

Opportunity Title: USDA-ARS Postdoctoral Fellowship in Intestinal Immunology

Opportunity Reference Code: USDA-ARS-2022-0173

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2022-0173

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A complete application consists of:

- 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.

Application Deadline 9/30/2022 11:59:00 PM Eastern Time Zone

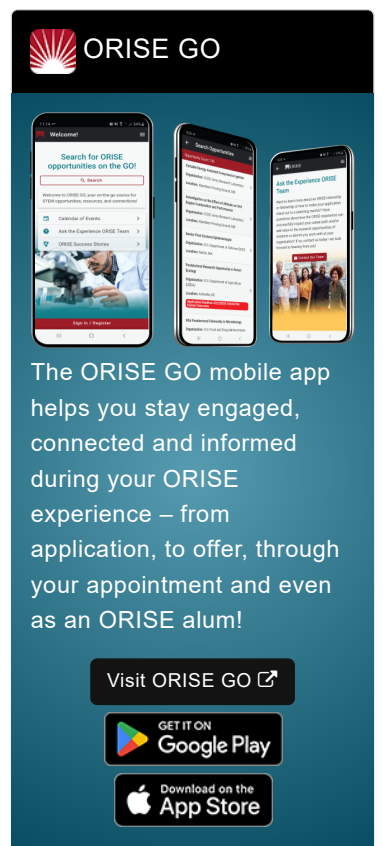
Description *Applications are reviewed on a rolling-basis and this posting could close before the deadline.

ARS Office/Lab and Location: A postdoctoral research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) National Animal Disease Center (NADC) located in Ames, Iowa.

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 Food Safety and Enteric Pathogens Research Unit (FSEPRU) at the NADC, located in Ames, IA, ARS National Program 108-Food Safety performs basic and applied research to characterize and employ pre-harvest strategies to control human food-borne pathogens. The long-term objective of this research is to reduce food-borne pathogen (*Salmonella*) carriage in swine, and develop non-antibiotic intervention strategies to improve intestinal homeostasis and limit the need for antibiotics. The participant will be part of a multi-disciplinary team (immunology/physiology, microbial ecology, and microbiology) to identify and develop approaches to limit colonization of pigs with foodborne *Salmonella* and evaluate novel intervention strategies.

The participant's specific project will involve assessing the impact of *Salmonella* carriage on swine immune response, with an emphasis on antigen-presenting cells in the intestine, tonsil, and lymph nodes. The participant will utilize both *in vitro* and *in vivo* techniques, including cell culture, single-cell RNA-sequencing (scRNA-seq), and immunohistochemistry to investigate responses of specific cell types to *Salmonella*. In addition, the ability to limit *Salmonella* infection will be explored.



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Learning Objectives:

- In consultation with a computational biologist, interrogate scRNA-seq datasets to identify cell-specific response to *Salmonella*.
- The participant will derive various antigen-presenting cells (dendritic cells/macrophages) and assess response to *Salmonella* with the goal of identifying pathways to activate bacterial killing.
- Utilize flow cytometry to understand the impact of *Salmonella* infection on antigen-presenting cell functions.
- Identify cell types in lymphoid tissues harboring *Salmonella* using immunohistochemistry, and respective response of cells using in-situ hybridization techniques.
- Participate in workshops on interrogating single-cell transcriptomic data and techniques used to analyze datasets.
- Communicate research findings at conferences in both oral and poster presentations.
- The participant will get a better overall understanding of research through attendance of laboratory meetings when lab members share data and writing manuscripts on their respective project.

Mentor(s): The mentor for this opportunity is Crystal Loving (crystal.loving@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 has been 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.

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](#) 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 USDA-ARS@ornl.gov 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

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currently pursuing the degree with completion by the end of August 2022. Degree must have been received within the past five years.

Preferred skills:

- Experience with in vitro culture systems (primary or cell lines) and isolation of cells from blood or tissues
- Basic understanding of pathogen-host interactions that may impact host immune status
- Experience with RNA extraction and analysis of host transcriptomic data

**Eligibility
Requirements**

- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 8/31/2022 11:59:00 PM.
- **Discipline(s):**
 - **Life Health and Medical Sciences** ([10](#) )
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).