POSTDOCTORAL FELLOWSHIPS IN OCULAR BIOENGINEERING (TWO POSITIONS)

The Ethier lab invites applications from outstanding candidates for two postdoctoral fellow openings.

1. **Stem Cell Treatments for Glaucoma.** The trabecular meshwork (TM) is the key tissue controlling pressure in the eye. Its dysfunction leads to elevated pressure, the major risk factor for glaucoma, which is the most common irreversible blinding disease in the world. Unfortunately, existing tools to restore TM function are non-existent, and thus regenerative medicine therapies to restore TM function are attractive. The fellow will be responsible for designing, optimizing and testing systems for magnetic steering and visualization of stem cells in the anterior eye, with the goals of enhancing cell delivery efficiency to the TM and the functional impact of these cells. This project is a close collaboration with the Ultrasound Imaging and Therapeutics Research Lab at GT, combining advanced imaging with tools to improve stem cell function.

2. **High-content screening system for novel glaucoma drug treatments.** There remains a need for more compounds to lower/control intraocular pressure (IOP) in glaucoma patients. Recent work has shown that the mechanobiology of the inner wall of Schlemm’s canal (a part of the TM) plays an important role in IOP homeostasis. Specifically, fluid outflow from the eye is facilitated by localized stretching of Schlemm’s canal cells, which leads to the formation of fluid-conducting pathways (“pores”). The fellow will be responsible for construction of a novel device for mechanostimulation of Schlemm’s canal cells, and for development of automated, imaging-based assays to determine cell permeability. This system will form the basis of a high-content drug screening system to identify new IOP-lowering small molecules.

**KEY RESPONSIBILITIES:**

Position 1: Culture and labeling of stem cells for in vitro and in vivo experiments, including characterization of multipotency and viability; magnet design/optimization to steer cells labelled with superparamagnetic nanoparticles; delivery of stem cells into pig and mouse eyes; visualization of stem cells in the anterior eye by histology and advanced imaging methods; assessment of stem cell function in situ; compilation and interpretation of data; manuscript, abstract, grant and talk preparation.

Position 2: Design and fabrication of hardware for mechanostimulation of cultured Schlemm’s canal cells; maintenance of cultured cells; development of algorithms for image processing of cell permeability assay results; characterization of mechanostimulation system; integration of system into a high-content small molecule screening workflow; compilation and interpretation of data; manuscript, abstract, grant and talk preparation.

**EDUCATION, SPECIALIZED KNOWLEDGE AND EXPERIENCE:**

Degrees required for these jobs: PhD in Biomedical Engineering or related scientific field.
KNOWLEDGE AND SKILL QUALIFICATIONS:

Position 1
- Significant experience in stem cell characterization at the message, protein and functional levels.
- Knowledge of fluid handling and perfusion systems, and of standard histologic techniques.
- Excellent manual skills, including ability to dissect and handle very small and delicate tissue specimens.
- Experience with assisting in preparation of scientific manuscripts and grants
- Proven ability to think creatively and troubleshoot difficult problems.
- Outstanding communication skills and desire to work in a multi-disciplinary research environment, with a focus on research translation.
- Experience withocular physiology/biology is a definite plus.

Position 2
- Significant experience in microsystem design, construction and testing.
- Experience in automated microscopy and image processing.
- Experience with cell culture
- Experience with assisting in preparation of scientific manuscripts and grants
- Proven ability to think creatively and troubleshoot difficult problems.
- Outstanding communication skills and desire to work in a multi-disciplinary research environment, with a focus on research translation.
- Experience with ocular physiology/biology is a definite plus.

About the Department
The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University was created jointly by the Emory University School of Medicine and the Georgia Tech College of Engineering. As such, we offer the best of both internationally renowned institutions. The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech has been consistently ranked as one of the top BioE/BME programs for several consecutive years. This program is part of a vibrant biomedical community in Atlanta that includes the Emory School of Medicine, Center for Disease Control and Prevention (CDC), Winship Cancer Institute, Children’s Healthcare of Atlanta (CHOA), Georgia ImmunoEngineering Consortium, Institute for Electronics and Nanotechnology, Petit Institute for Bioengineering and Bioscience, and more. This rich scientific environment provides unique and unparalleled research opportunities, including seminars given by leaders in science and engineering from throughout the U.S. and abroad, opportunities for collaborations, exposure to diverse research programs, and sophisticated core facilities.

Start Date: Review of applications will begin immediately and continue until the positions are filled.

Application Procedure: Interested candidates should send the following materials to ross.ethier@bme.gatech.edu, using the subject line: Postdoctoral Fellow Application (Ethier Lab). Please specify whether you are applying for Position 1 or 2.
- A current CV
- The names and contact details of at least 3 referees
- A statement of research career goals
- An explicit description of how the candidate’s previous experience addresses the qualifications listed above.

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