Opportunity Title: Postdoctoral Research Opportunity in Nanobiosensing Techniques
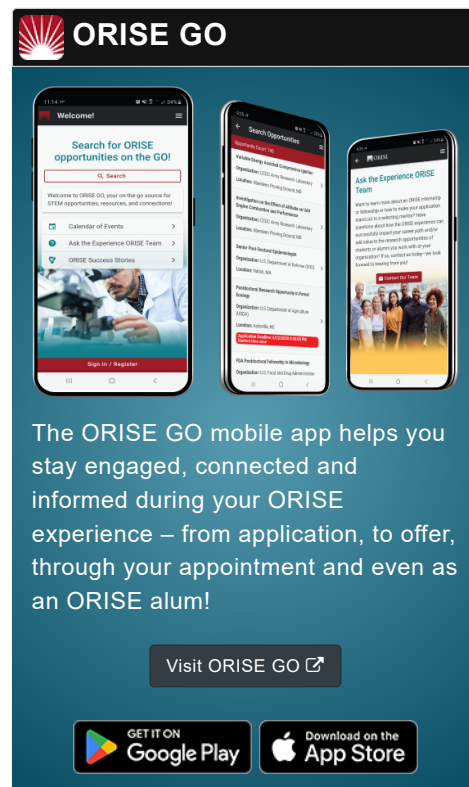**Opportunity Reference Code:** ARS-QSARU-2018-126-0013-02

Organization	U.S. Department of Agriculture (USDA)
Reference Code	ARS-QSARU-2018-126-0013-02
How to Apply	A complete application consists of:

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- An application
- Transcripts – 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.

If you have questions, send an email to USDA-ARS@orau.org. Please include the reference code for this opportunity in your email.

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Description

A postdoctoral research opportunity is available with the the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) in the Quality and Safety Assessment Research Unit (QSARU) in Athens, Georgia.

The aim of the project is to develop nanobiosensing technique to detect foodborne pathogens and toxins using surface plasma resonance imaging (SPRi), specifically, determine SPR characteristics of Salmonella and Shiga toxin-producing Escherichia coli (STEC); develop chemometric models to differentiate Salmonella and STEC from other bacteria; classify different Salmonella and STEC serotypes and strains; and evaluate detection limits of label-free nanobiosensor.

To accomplish this project, we will develop methodologies to test and validate the label-free SPRi technique. A series of experiments will be conducted based on the following methods: 1) Design, fabricate SPRi sensor chips with antibodies and aptamers to optimize for lower detection limits; 2) Prepare Salmonella and STEC samples; 3) Acquire SPRi data from Salmonella and STEC; 4) Test and validate classification models for different serotypes and strains of Salmonella and STEC; 5) Test detectability from different background microflora; 6) Fabricate high-throughput prototype for food sample measurements

The participant will learn micro- and nano-scale sensing technology for foodborne pathogen and toxin detection. Specifically, learn protocol and process to develop biosensor(s) for high-throughput detection of bacteria from food matrices.

The participant will have opportunity to learn understanding

federal food safety program and research priority to prevent and
protect foodborne outbreaks.

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. The
initial appointment is for one year to start in January 2019, but
may be renewed upon recommendation of ARS and is contingent
on the availability of funds. The participant will receive a monthly
stipend commensurate with educational level and experience.
Proof of health insurance is required for participation in this
program. The appointment is full-time. Participants do not
become employees of USDA, ARS, DOE or the program
administrator, and there are no employment-related benefits.

While participants will not enter into an employment relationship
with ARS, this position requires a pre-appointment check and a
full background investigation.

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.

For more information about the ARS Research Participation
Program, please visit the **Program Website**.

Qualifications	To be eligible, applicants should have a PhD in Physical Chemistry, Analytical Chemistry, Nanotechnology, Food Science.

The skills for this project includes single-molecule analysis using
atomic force microscopy (AFM), kinetic theories, molecular
mechanics, and surface characterization techniques such as
surface plasmon resonance (SPR), and scanning electron
microscopy (SEM).

**Eligibility
Requirements**

- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (2 👁)
  - **Engineering** (1 👁)
  - **Life Health and Medical Sciences** (1 👁)
  - **Physics** (1 👁)
  - **Science & Engineering-related** (1 👁)