

PREP Research Associate

This position is part of the National Institute of Standards (NIST) Professional Research Experience (PREP) program. NIST recognizes that its research staff may wish to collaborate with researchers at academic institutions on specific projects of mutual interest, thus requires that such institutions must be the recipient of a PREP award. The PREP program requires staff from a wide range of backgrounds to work on scientific research in many areas. Employees in this position will perform technical work that underpins the scientific research of the collaboration.

Research Title:

Developing Cell Counting Reference Materials

The work will entail:

Cell count and viability are critical measurements in the testing and manufacturing of regenerative medicine products and cell-based therapies. New methods are being developed that can better support continuous monitoring of cells during manufacturing and release testing of cells to assure proper dosing of therapies. Reproducibly developed control materials and robust experimental designs are needed to evaluate new assays and support assay validation. In this project the undergraduate researcher will support the development and testing of cell-based control materials by culturing cells, treating cells to induce controlled cell damage and death, generating fixed cellular reference materials, and evaluating cell health and viability to establish cellular test materials with well characterized health profiles. Work will include aseptic cell culture, sample handling and manipulations for several mammalian cell lines, image and data acquisition and analysis, experimental design, and database maintenance, using multiple modes of cell count and viability analyzers, and microscopy. The methods developed in this project will support the testing of novel cell viability measurement techniques and will support the development of documentary standards for cell viability.

Key responsibilities will include but are not limited to:

- Maintaining a database of acquired images and handling large data files
- Working with software programs including Python, Image J/Fiji, and Excel for image and data analysis
- Implementing Design of Experiment (DOE) strategies for image analysis and identification of live and dead cells
- Developing and running automated microscopy protocols for cell viability
- Working with cell viability analyzers and software programs
- Conducting cell culture
- Analyzing and integrating data from different analytical techniques.
- Presenting results at internal meetings and occasional meetings with collaborators.
- Ensuring that results, protocols, software, and documentation have been archived or otherwise transmitted to the larger project.

Qualifications

- Completed undergraduate or associate level lab and course work in biochemistry, biology, biotechnology or other relevant topic
- 1 year of relevant experience in biotechnology lab work.

- Familiarity with cell culture and cell counting
- Familiarity with biological sample handling including pipetting and aseptic technique
- Familiarity with data handling in excel or R.
- Programming skills in Python, MATLAB, R or other computing language is desirable
- Strong oral and written communication skills.

Privacy Act Statement

Authority: 15 U.S.C. § 278g-1(e)(1) and (e)(3) and 15 U.S.C. § 272(b) and (c)

Purpose: The National Institute for Standards and Technology (NIST) hosts the [Professional Research Experience Program \(PREP\)](#) which is designed to provide valuable laboratory experience and financial assistance to undergraduates, post-bachelor's degree holders, graduate students, master's degree holders, postdocs, and faculty.

PREP is a 5-year cooperative agreement between NIST laboratories and participating PREP Universities to establish a collaborative research relationship between NIST and U.S. institutions of higher education in the following disciplines including (but may not be limited to) biochemistry, biological sciences, chemistry, computer science, engineering, electronics, materials science, mathematics, nanoscale science, neutron science, physical science, physics, and statistics. This collection of information is needed to facilitate administrative functions of the PREP Program.

Routine Uses: NIST will use the information collected to perform the requisite reviews of the applications to determine eligibility, and to meet programmatic requirements. Disclosure of this information is also subject to all the published routine uses as identified in the Privacy Act System of Records Notices: NIST-1: NIST Associates.

Disclosure: Furnishing this information is voluntary. When you submit the form, you are indicating your voluntary consent for NIST to use of the information you submit for the purpose stated.