Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in AI-Driven Maize-Fungal Pathogen Genomics
Opportunity Reference Code: USDA-ARS-SCINet-2026-0372

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SCINet-2026-0372

How to Apply ***To submit your application, scroll to the bottom of this opportunity and click APPLY.***

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.

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Application Deadline 12/4/2026 3:00:00 PM Eastern Time Zone

Description **ARS Office/Lab and Location:** A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Corn Insects and Crop Genetics Research Unit, Ames, Iowa, and National Center for Agricultural Utilization Research, Peoria, Illinois.

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 delivers 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.

ARS's SCINet/Artificial Intelligence (AI) Center of Excellence Research Participation Program 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 continent, 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 (ML), to help solve complex agricultural problems that also depend on 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). The objective of these fellowships is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each applicant and amenable to or requiring HPC resources. Training will be provided in data science, scientific computing, AI/ML, and related topics as needed for the fellow to complete their research. Additional funds are available for supplies and travel essential for the fellow's research.

Research Project: Under the guidance of a mentor, you will participate in research on interactions between maize and agriculturally important fungal pathogens, initially emphasizing *Fusarium* and *Aspergillus* species. These fungi cause crop diseases and mycotoxin contamination, reducing agricultural productivity, grain quality, and food and feed safety. The research will integrate genome sequences, genetic variation, transcriptomic profiles, functional annotations, protein structures, molecular networks, and disease-resistance phenotypes. Artificial intelligence (AI), machine learning, and bioinformatics will connect genotypes with phenotypes and identify maize and fungal genes, alleles, variants, and genomic loci influencing disease resistance, pathogen virulence, toxin production, and host recognition.

You will have the opportunity to participate in the development and application of foundation models for fungal DNA and protein sequences. With ARS and external AI knowledge-holders, you will adapt long-context DNA language models to fungal genomes. These DNA-language models will support genome-wide prediction of variant effects across pathogen populations represented in USDA-ARS culture collections. Simultaneously, protein language models and structural methods will evaluate protein variation and predict maize–fungal protein interactions, connecting host and pathogen variation with disease outcomes and targeted disease- and mycotoxin-control strategies.

Learning Objectives: Under mentor guidance, you will develop experience in host–pathogen genomics by integrating crop and pathogen variation, gene expression, functional annotations, protein information, and disease-resistance phenotypes. You will gain experience applying AI, genomics, and bioinformatics, from foundational AI/ML concepts to hands-on application and optimization of DNA and protein language models, including models customized for fungal genomes.

Training will include crop and fungal RNA-seq analysis; integration of multi-omic and phenotypic data; protein-interaction and structure-based analyses; and population and comparative genomics to examine genetic diversity, selection, pangenome relationships, and functional conservation. You will also develop reproducible GPU- and CPU-based high-performance computing pipelines and package models and analytical methods as documented, reusable research software and community resources.

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You will be encouraged to participate in SCINet and AI Center of Excellence training, meetings, seminars, and professional-development activities. Opportunities may include contributing to scientific groups and collaborating with students and researchers applying computational genomics and AI methods.

USDA-ARS Mentor: If you have questions about the nature of the research, please contact Carson Andorf (carson.andorf@usda.gov) and Hye-Seon Kim (hyeseon.kim@usda.gov).

Anticipated Appointment Start Date: 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 for a second year upon recommendation of the mentor and ARS.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant(s) will receive a monthly stipend commensurate with educational level and experience. **The current stipend range for this opportunity is $100,000 - $110,000/year plus a supplement to offset health insurance costs.** Funding is also available to help offset relocation costs, if applicable.

Citizenship Requirements: This opportunity is available to U.S. citizens only.

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 be currently pursuing or have received a doctoral degree in the one of the relevant fields. Previous experience with both maize and fungal pathogens is not required. Candidates with strong computational backgrounds and an interest in applying artificial intelligence to agricultural genomics are encouraged to apply.

Preferred skills:

- Experience analyzing genomic, genetic, transcriptomic, or other biological datasets

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- Experience with sequence analysis, variant analysis, comparative genomics, or related computational genomics approaches
- Experience analyzing RNA-sequencing data
- Experience using Linux or Unix, and high-performance computing systems
- Experience with Python, R, or another scientific programming languages
- Experience with AI/ML approaches
- Familiarity with tools like BLAST, MMseqs, and multiple sequence alignments
- Knowledge of plant genetics, fungal biology, plant pathology, or related areas
- Familiarity with protein-structure prediction, protein–protein interaction analysis, or structural bioinformatics

Point of Contact Janeen

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (5 👁)
  - **Engineering** (1 👁)
  - **Life Health and Medical Sciences** (51 👁)
  - **Mathematics and Statistics** (3 👁)