Opportunity Title: Novel Systems for Detection of Fungal Toxins
Opportunity Reference Code: ARS-MPAMRU-2016-0048-02

Organization	U.S. Department of Agriculture (USDA)
Reference Code	ARS-MPAMRU-2016-0048-02
How to Apply	A complete application package 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. Selected candidate must provide proof of completion of the degree before the appointment can start. Proof must be sent to ORISE directly from the academic institution including graduation date and degree awarded. All transcripts must be in English or include an official English translation.
- A current resume/CV

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

Description   The participant will conduct research to improve methods for detecting fungal toxins (mycotoxins). This will be pursued through the development of multiplexed biosensors for mycotoxins. Specifically, application of analytical devices based on the principles of surface plasmon resonance or biolayer interferometry to the simultaneous detection of multiple toxins in commodities and foods. The participant will also evaluate the ability of assays to detect related plant or fungal metabolites commonly known as "masked" mycotoxins. Multiplexed biosensors are based upon a variety of materials such as antibodies or aptamers. The participant will evaluate new materials for their performance in mycotoxin detection systems and, where possible, participate in the generation of novel toxin-binding materials such as recombinant antibodies or aptamers. Existing materials, previously developed within the research unit, as well as commercially available materials and materials developed by the participant will be used to complete these objectives. The participant is expected to plan and conduct experiments; analyze, evaluate and interpret the results; and prepare reports of the results in the form of manuscripts for publication in peer-reviewed journals and presentations at scientific meetings.

The participant will conduct research under the supervision of a Lead Scientist, who is responsible for the scientific and technical aspects of the research project. Guidance will be provided by the supervisor and will consist primarily of defining research problems, guidance in planning experiments, and review and discussion of results within the context of team research goals. Colleagues and collaborators will be consulted as needed.

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Results in manuscripts will be reviewed by the supervisor. In addition, appropriate colleagues will be chosen with whom to review and discuss results and manuscripts. Manuscripts will be submitted to the Research Leader for administrative review and approval.

The appointment is full-time for one year and may be renewed based upon recommendation of the ARS and availability of funding. The selected applicant will receive a stipend as support for their living and other expenses during this appointment. Stipend rates are determined by ARS officials, and are based on the applicant's academic and professional background. The participant must show proof of health and medical insurance. Health insurance can be obtained through ORISE. The participant will not enter into an employee/employer relationship with ORISE, ORAU, USDA, ARS, or any other office or agency. Instead, the participant will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.

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 must have received a postgraduate degree (Ph.D. or equivalent) in an area related to bioanalytical chemistry, analytical chemistry, protein engineering, or synthetic biology within five years of the desired starting date.

The participant should have practical laboratory-based skills in conducting analyses of small molecules using biosensors or immunoassays. Experience with the deveopment and application if immunoassays, or related technologies based upon aptamers, is desirable. Experience with multiplexed sensor formats would be beneficial. The ultimate goal of this research is to provide improved methods for detecting small molecule toxins in foods, so experience handling toxins and experience with analysis of foods would be beneficial. Because this research deals with toxic materials, the ability to conduct laboratory work in a safe manner is essential. Improvements to toxin detection assays will require evaluation of toxin-binding materials and may require the development of new materials. For this reason, skill

and/or experience in the development of novel binding materials for small molecules would be beneficial. For example, experience with traditional or recombinant antibody production, or aptamer selection would be favorable. The participant is expected to plan and conduct experiments; analyze, evaluate and interpret the results; and prepare reports of the results in the form of manuscripts for publication in peer-reviewed journals and presentations at scientific meetings. Therefore, demonstrated proficiency in such activities (in the form of peer-reviewed publications, and/or presentations) is desirable.

Eligibility Requirements

- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (5 👁)
  - **Engineering** (1 👁)
  - **Life Health and Medical Sciences** (8 👁)