

Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in Comparative Chemosensory Genomics of Stored Product Insects
Opportunity Reference Code: USDA-ARS-SCINet-2024-0299

Organization U.S. Department of Agriculture (USDA)

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How to Apply *To submit your application, scroll to the bottom of this opportunity and click **APPLY**.*

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.

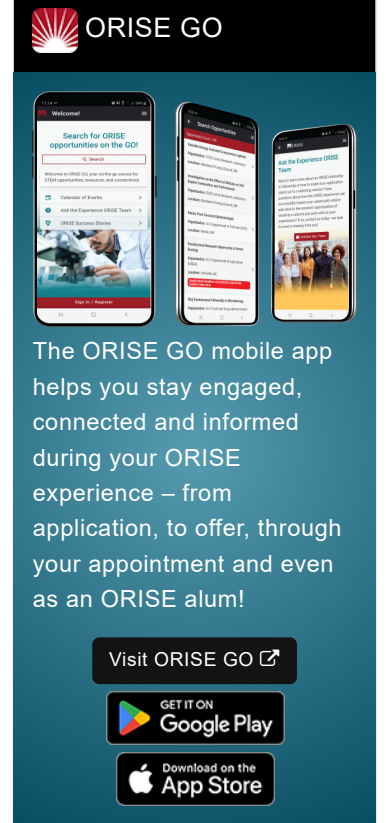
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Application Deadline 7/31/2025 3:00:00 PM Eastern Time Zone

Description **ARS Office/Lab and Location:** A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Stored Product Insect and Engineering Research Unit in Manhattan, Kansas.

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: The SCINet/Big Data Research Participation Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in solving agriculture-related problems at a range of spatial and temporal scales, from the genome to the continent, and sub-daily to evolutionary time scales. One of the goals of the SCINet Initiative is to develop and apply new technologies, including artificial intelligence (AI) and machine learning, to help solve complex agricultural problems that also depend on collaboration across scientific disciplines and geographic locations. In addition, many of these technologies rely on the synthesis, integration, and analysis of large, diverse datasets that benefit from high-performance computing (HPC) clusters. The objective of these fellowships

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is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each applicant and amenable to or requiring the HPC environment. Training will be provided in data science, scientific computing, AI/machine learning, and related topics as needed for the fellow to complete their research.

Stored product insects are an evolutionarily diverse group of organisms that are attracted to similar food volatiles, yet very little is known about the identity or function of the chemosensory receptors that these insects use to detect the odors of potential food resources. Better knowledge of the underlying genetics and physiology of chemoreception in pest insect species could lead to novel control methods to reduce the approximately \$2.5 billion dollars of post-harvest losses to U.S. agriculture that these insects contribute to every year. Under the guidance of a mentor, the fellow will take part in comparative genomics analysis of chemosensory genes in stored product beetle genomes to determine whether convergent adaptations in closely related taxa primed these insects for attraction to similar pheromones and food volatiles. The fellow will have access to genomes of 15 stored product insect species for this project, accompanying RNA-Seq data, and the ability to generate new population resequencing data, RNA-Seq data, or de novo genome assemblies to address this topic. Chemosensory genes are inherently difficult to predict and annotate due to their unconventional gene structure with long introns and short exons. The fellow will also have the ability to explore new machine learning algorithms to predict protein-coding sequences and substrate preferences. The fellow will also collaborate with members of the USDA ARS Ag100Pest team to apply these tools to the genomes of other pest insects that have been sequenced by the USDA. (Ag100Pest is an initiative to sequence the genomes of over 100 economically important pest insect species.)

Learning Objectives: The participant will learn about processes and procedures for analyzing high-throughput sequencing data, including genome assembly, RNA-Seq analysis of complete samples, ab initio gene prediction, and population genetics analysis. Skills in Python, R, and the Unix command line will be emphasized, and leadership and collaborative skills will be learned through participation in SCINet working groups and participating in collaborative research. In addition to gaining experience with publishing peer-reviewed papers and presenting research for a scientific audience, the fellow will also have the opportunity to take self-paced online courses to learn and improve their skills in R, Python, or other data analysis tools.

Mentor(s): The mentor for this opportunity is Erin Scully at Erin.Scully@usda.gov. If you have questions about the nature of the research, please contact the mentor.

Anticipated Appointment Start Date: Prefer 2024, but start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year but

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may be renewed for a second year upon recommendation of the mentor and ARS.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant(s) will receive a monthly stipend commensurate with educational level and experience.

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](#). If you have additional questions about the application process please email ORISE.ARS.SCINet@ornl.gov and include the reference code for this opportunity.

Qualifications The qualified candidate should be currently pursuing or have received a doctoral degree in the one of the relevant fields.

Preferred skills:

- Experience in bioinformatics/computational biology
- Experience developing, testing, and refining machine learning models
- Experience developing HPC workflows.
- Excellent written and oral communication skills.
- Experience in a team and collaborative scientific environments.
- Ability to publish results in peer-reviewed scientific journals.

Eligibility Requirements

- **Degree:** Doctoral Degree.
- **Discipline(s):**

- **Life Health and Medical Sciences** ([12](#) )

Affirmation I affirm that:

I am a US Citizen, OR;

I am a non-US citizen currently living in the United States