Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship on the Use of AI and Molecular Engineering to Discover Novel Insecticidal Molecules
Opportunity Reference Code: USDA-ARS-SCINet-2023-0448

Organization	U.S. Department of Agriculture (USDA)
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How to Apply	***Connect with ORISE...on the GO!*** Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

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.
- Contact information of two educational or professional recommendations.

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

Application Deadline	5/10/2024 3:00:00 PM Eastern Time Zone
Description	**Applications will be reviewed on a rolling basis. Applicants are encouraged to apply as soon as possible, as application review will begin immediately. The position will remain open until a suitable candidate is found.**

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 delivers 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 ensures 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.

Research Project: The research is primarily aimed at discovering novel molecules targeting major pests of high-value crops including tree nuts and fresh fruits. The Fellow is expected to design RNA- and peptide-based insecticidal molecules using several 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 Fellow will have the opportunity to perform initial validation of designed molecules through laboratory bioassays. 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, etc. The Fellow will also contribute towards improving genome and transcriptome assemblies and analyze gene expression data.

Learning Objectives: The Fellow will have the opportunity to learn about USDA-ARS SCINet computing resources (scinet.usda.gov) and is expected to 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 is expected to engage in technology transfer through presentations and virtual trainings offered through the ARS Big Data Initiative and SCINet. 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.

USDA-ARS Contact: If you have questions about the nature of the research, please contact Raman Bansal at the Commodity Protection and Quality Research Unit (raman.bansal@usda.gov).

Anticipated Appointment Start Date: The 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 for a second year upon recommendation of the mentor and ARS.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. **The current stipend for this opportunity is $85,000 - $95,000 per year.**

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 page 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

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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 have received a doctoral degree in one of the relevant fields or be currently pursuing the degree with completion by start of appointment. Degree must have been received within the last five years.

Preferred skills:

- Experience developing, testing, and refining machine learning models.
- Experience leveraging AlphaFold(2) to generate high-accuracy protein models and structural insights.
- Experience engineering nucleic acid sequences and chemistries to optimize specificity, stability, delivery to biological systems.
- Expertise in assembling and scaffolding genomes using short and long read sequencing data.
- Experience in project coordination and team collaboration in a multi-lab consortium setting.
- Excellent communication skills as evidenced by first-author peer-reviewed publication(s).

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (1 👁)
  - **Engineering** (1 👁)
  - **Life Health and Medical Sciences** (6 👁)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).