

Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in Computational Design of Insecticidal Molecules and Genetic Control Systems

Opportunity Reference Code: USDA-ARS-SCINet-2025-0149

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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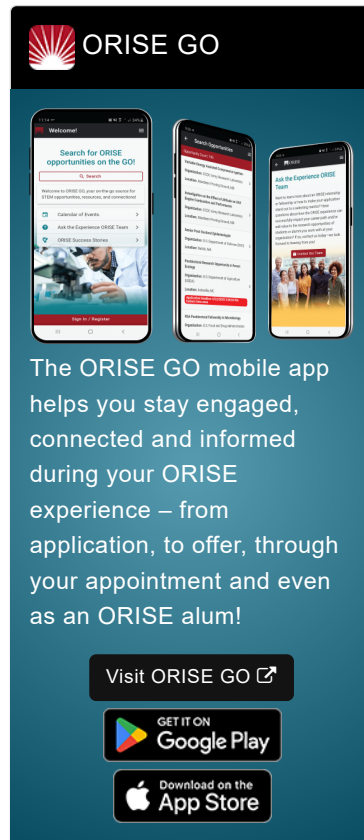
Application Deadline 1/1/2026 3:00:00 PM Eastern Time Zone

Description *Applications are reviewed on a rolling-basis.

ARS Office/Lab and Location: A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), San Joaquin Valley Agricultural Sciences Center, located at Parlier, 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.


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


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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 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.

Research Project: This research project focuses on molecular design and genetic manipulation for controlling major pests of high-value crops, including tree crops. In the molecular design track, the Fellow, under the guidance of a mentor, will create RNA- and peptide-based insecticidal molecules utilizing genomic and transcriptomics datasets generated by the host laboratory. To develop insecticidal molecules, the Fellow will utilize AI/machine learning, structural and computational biology, bioinformatics, and genomics tools. The gene editing track will focus on developing efficient delivery systems and mutating key genetic targets in pest species. This research will employ a wide array of skills including, but not limited to, big data mining, protein structure and function prediction, protein-ligand interaction, molecular modeling, molecular toxicology, workflow development, gene knockout design and optimization, and genetic transformation techniques.

Learning Objectives: The Fellow will have the opportunity to learn about USDA-ARS SCINet computing resources (scinet.usda.gov) and will contribute to committees, initiatives, or workshops established by the SCINet Protein Function and Phenotype Prediction Working Group as well as the Arthropod Genomics Working Group. The Fellow will engage in technology transfer through presentations and virtual trainings offered through ARS's SCINet initiative. Throughout the course of this research project, the Fellow will have the opportunity to gain experience in multidisciplinary research on developing innovative management strategies for insect and plant pathogen pests associated with fresh and stored horticultural commodities.

Mentor(s): The mentor for this opportunity is Raman Bansal, Commodity Protection and Quality Research Unit, (raman.bansal@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: February 2026. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year 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

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commensurate with educational level and experience. **The current stipend range for this opportunity is \$90,000 - \$100,000/year plus a supplement to offset a health insurance premium.**

Citizenship Requirements: s opportunity is available to U.S. citizens and Lawful Permanent Residents (LPR) only.

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@orau.org 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 developing, testing, and refining machine learning models.
- Experience leveraging AlphaFold2 to generate high-accuracy protein models and structural insights.
- Experience engineering nucleic acid sequences and chemistries to optimize specificity, stability, and delivery to arthropod systems.
- Expertise in molecular biology including insect transformation and mutagenesis.
- Experience in project support and team collaboration in a multi-lab consortium setting.
- Excellent communication skills as evidenced by first-author peer-reviewed publication(s).

Stipend \$90,000.00 – \$100,000.00 Yearly

- Eligibility Requirements**
- **Citizenship:** LPR or U.S. Citizen
 - **Degree:** Doctoral Degree.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#))
 - **Computer, Information, and Data Sciences** ([17](#))
 - **Earth and Geosciences** ([21](#))
 - **Engineering** ([27](#))
 - **Environmental and Marine Sciences** ([14](#))
 - **Life Health and Medical Sciences** ([51](#))
 - **Science & Engineering-related** ([2](#))

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