

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:

Quantifying DNA Extraction Efficiency in Microbial Species of Relevance to Biosurveillance, Biotherapeutics, and Microbiome Studies

The work will entail:

The objective of this project is to conduct a benchmarking study that compares commercial DNA extraction kits with our focused ultrasonication protocol. This study is part of a larger initiative aimed at evaluating the efficiency of DNA extraction across various microbial species using a high-efficiency, agnostic lysis protocol.

The selected candidate will optimize parameters to extract DNA with high efficiency using focused ultrasonication. The work will involve a panel of microbes, including Gram-positive (G+) and Gram-negative (G-) bacteria, spores, and fungi, which are relevant to the biotechnology, diagnostics, and microbiome sectors.

Tasks will include operating a focused ultrasonication instrument and a Bioanalyzer to measure DNA fragment sizes, as well as conducting a fluorimetric assay to assess extraction efficiency. Additionally, the student will be responsible for culturing and counting the cells. We encourage candidates with experience in microbial cell culture and a willingness to learn new techniques, such as focused ultrasonication and Bioanalyzer usage, to apply.

Key responsibilities will include but are not limited to:

- Investigating the potential use of focused ultrasonication on a panel of microbes hard to lyse.
- Using different techniques to conduct the research. Techniques include focused ultrasonication (Covaris), fluorimetric assays, and a bioanalyzer to measure the size of fragmented DNA.
- The candidate will be responsible for culturing and counting cells.
- Attending a weekly meeting with the supervisor for project progress.
- Presenting results at the end of the internship to summarize the findings and writing a final report.

Qualifications

- Candidates who have taken courses in biotechnology, biology, microbiology, or a related field are encouraged to apply.
- Familiarity with wet lab experiments, including culturing cells in broth and on agar, and data analysis is required.
- Additionally, we invite candidates who are eager to learn new techniques, enjoy asking questions, and are comfortable facing new challenges to apply.

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.