

Opportunity Title: USDA-ARS Fellowship in Development of High-Throughput Methods for Bacterial Pathogenicity Screening

Opportunity Reference Code: USDA-ARS-SE-2024-0169

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SE-2024-0169

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A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. Click [here](#) for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations

All documents must be in English or include an official English translation.

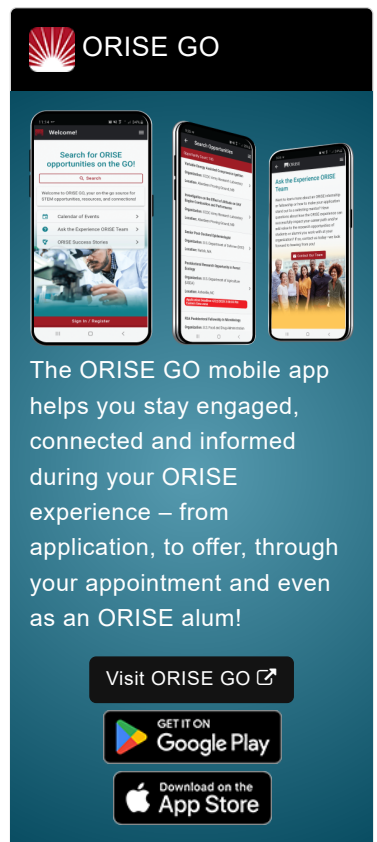
Application Deadline 2/28/2025 11:59:00 PM Eastern Time Zone

Description *Applications are reviewed on a rolling-basis.

ARS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), located in Irvine, California.

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific in-house research agency with a mission to find solutions to agricultural problems that affect Americans every day from field to table. ARS will deliver cutting-edge, scientific tools and innovative solutions for American farmers, producers, industry, and communities to support the nourishment and well-being of all people; sustain our nation's agroecosystems and natural resources; and ensure the economic competitiveness and excellence of our agriculture. The vision of the agency is to provide global leadership in agricultural discoveries through scientific excellence.

Research Project: Salmonellosis sickens approximately 2 million Americans annually. There are currently over 600,000 sequences of Salmonella genomes but we are unable to accurately predict the pathogenicity of Salmonella strains from genomes in part because we lack phenotypic data on how pathogenic a strain is. The gentamicin protection assay is an in vitro assay that measures Salmonella invasion and proliferation in mammalian cells, but it is a slow and challenging assay to perform. This research project aims to develop an NGS approach to the assay that can generate phenotype information on hundreds of strains rapidly. The method could be widely applied to study bacterial pathogenesis across species and will generate pathogenicity data to train machine learning models for pathogenicity prediction. The participant will be assigned to the project to help focus on mammalian cell culture, mutant

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construction, single-cell sequencing, and will handle large numbers of bacterial strains using a BioMek FX robot. The participant will use bioinformatics analysis and will learn about the training of large-scale machine learning models.

Learning Objectives: Under the guidance of a mentor, the participant will learn methods for single-cell sequencing and machine learning.

Mentor(s): The mentor for this opportunity is Adam Rivers (adam.rivers@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: May 15, 2024. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for two years, but may be renewed upon recommendation of ARS and is contingent on the availability of funds.

Level of Participation: The appointment is full time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. **Anticipated stipend range is \$86,000-\$90,000.**

Citizenship Requirements: This opportunity is available to U.S. citizens, Lawful Permanent Residents (LPR), and foreign nationals. Non-U.S. citizen applicants should refer to the [Guidelines for Non-U.S. Citizens Details page](#) of the program website for information about the valid immigration statuses that are acceptable for program participation.

ORISE Information: This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and ARS. Participants do not become employees of USDA, ARS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

Questions: Please visit our [Program Website](#). After reading, if you have additional questions about the application process, please email ORISE.ARS.Southeast@oraui.org and include the reference code for this opportunity.

Qualifications The qualified candidate should have received a doctoral degree in the one of the relevant fields within the past 5 years, or be currently pursuing a doctoral degree anticipated to be received by the start of the appointment.

Preferred skills:

- Experience in microbiology and cell biology
- Experience with RNAseq

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- Experience with bioinformatics tools for molecular biology
- We recognize that everyone has a unique mix of skills and welcome applications from anyone who has an established track record of productivity in microbiology or cell biology.

Eligibility

- **Degree:** Doctoral Degree.

Requirements

- **Academic Level(s):** Graduate Students or Postdoctoral.

- **Discipline(s):**

- **Chemistry and Materials Sciences** ([1](#))
- **Computer, Information, and Data Sciences** ([17](#))
- **Earth and Geosciences** ([21](#))
- **Engineering** ([1](#))
- **Environmental and Marine Sciences** ([14](#))
- **Life Health and Medical Sciences** ([51](#))
- **Mathematics and Statistics** ([11](#))

Affirmation I affirm that:

- I am a US Citizen, OR
- I am a non-US Citizen currently living in the United States