**Thank you for your interest in joining the Lowery Lab as an Undergraduate Lab Assistant!**

The mission of our lab is to make significant advances towards understanding how the cytoskeletal machine is regulated during cell migration in normal and pathological conditions, while doing so in a supportive, fun, and engaging environment of scientific discovery and training. Our research utilizes high-resolution live imagingand computational analysis of cytoskeletalbehavior in cultured *Xenopus laevis* (African-clawed frog) neurons and neural crest cells to address this goal.

We are interested in finding **undergraduate students** who would look at this opportunity as a potential long-term commitment. Prior class and research experience is preferred, but not required. We are most interested in students that can demonstrate enthusiasm for our research, a committed work ethic, good time management skills, patience and capacity to work with a diverse team of lab members, and a willingness to deeply engage through action and inquiry in the intellectual concepts we are studying.

This position does not come with funding. In future semesters, Research for Credit is ideal. Initial duties in the lab would include housekeeping tasks (making solutions, aliquoting reagents, doing the dishes, etc.) and weekly *Xenopus* embryo dissections. These duties will help hone your laboratory and microscopy skills. Duties will also include assisting in aspects of research projects with technicians, graduate students and senior undergraduates, and may consist of using molecular, genetic, cellular, advanced microscopy, graphic design, and frog husbandry techniques. Note that Research for Credit requires a time commitment of 15-20 hours each week.

Note that you MUST be able to attend lab meetings (day/time still TBD) in order to be eligible to join the lab.

**If you are interested in this opportunity, e-mail your completed application package to the Lowery Lab Manager, Chiedza Sibanda, at chiedza.sibanda@bmc.org.**

**Your application must include all of the components listed below to be considered:**

* The subject line of your e-mail should read: Undergraduate Assistant Fall 2024 + your last name

Example: Undergraduate Assistant Fall 2024 Smith

* Attach your CV or resume to the e-mail as a .doc, .docx, or .pdf
* Attach an unofficial transcript of your grades in all classes taken at BU
* In the body of your e-mail, provide information to the following questions:

1. Name, Year of graduation, Major
2. Why does our lab’s research interest you?
3. What do you hope to gain from this experience?
4. What do you think you can offer our lab group?
5. What kind of time commitment are you looking for – does this include future summers?
6. Briefly describe any prior research experience you may have.
7. What are your future career aspirations?
8. Is there anything else you feel we should be aware of when considering your application?
9. Rate yourself in the following areas, with 1 as exceptional and 5 as needs improvement

Organization 1 2 3 4 5 n/a

Creativity 1 2 3 4 5 n/a

Independence 1 2 3 4 5 n/a

Scientific knowledge 1 2 3 4 5 n/a

Interest in research 1 2 3 4 5 n/a

Common sense 1 2 3 4 5 n/a

**Additional Questions:**

Please do not let these stress you out. They are not meant to be trick questions and you should not overthink them. You are welcome to look things up, and “I don’t know” or “I haven’t yet covered this topic in my coursework” are possible answers.

1.     The lab is interested in studying the gene *Bcl11b*, which has recently been linked to various developmental disorders in humans. If studying this gene in *Xenopus laevis* were your research project, what are the first few steps you would take to get information about the function of this gene during embryonic development?

2.     You need to make S-NET buffer for your DNA isolation. The recipe calls for final concentrations of 10mM Tris, 0.1M EDTA and 0.5% SDS. What should you combine (and in what order?) to result in a 500 mL solution? Assume that you are beginning with 1M Tris, 1M EDTA, and 100% SDS solution. Show your work.

3.     What is PCR? In general terms, how does it work and why might you use it?

4.     While the Lowery Lab mainly uses *Xenopus* as our model system, we may someday collaborate with the Hagedorn lab, which studies zebrafish. In one of your experiments, you spawn a group of zebrafish, each heterozygous for a recessive mutation called *opallus*. What ratio of homozygous mutants and heterozygotes do you expect in the resulting clutch? If you produce a clutch of 83 offspring, how many mutant phenotypes do you expect?

5. What is 4.5e-4 L in conventional notation? What is it in uL in both scientific and conventional notation? What tools might you use in a lab to measure such an amount?

E-mail your completed application by September 1, 2024 (**but early submissions are encouraged**). Applicants selected for in-person interviews will be contacted. The Lab is looking to take on 2-3 new students this semester.

Thank you for your interest in the Lowery Lab!

Best wishes,

Laura Lowery

Associate Professor

Associate Chief for Faculty Affairs

Director of Diversity, Equity, and Inclusion

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