Opportunity Title: USDA-ARS Fellowship in Influenza A Virus in Swine Phylogenetics
Opportunity Reference Code: USDA-ARS-MW-2023-0194

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-MW-2023-0194

How to Apply ***Connect with ORISE...on the GO!*** Download the new ORISE GO mobile app in the Apple App Store 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. 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 7/7/2023 3:00:00 PM Eastern Time Zone

Description ***Applications will be reviewed on a rolling-basis.**

ARS Office/Lab and Location: A research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), National Animal Disease Center, Virus and Prion Research Unit, located in Ames, Iowa. For an introduction to the Flu crew at the National Animal Disease Center, please see: https://youtu.be/kOJy8tFTuiI

About Us: 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 selected participant will be involved in studying the evolutionary dynamics of influenza A virus (IAV) in swine. This project is within the Intervention Strategies to Control Endemic and New and Emerging Influenza A Virus Infections in Swine project in the Virus and Prion Research Unit. Scientists in this unit maintain a comprehensive IAV research program including investigation of virulence mechanisms, vaccinology, immunology, and virus evolution. The participant will be based on the National Centers for Animal Health campus and enjoy interactions with a dynamic community of ARS intramural scientists, postdoctoral fellows, graduate students, and research technicians.

Under the guidance of a mentor, the participant will use a range of

phylogenetic methods (including Bayesian) to study how interspecies transmission, genomic reassortment, and farm production practices affect the evolution of endemic viruses and the emergence of novel influenza viruses with pandemic potential in swine. Using the data provided by the USDA Influenza A virus in swine passive surveillance system: genetic evolution of IAV from swine will be quantified; genetic predictors of influenza host range and virulence will be identified; the genetic and antigenic variability of endemic viruses will be studied; and epidemiologic patterns as swine IAV is transmitted among hosts and across landscapes will be quantified. An additional goal is the development of novel algorithms, bioinformatic tools or analytical pipelines that quantify the diversity of RNA viruses infecting swine that may be deployed in online databases or interactive websites.

Learning Objectives: The participant will learn HPC computing technologies and techniques in genomic epidemiology and machine learning to quantify drivers of IAV evolution in swine using data generated from IAV surveillance in human and swine populations. The participant will have the opportunity to collaborate with multiple USDA ARS scientists and investigators within the University of Pennsylvania Center for Excellence in Influenza Research and Response (CEIRR) as part of the NIH NIAID CEIRR collaborative network (https://www.ceirr-network.org/centers/penn-ceirr). The participant will have the opportunity to attend local and/or national meetings and will be supported and encouraged to publish research dealing with the evolution and pandemic potential of swine IAV.

USDA-ARS Contact: The mentor for this opportunity is Tavis Anderson (tavis.anderson@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: August 2023. 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 the mentor and ARS, and is contingent on the availability of funds.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant(s) 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

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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. If you have additional questions about the application process please email ORISE.ARS.Midwest@orau.org and include the reference code for this opportunity.

Qualifications

The qualified candidate(s) should be pursuing a doctoral degree in computer science.

Preferred skills:

- Experience in computer science, bioinformatics, or computational biology
- Proficiency in at least one programming language (e.g., python, R, bash, perl)
- Experience in phylogenetic methods and algorithms
- Strong oral and written communication skills
- Ability to effectively collaborate and work with others

Eligibility Requirements

- **Degree:** Currently pursuing a Doctoral Degree.
- **Overall GPA:** 3.00
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Mathematics and Statistics** (11 👁)