PREP Research Associate

This position is part of the National Institute of Standards and Technology (NIST) Professional Research Experience Program (PREP). NIST recognizes that its research staff may want to collaborate with researchers at academic institutions on specific projects of mutual interest and, therefore, requires those institutions to be recipients of a PREP award. The PREP program involves staff from a wide range of backgrounds conducting scientific research across various fields. Individuals in this position will perform technical work supporting the collaboration's scientific research.

Research Title:
Developing Workflows for Cell Viability and Metabolic Activity

The work will entail:

Mammalian cell metabolic activity refers to the collection of biochemical processes that sustain life in mammalian cells, including energy production, nutrient utilization, biosynthesis, and waste management. Measuring metabolic activity provides insight into dynamic changes in cell state, enabling improved monitoring and control of cell growth, health, and function in culture systems.

This work focuses on development and implementation of in vitro cell-based studies, with a strong emphasis on evaluating cell viability, metabolic activity, and data interpretation associated with these assays. A range of analytical tools and technologies will be employed throughout the project, including real-time live-cell imaging systems, automated cell counters, bioanalyzers, and high-resolution metabolomic platforms. These complementary techniques are intended to provide comprehensive insights into the functional state of cells and may be instrumental in defining critical quality attributes for cellular therapeutic products.

The student will play an active role in supporting the measurement of extracellular metabolites, as well as assessing cell confluency and morphology using advanced imaging techniques.

In addition to laboratory work, the student will contribute to the development and optimization of experimental protocols, manage and curate datasets, and perform statistical and computational analysis of the resulting data. This experience will provide valuable exposure to both experimental and analytical aspects of cell-based research.

U.S. Citizen Preferred

Key responsibilities will include but are not limited to:

- Conduct cell culture.
- Design and execute cell culture experiments using different mammalian cell types.
- Perform metabolomics sample preparation and analysis (e.g., bioanalyzer and mass spectrometry).
- Collect and analyze imaging data (confluence, morphology).
- Analyze, visualize, and integrate datasets across multiple analytical techniques using GraphPad Prism and Microsoft Excel.
- 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

- 1 year of relevant experience in biotechnology lab work and cell culture.
- Completed 2 semesters of undergraduate level lab and course work in biochemistry, biology, biotechnology or other relevant topics.
- Familiarity with mass spectrometry.
- Familiarity with biological sample handling including pipetting and aseptic technique.
- Familiarity with data handling in Excel or R and GraphPad Prism.
- 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.