Colorado State University Department of Biochemistry
BC 406A Investigative Biochemistry – Protein Chemistry
Fall Semester 2023

Instructor:	Aaron Sholders, Ph.D.
Office:	AZ E206D
Phone:	491-7916
E-mail:	aaron.sholders@colostate.edu

Teaching Assistant:	Andrew Dillon andrew.dillon@colostate.edu Leah Dixon leah.dixon@colostate.edu

Schedule: AZ E208 and Yates 307, TR 2:00-4:50PM (and hours arranged)

Textbook: Laboratory Notebook (in the bookstore under BC406)

Course goal:

Learning goal #1: *Students will learn to implement and execute an experimental design in order to test a hypothesis from a project currently being undertaken by research labs within the department.*

Learning goal #2: *Students will demonstrate proficiency in maintaining a research notebook that can be used by the research lab within the department from which their project originated.*

Learning goal #3: *Students will demonstrate proficiency in executing a number of biochemical, molecular biology, and cell biology experimental techniques.*

Learning goal #4: *Students will demonstrate the ability to interpret data from experimental techniques and articulate the relevance of these data to refutation or support of their original hypothesis.*

Assessment: Your grade will be derived from the following assignments:

1. ***Primer Design and Hypothesis – 25 points***
    a. ***Assignment can be found on Canvas***
2. ***Plan of Experimental Procedures – 25 points***
    a. ***Assignment can be found on Canvas***
3. ***Notebook – 50 points***
    a. ***Notebooks are to be purchased from the bookstore.***
    b. ***Each day is to include the following:***
        i. ***Date***
        ii. ***Purpose***
        iii. ***Procedure including:***

1. ***Materials and calculations for reagents/buffers***
2. ***Brief description of methods used***

iv. ***Results***

v. ***Conclusions***

4. ***Lab presentation - 50 points***
    a. ***Rubric is provided in Canvas***
5. ***Daily Check Out – 40 points***
    a. ***These are worth 4 points each and can be found on Canvas***
    b. ***You will be expected to hand-in one of these at the conclusion of each lab. Exceptions to this will be the 1st and last day of the lab.***

Grades: The following is a complete breakdown of point accumulation:

Assignment	Points
Primer Design	25
Experimental plan	25
Notebook	50
Lab presentation	50
Daily Check out	40
Total	**190**

Grade	Percentage
A+	97-100%
A	90 - < 97%
B+	87 - < 90%
B	80 - < 87%
C+	77 - < 80%
C	70 - < 77%
D	60 - < 70%
F	below 60%

What this means is that you are guaranteed at least those grades if you have those percentages. A curve may or may not apply to this class. I have, in the past, used a minus policy and reserve the right to do so depending on the distribution of the grades.

Attendance: This course has been designed for a student to work independently on a research project in order to advance discovery in a particular field of biochemistry. The expectation is that the student will be in the lab at least 6 hours a week at the arranged times (T/R from 2-5PM). In addition, the expectation will be that students may need to come in during "off-times"

(maybe even weekends) to set up experiments, prepare solutions, complete an experiment, etc. Students will be given a digital code to access the lab in order to do so. **IT IS THE STUDENTS RESPONSIBILITY** to ensure that experiments are being completed in a timely manner in order that data can be collected to advance knowledge and create constructs/reagents for the participating departmental lab. Lab participation points will be given to students that demonstrate a maximum effort in this capacity.

Lab Safety: Some general policies regarding lab safety:

1) Due to the COVID-19 Pandemic, we will be requiring that you wear masks.
2) No open toed shoes (shorts are fine).
3) No "horse-play" in the lab.
4) No eating or drinking in the lab.
5) Place Backpacks on racks.

Academic Integrity: This course will adhere to the Academic Integrity Policy found in the Colorado State University General Catalog.

Class Schedule:

BC406-FA23 Schedule	
Date	**Daily Task**
10/17	Course Introduction - 1. Explanation of Project 2. Explanation of expectations for lab notebook.
10/19	Benchwork: 1. Gibson cloning reaction. 2. Transformation.
10/24	Benchwork: 1. PCR colony screen and gel
10/26	Benchwork: 1. Plasmid miniprep 2. Send samples off for sequencing
10/31	Benchwork: 1. DNA data workup
11/2	Benchwork: 1. DE3 transformation

11/7	Benchwork: 1. Expression 2. Harvest on 11/8
11/9 - 11/16	Benchwork: 1. Protein Purification
11/28 - 12/5	Catchup