

**Opportunity Title:** USDA-ARS Research Opportunity in Food Chemistry & Molecular Biology

**Opportunity Reference Code:** USDA-ARS-2021-0221

**Organization** U.S. Department of Agriculture (USDA)

**Reference Code** USDA-ARS-2021-0221

**How to Apply** *Connect with ORISE...on the GO!* Download the new ORISE GO mobile app in the Apple 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. All transcripts must be in English or include an official English translation. 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.

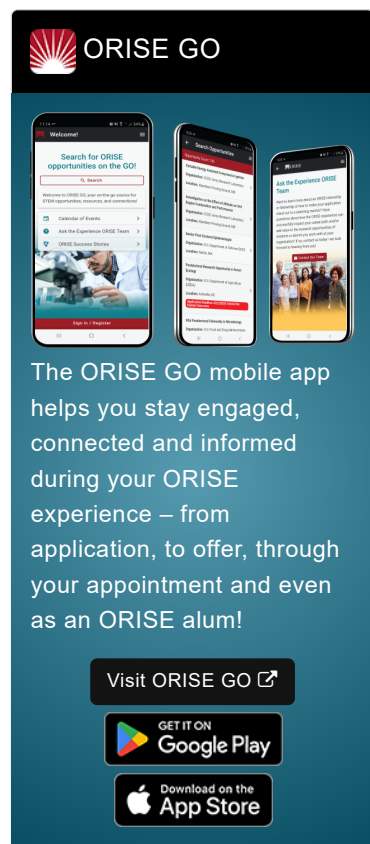
**Description** \*Applications may be reviewed on a rolling-basis and this opportunity will remain open until filled.

**ARS Office/Lab and Location:** A research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Southern Regional Research Center (SRRC), Food Processing and Sensory Quality (FPSQ) Unit located 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 participant will be involved with a research team that conducts basic and applied research to characterize food allergens including cashew and pecan nut allergens. The overall objective is to use this information to enable commercial methods that can reduce or eliminate the allergenic properties of allergens and enable assay development to improve allergen detection. Under the guidance of a mentor, the participant will be involved in the following activities:

- Perform proximate analysis (protein, lipid, ash, moisture, carbohydrate) and fatty acid analysis of nut and food samples
- Participate in all phases of a program to characterize the chemical, biochemical, and molecular biological characteristics of seed storage protein allergens from cashew and pecan nuts by productively interacting with the lead scientist and performing a variety of laboratory and field experiments.
- Purify or synthesize reagents of interest that can be used in a variety of immunoassays to characterize and/or disrupt IgE binding to food allergens



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- Develops and conducts in vitro and in vivo studies to characterize allergens and allergen extracts.
- Conduct experiments for separation and identification of native and recombinant allergens from foods, plants, insects, or bacteria using a variety of chromatography procedures, including LPLC, that can be used to characterize cross-reaction among allergens.
- Conduct a variety of standard molecular biology techniques including: DNA cloning, DNA and RNA extraction, PCR and qRT-PCR, protein analysis (gel electrophoresis, western blot, immunohistochemistry, ELISA).
- Utilizes computer and appropriate software to collect, handle, and analyze data for the evaluation of the validity and significance of experiments conducted in the laboratory.
- Maintain detailed records of all research activities
- Author or co-author manuscripts and reports for publication

**Learning Objectives:** During the ORISE appointment, the participant will learning the following:

- How food processing affects allergen potency
- An understanding of the sequence and structural characteristics of food allergens
- Familiarity with protein enrichment or purification procedures for recombinant and/or native food allergens

**Mentor(s):** The mentor for this opportunity is Chris Mattison ([chris.mattison@usda.gov](mailto:chris.mattison@usda.gov)). If you have questions about the nature of the research please contact the mentor(s).

**Anticipated Appointment Start Date:** As soon as a qualified candidate is identified. 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. **An annual stipend up to \$58,842 and a health insurance supplement of \$5,679/year will be provided.**

**Citizenship Requirements:** This opportunity is available to U.S. citizens 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](#). After reading, if you have additional questions about the application process please email [USDA-ARS@ornl.gov](mailto:USDA-ARS@ornl.gov) and include the reference code for this opportunity.

**Qualifications** The qualified candidate should have received a bachelor's, master's or doctoral degree in one of the relevant fields. Preference will be given to those Doctoral or Master's, but applicants with a Bachelor's degree and experience relevant to the opportunity will be given fair consideration.

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Preferred skills:

- Experience in proximate analysis (protein, moisture, ash, lipid content, and fatty acid analysis) of foods
- Experience using the following (or similar) instruments and methods: Virtis Freezemobile 12ES freeze-dryer, Lindberg/Blue muffle oven, desiccator, fatty acid analysis, Dionex ASE 350 accelerated solvent extractor, ASE 350, RapidVAP (Labconco) vacuum evaporation system, and a LECO FP628.
- Ability to apply food science/food chemistry methods
- Willingness to learn new molecular biology techniques to characterize immunoglobulin-E (IgE) binding to food allergens, processing induced changes in allergens using immunoassay, and other food allergen properties.

**Eligibility Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** ([2](#) 👁)
  - **Life Health and Medical Sciences** ([46](#) 👁)