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:
Design Principles for Building Microbiomes

U.S. Citizen Preferred

The work will entail:
Great potential exists in engineering complex microbial communities (called microbiomes) to benefit our modern society with relevance to human health, agricultural productivity, biomanufacturing, waste remediation, and infrastructure longevity. To execute such bioengineering achievements, we must implement methods that can effectively focus our attention and design on the microbial taxa that will be useful. New experimental and analytical methods are being developed to create synthetic microbial communities (SynComs) with reproducible functional outcomes. In this project the undergraduate researcher will participate in the validation of culturing, molecular and/or analytical approaches to develop SynComs, based on the student's expertise and interest. Skills learned may include experimental design, microbial culturing techniques, media preparation, spectrophotometry, DNA extractions, PCR, bioinformatic data processing, and statistical analyses. The lab is a Biosafety Level 2, which requires use of biosafety cabinets (with required training), lab jackets, and eye protection. The research conducted in this project will support method development to engineer microbiomes with relevance to the US Bioeconomy. Researchers interested in lab-only or analytical-only aspects of the project will be considered.

Key responsibilities may include but are not limited to:
- Implementing design of experiment strategies for experimental set-ups and data analysis
- Conducting microbial cell culture
- Developing and running microbial cell culture experiments
- Using spectrophotometry and software programs
- Conducting DNA extraction, PCR and next-generation sequencing library preparation
- Analyzing and integrating data from different analytical techniques, including network analysis
- Maintaining a database of acquired data and handling large data files
- Working with software programs including R and/or Python, and Excel for data handling and analysis
- 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

- Undergraduate or associate level lab and course work in bioinformatics, microbiology, biotechnology or other relevant topics (currently enrolled or completed)
- Strong oral and written communication skills
- Familiarity with microbial cell culture and counting
- Familiarity with biological sample handling including pipetting and aseptic technique
- Familiarity with data handling in excel or R
- Programming skills in Python, R or other computing language is desirable
- 1 year of relevant experience in biology lab work is desirable

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.