
March 7	8	Tem-1 purification	Extract metabolites w/ methanol
March 21	9	Purification tests (SDS-PAGE, Bradford, kinetics)	
March 28	10	Inhibition assays	Kinetics w/TEM-1 & Ab test
April 4	11	Virtual PyMol protein modeling	