

Opportunity Title: USDA-ARS Computational Protein Chemistry/Molecular Biology Postgraduate Research Fellowship

Opportunity Reference Code: USDA-ARS-SEA-2024-0225

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SEA-2024-0225

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 9/13/2024 3:00:00 PM Eastern Time Zone

Description *Applications are reviewed on a rolling-basis.

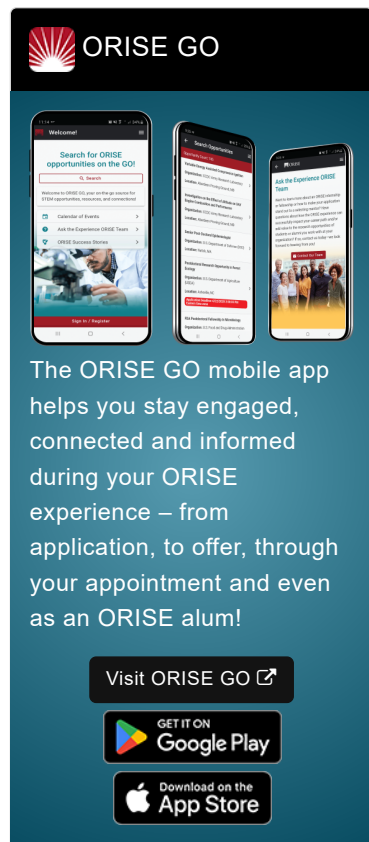
ARS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Protein Engineering and Molecular Biology Research is available within the Food Processing and Sensory Quality (FPSQ) Unit in New Orleans, Louisiana.

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 research will focus on modeling and characterizing the interactions between food allergens and antibodies that cause food allergies. Preference will be given to applicants with demonstrated experience in protein modeling, protein engineering, protein chemistry, molecular simulation, machine learning, or bioinformatics. Experience using Molecular Operating Environment (MOE), Chimera, Schrodinger Biologics Suite, or similar software for protein modeling and Nanoscale Molecular Dynamics (NAMD), or similar software, for molecular dynamics simulations




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is preferred.

The selected participant will be a part of a research team that conducts basic and applied research to characterize food allergen structure. The overall objective is to leverage modeling and molecular simulation to identify unique features of peanut and tree nut allergens. The applicant will apply their chemical biology, chemical computing, computational biology, protein engineering, molecular biology, or biochemistry knowledge to learn and apply molecular biology concepts to characterize immunoglobulin-E (IgE) binding to food allergens.

- Use appropriate computer modeling software to perform computational analysis and molecular simulation of allergen-antibody interaction/docking
- Intellectually participate in all phases of a program to characterize the chemical, biochemical, and molecular biological characteristics of seed storage protein allergens from peanuts and tree nuts by productively interacting with the lead scientist
- Utilizes computer and appropriate software to collect, handle, analyze, and store data for the evaluation of the validity and significance of experiments and molecular simulations
- Maintain detailed records of all research activities
- Gain skills in manuscripts and reports for publication

Learning Objectives:

- Develop an understanding of the sequence and structural characteristics of peanut and tree nut allergens,
- Identify how food processing may alter allergen structure and potency, and
- Identify rational targets for allergen mutagenesis that can reduce allergen potency.

Mentor: The mentor for this opportunity is Christopher P. Mattison (Chris.Mattison@usda.gov). If you have questions about the nature of the research, please contact the mentor.

Anticipated Appointment Start Date: August 2024. 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 commensurate with educational level and experience. **Current stipend is \$72,553 annually with a health insurance supplement.**

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](#)

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[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@orau.org and include the reference code for this opportunity.

Qualifications The qualified candidate should be pursuing or have received a doctoral degree in one of the relevant fields (i.e. chemical biology, chemical computing, computational biology, protein engineering, molecular biology, biochemistry. Degree must have been received within the past five years or anticipated to be received by December 31, 2024.

- Eligibility Requirements**
- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 12/31/2024 11:59:00 PM.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([2](#) )
 - **Computer, Information, and Data Sciences** ([2](#) )
 - **Life Health and Medical Sciences** ([10](#) )
 - **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).