

## **Term time REU positions**

The Mycofluidics lab is looking to recruit two undergraduates to work on image analysis projects. Students will gain experience of designing and carrying out research and writing papers (four student research projects resulted in Mycofluidics lab papers this year). You can learn more about the Mycofluidics lab here:

<http://www.math.ucla.edu/~mroper/www/Myco-fluidics.html>

Brief descriptions of the two research projects follow:

### **Project description:**

#### 1) Mapping cellular clocks

Like humans, many microbes have circadian rhythms; internal clocks that direct them to perform different tasks at different times of day. We are collaborating with a group at Dartmouth University to study how these clocks work in the fungus *Neurospora crassa*. Our collaborators can produce microscope images showing mRNAs (the messenger molecules that instruct proteins to be made), and nuclei as differently colored bright spots. Our goal for this project is to automate the processing of these images, by adapting template matching methods already developed in our lab, and to analyze where mRNAs can be found in each cell.

#### 2) Cellular quorum sensing

Microbes adapt their behaviors depending on whether they find themselves alone, or surrounded by genetically similar microbes. Biologists suspect that all microbes are capable of this kind of quorum sensing, but there are few detected instances. In our lab we are running experiments to measure the ability of fungal spores to detect other spores, and the effect this has on their germination. We can program our microscope to image fields of spores at hourly intervals. The goal of this project is to turn these images into data about the effect of spore clustering on germination rates. Students will adapt template matching methods already used in our lab, and develop methods for segmenting (detecting) spores in images.

### **What we are looking for:**

We are looking for undergraduate students with some experience of programming in Matlab (or in another language, but who are enthusiastic about learning Matlab), who enjoy challenges, and are thinking about graduate school. Students are expected to work in the lab for at least two quarters.

**Details:**

Students should plan to work 6 hours per week on their REU project.

Stipends are available for US citizen and permanent resident students (NSF does not allow grant support for international undergraduates, sorry). Stipends depend on the scope of the project that each student takes on, but will be equivalent to \$12.50 per hour of lab work.

**Application:**

Please send a copy of your resume, a short statement of your plans after you graduate from UCLA, and an updated "unofficial" transcript, DPR or DARS, to [mroper@math.ucla.edu](mailto:mroper@math.ucla.edu). If you are submitting a DARS report, print the "PDF Audit."