



Class time and location: MW11:30a – 12:45p (LIB 5514)
Instructor: Dr. Sonal Singhal
Office hours: [REDACTED]
Office: [REDACTED]
Phone: [REDACTED]
E-mail: [REDACTED]

Course Description

This course will use cover all the basics of genetics, but in more detail. How are proteins encoded by DNA? What determines when and where genes are turned on? How do mutations to genes affect gene expression and protein structure? In particular, we will focus on how molecular genetics is being used to develop new cures to human disease.

From the course catalog: Genome structure in relation to control of gene expression in prokaryotic and eukaryotic cells; interplay between genes and regulatory reactions that control development. Topics include antibody diversity, neoplastic transformation by oncogenes, and pattern formation.

Prerequisites: BIO 320, BIO 340

Student Learning Objectives

After finishing this class, you should be able to:

- Explain the basic biological principles behind cutting-edge biomedical technologies
- Decode and understand multiple sources of information related to genetics (including graphs, figures, and text)
- Understand how to design a study to test the efficacy of biomedical technology
- Discuss the social and ethical issues of genetics
- Share your ideas with each other & with me in writing and out loud

Materials

Required Material: None, but please have access to a computer or tablet. The school has some you can borrow for free! <https://techloaner.csudh.edu/>

Classroom Polices

Come to class ready to learn. This means arrive on time, don't have distracting side conversations, and avoid using your phone when I am lecturing or we are having class discussions. When you can, let me know if you must miss class. Because this is a group-work class, it will work best when we can all be here.

Grading

Your grade will be decided on four types of assignments.

- **Quizzes:** At the start of every module, you will take an in-person quiz. You will first take the quiz on your own & then in your groups. These two scores will be averaged. I will drop your lowest quiz score out of 6. No make-up quizzes will be given.
- **Exams:** After every two modules, we will have an in-class exam for a total of three exams. The exams will look VERY similar to the activities done in class, so coming to class will prepare you for the exam. Make-up exams will only be given for illness or family emergency.
- **Project:** You will be asked to do a project to extend your learning on molecular genetics in a direction of your own choosing. We will discuss more in class. This project will be due at the end of the semester. No extensions will be given.
- **Class Activities:** Over the course of the semester, we will do 19 in-class activities. These will be graded on completion only, and you will be allowed to turn in one per group. I will drop your lowest 4 class activities. (In other words, you can miss 4 activities with no repercussion to your grade.) No opportunity for make-up activities will be given, but you can do activities at home on your own time.

Activity	Points	Total Points	Percent of Grade
Quizzes (best 5 out of 6)	5	25	25%
Exams (3)	15	45	45%
Project	15	15	15%
Class Activity (best 15 out of 19)	15	15	15%

Grades will be assigned on a standard scale:

94 - 100: A	80 - 82: B-	67 - 69: D+
90 - 93: A-	77 - 79: C+	60 - 66: D
87 - 89: B+	73 - 76: C	0 - 59: F
83 - 86: B	70 - 72: C-	

Policy on Artificial Intelligence (AI)

Whether or not we like it, AI is going to be part of our lives moving forward. I do not permit the use of AI on quizzes or exams, but you can use it for your project (we will discuss acceptable use in class) and for some class activities (assume you cannot use it unless I tell you otherwise). Any use of AI needs to be cited, just as you would cite any other source. We will discuss appropriate citation format in class.

Recommendations for Success

How can you be successful in this class?

- **Follow the suggested schedule.** I built a lot of flexibility into this class, but if you let work build up, it will become too much and become hard to manage.
- **Work with your peers.** I put you into groups because research shows we learn better together. Plus, your fellow Toros are a generally kind, fun bunch! Work with your friends!
- **Come visit me in my office, SCI 210.** Chatting one-on-one can be easier than chatting in class, and sometimes, focused attention can help resolve sticky points in a writing assignment.
- **Contact me when life gets complicated.** You don't need to tell me what is going on, but you do need to tell me that you need extra support or time to finish up the class.
- **Have fun!** I purposefully am creating a more relaxed pace & have built some flexibility into this class because I am asking you to do hard things. So, enjoy the pace and try to have fun with the material. Stress makes it harder to learn.

Tentative Schedule			
Date	Module	Topic	Assessment
Wed., Jan. 22	Introduction to Class		
Mon., Jan. 27	1	Gene Editing (CRISPR & Viral-based)	Quiz 1
Wed., Jan. 29	1	Gene Editing (CRISPR & Viral-based)	Activity 1
Mon., Feb. 3	1	Gene Editing (CRISPR & Viral-based)	Activity 2
Wed., Feb. 5	1	Gene Editing (CRISPR & Viral-based)	Activity 3
Mon., Feb. 10	2	mRNA vaccines	Quiz 2
Wed., Feb. 12	2	mRNA vaccines	Activity 4
Mon., Feb. 17	NO CLASS – PRESIDENT’S DAY		
Wed., Feb. 19	2	mRNA vaccines	Activity 5
Mon., Feb. 24	Exam 1 (on Modules 1 & 2)		
Wed., Feb. 26		Project Day	Activity 6
Mon., Mar. 3	3	Cancer Immunotherapy	Quiz 3
Wed., Mar. 5	3	Cancer Immunotherapy	Activity 7
Mon., Mar. 10	3	Cancer Immunotherapy	Activity 8
Wed., Mar. 12	3	Cancer Immunotherapy	Activity 9
Mon., Mar. 17	4	Personalized Genomics for Cancer	Quiz 4
Wed., Mar. 19	4	Personalized Genomics for Cancer	Activity 10
Mon., Mar. 24	4	Personalized Genomics for Cancer	Activity 11
Wed., Mar. 26	4	Personalized Genomics for Cancer	Activity 12
Mon., Mar. 31	NO CLASS - SPRING BREAK		
Wed., Apr. 2	NO CLASS - SPRING BREAK		
Mon., Apr. 7	Exam 2 (on Modules 3 & 4)		
Wed., Apr. 9		Project Day	Activity 13
Mon., Apr. 14	5	STEM Cell Therapy	Quiz 5
Wed., Apr. 16	5	STEM Cell Therapy	Activity 14
Mon., Apr. 21	5	STEM Cell Therapy	Activity 15
Wed., Apr. 23	5	STEM Cell Therapy	Activity 16
Mon., Apr. 28	6	Epigenetic Therapeutics	Quiz 6
Wed., Apr. 30	6	Epigenetic Therapeutics	Activity 17
Mon., May. 5	6	Epigenetic Therapeutics	Activity 18
Wed., May. 7	6	Epigenetic Therapeutics	Activity 19
Wed., May 14	Final (Exam 3 on Modules 5 & 6)		
Thurs., May 15	Project due at midnight on Canvas		

University Policy

Academic Integrity: This course will be conducted in accordance with the University Policy on Academic Integrity (p.14 University Catalog). Any student caught cheating or plagiarizing will receive an F (0 points) on the assignment and will be penalized according to University regulations. Cheating or plagiarism is subject to discipline as provided in Title 5, California Code of Regulations. Plagiarism is a very serious offense. See the University Catalog under Academic Integrity for further information.

Exams: no cellphone use of any kind is allowed during exams. Cellphones will be turned off and secured in your bookbag, which will be placed on the floor for the duration of the exam.

Plagiarism: it is imperative that you cite all your sources on assignments. Academic misconduct of any kind, including cheating on exams and plagiarism, will result in a grade of F for the course, and possibly other sanctions. Once you have completed this course, do not share assignments etc. with students in subsequent semesters. If anyone turns in your assignment in a future semester, you will be held accountable and face sanctions.

Disruptive Students: Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. The instructor may require a student responsible for disruptive behavior to leave class pending discussion and resolution of the problem and may report a disruptive student to the Student Affairs Office (WH A-410, 310-243-3784) for disciplinary action.

CSUDH adheres to the Americans with Disabilities Act with respect to providing reasonable accommodations for students with temporary and permanent disabilities. To receive accommodations, students with disabilities must register with Students disAbility Resource Center. For more information, please contact their office in Welch Hall D-180 at (310) 243-3660 (voice) or (310) 243-2028 (TDD).

Computer/Information Literacy Expectations for Students enrolled in this class: Students in this class are expected to:

- Use assigned Toromail account or other university approved email.
- Have ability to navigate and use Blackboard.
- Have basic information and computer literacy in one of the computer formats (Windows, Macintosh, or GNU/Linux).
- Upload files in all of the computer formats (.doc, .docx, .jpeg, .ppt, .pdg, .xps).
- Access and choose appropriate library and other scholarly sources of information.
- Search for and find relevant scholarly information effectively.
- Be able to paraphrase concepts without plagiarizing.
- Maintain the minimum computer Hardware requirements*
- Maintain the minimum computer Software requirements*

*Please visit <http://www.csudh.edu/academic-technology/instructional-technologyresources/online-courses-tech/> for the most up-to-date Hardware & Software computer requirements