

EXAMPLE – DO NOT COPY and PASTE

Request to register for BIOE 195 with a non-BIOE Faculty as the Instructor of Record

BIOE Undergraduate Student Name:

Date:

Research Plans: For Fall Semester 2024, I would like to 4 units of BIOE 195 with Dr. McCloskey. I previously enrolled in ENGR/MSE 195 with Dr. McCloskey over the summer, I worked on culturing human umbilical vein endothelial cells (HUVECs) on polyacrylamide (PAA) hydrogels with controlled stiffnesses and with or without lysophosphatidic acid (LPA) treatment, suggested to aid cell's ability to sense and/or respond to mechanical signals. The goal was to explore the role of various stiffnesses of polyacrylamide in inducing tip/stalk phenotype of stem cells endothelial progenitor cells. This project involved a lot of hands-on laboratory techniques including generation of hydrogels at controlled stiffnesses, sterile cell culture, fluorescent staining, fluorescent imaging, and image processing using NIH Image with a Fiji plugin. Preliminary data shows that stiff matrix, glass ($> 1\text{GPa}$) versus 10kPa does direct more cell YES-associated protein (YAP) translocation, a mechanoresponsive indicator, into the nucleus compared with in the cytosol of the cells, and that the cells on the softer matrix exhibit an elongated tip-like phenotype with more extended filipodia. This semester, I will learn and use flow cytometry to quantify the expression of tip-specific marker delta-like ligand 4 (Dll4) on the differentiating cells and begin working, with my postdoctoral student mentor Jose Zamora, on a manuscript publication.

Grading Plan: Letter grade only. BIOE 195 students are expected to attend and participate in weekly group meetings. This semester, these are held R 9:30-11:30am. They are expected to engage in total research activities at 3 hours per week per credit/unit (4 units = 12 hours per week). At the end of the semester, the student will present their semester research in our group meeting and will write up a ~5-7 page research report, including figures/data.