

Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in Comparative Genomics of Insect-Killing Fungi
Opportunity Reference Code: USDA-ARS-SCINet-2023-0284

Organization U.S. Department of Agriculture (USDA)

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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 10/25/2023 3:00:00 PM Eastern Time Zone

Description *Applications will be reviewed on a rolling-basis and the appointment could be filled before the application deadline.

ARS Office/Lab and Location: A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), located in Ithaca, New York.

The U.S. Department of Agriculture - Agricultural Research Service (USDA ARS) mission involves problem-solving research in the widely diverse food and agricultural areas encompassing plant production and protection; animal production and protection; natural resources and sustainable agricultural systems; nutrition; and food safety and quality. The programs are conducted in 46 of the 50 States as well as U.S. Territories (Puerto Rico, and the U.S. Virgin Islands). For ARS to maintain its standing as a premier scientific organization, major investments in computing, networking, and storage infrastructure are required. Training in data and information management are integral to the integrity, security, and accessibility of research findings, results, and outcomes within the ARS research enterprise. Nearly 2000 scientists and postdoctoral fellows conduct research within the ARS research enterprise.

Research Project: The SCINet/Big Data Research Participation Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in solving agriculture-related problems at a range of spatial and temporal scales, from the genome to the ecosystem, and sub-daily to evolutionary time scales. One of the goals of the SCINet Initiative is to develop and apply new technologies, including AI and machine learning, to help solve complex agricultural problems that also depend on



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collaboration across scientific disciplines and geographic locations. In addition, many of these technologies rely on the synthesis, integration, and analysis of large, diverse datasets that benefit from high performance computing (HPC) clusters. The objective of this fellowship is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to the applicant and amenable to or requiring the HPC environment. Training will be provided in data science, scientific computing, AI/machine learning, and related topics as needed for the fellow to complete their research.

This research project will present multiple opportunities for the participant to apply and expand their bioinformatics skillset. This research will support and enhance the USDA-ARS collection of entomopathogenic fungi (ARSEF): the world's largest collection of entomopathogenic fungi. The participant will develop comparative genomics pipelines to investigate protein and chemical repertoires of diverse insect-killing fungi. This project will be conducted in the broad context of fungal evolution, and will focus on 1) developing a pipeline for annotation, curation, and phylogenomic analysis of genomes of insect-killing fungi, including all sequenced genomes from the USDA-ARS collection of entomopathogenic fungi (ARSEF) and 2) developing datamining tools and machine learning approaches to identify genes with potential roles in virulence, including small, secreted cysteine-rich proteins (SSCPs) and secondary metabolite clusters.

Learning Objectives: This project will provide the participant an opportunity to learn about and develop skillsets in fungal evolutionary analysis, data management, database curation, collaboration among interdisciplinary groups, pipeline development and genomic applications of machine learning. The participant will also have the opportunity to develop new skills through external training opportunities geared toward mastery of relevant coding languages (e.g., R and Python), participation and leadership in agency-wide working groups, and improving project management skills as part of a dynamic research team.

Mentor(s): The mentor(s) for this opportunity are Dr. Brian Lovett; Lovett Lab; (Brian.Lovett@usda.gov) and Dr. Kathryn Bushley; Bushley Lab; (Kathryn.Bushley@usda.gov). Please contact the mentor(s) if you have questions about the nature of the research.

Anticipated Appointment Start Date: No later than June 1, 2024; 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 the mentor 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. The current stipend

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range for this opportunity is \$85,000 - \$95,000/year plus a supplement to offset a health insurance premium.

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 ORISE.ARS.SCINet@orau.org and include the reference code for this opportunity.

Qualifications The qualified candidate should have received their doctoral degree in one of the relevant fields or be currently pursuing the degree with completion prior to start of appointment.

Preferred Skills:

- Experience mining and curating sequence data from databases
- Experience developing HPC workflows, especially for genome annotation
- Experience applying phylogenomics algorithms
- Experience or training in mycology, particularly previous work on entomopathogenic fungi
- Experience developing novel bioinformatics methods and software
- Experience managing diverse sequencing data types
- Excellent written and oral communication skills
- Experience in team and collaborative scientific environments

Eligibility Requirements • **Degree:** Doctoral Degree.

- **Discipline(s):**
- **Communications and Graphics Design** ([1](#))
 - **Computer, Information, and Data Sciences** ([5](#))
 - **Life Health and Medical Sciences** ([7](#))