

**Opportunity Title:** USDA-ARS Postdoctoral Fellowship in Comparative Genomics  
in Alfalfa

**Opportunity Reference Code:** USDA-ARS-2022-0094

**Organization** U.S. Department of Agriculture (USDA)

**Reference Code** USDA-ARS-2022-0094

**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. All transcripts must be in English or include an official English translation. 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** 3/28/2022 3:00:00 PM Eastern Time Zone

**Description** \*Applications may be reviewed on a rolling-basis.

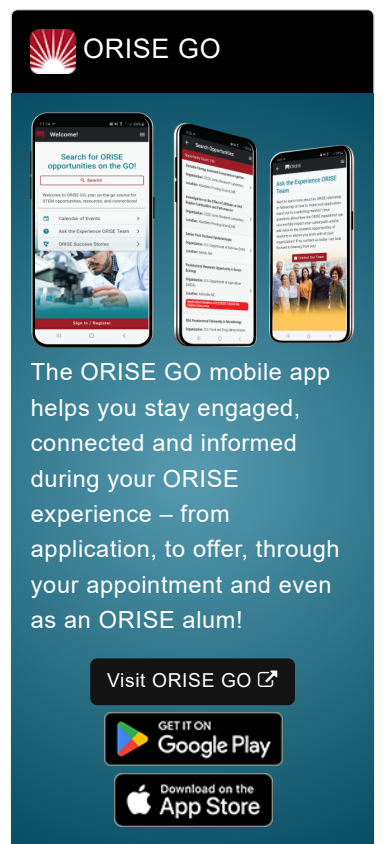
**ARS Office/Lab and Location:** A research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Plant Science Research Unit located in St. Paul, Minnesota.

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.

The mission of the Plant Science Research Unit at St. Paul, Minnesota is to develop new knowledge of the fundamental processes controlling energy content, crop yield, crop quality and use of alfalfa, soybean, oat and wheat; and to use this knowledge to develop germplasm and crop management schemes that increases farm profitability and sustainability.


**Research Project:** The participant will be involved in assembly and annotation of alfalfa genome sequences to identify the core and accessory genes and use RNA sequences to uncover allelic differential expression.


Genomic resources for alfalfa have lagged behind other crops due to the complex tetraploid nature of the alfalfa genome. Recent long read DNA sequencing methods have enabled assembly of alfalfa genomes. The participant will use sequences from 10 alfalfa genome assemblies to identify the core genome, investigate structural variation, and diversity in gene families, with emphasis on small secreted peptides, genes unique for fall dormancy, winter hardiness, and disease resistance. Comparisons of Iso-Seq and RNAseq data will be used to identify alternatively spliced genes, long




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non-coding RNAs, precursors of microRNAs, and tissue-specific isoforms.

The participant will also use bioinformatic methods in genome comparisons and collaborate on making genome resources available on public facing web sites. Research to map specific gene families such as disease resistance genes can also be carried out. It is anticipated that the participant will be the co-lead author on one or more publications describing the alfalfa genome and its expression.

**Learning Objectives:** The participant will learn to work with very large DNA data sets, utilize bioinformatic methods in comparative genomics, use data visualization methods, and uncover gene structure-function relationships in an important legume crop.

The appointment will provide opportunities for learning new bioinformatic programs through workshops and individual training, opportunities for developing new DNA analysis programs and pipelines, and experience in honing scientific writing and communication skills.

**Mentor(s):** The mentor for this opportunity is Deborah Samac ([debby.samac@usda.gov](mailto:debby.samac@usda.gov)). If you have questions about the nature of the research please contact the mentor(s).

**Anticipated Appointment Start Date:** April 2022. 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 up to two years 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](mailto:USDA-ARS@ornl.gov) and include the reference code for this opportunity.

**Qualifications** The qualified candidate should have recently received a doctoral degree in plant science, agronomy, plant genetics, or bioinformatics, or be currently pursuing the degree with completion by June 1, 2022.

Preferred skills:

- Skills in bioinformatics and working with large DNA sequence data sets
- Experience in genome assembly and annotation

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| <b>Eligibility</b>  | • <b>Degree:</b> Doctoral Degree.  |
| <b>Requirements</b> | • <b>Discipline(s):</b> <ul style="list-style-type: none"><li>◦ <b>Computer, Information, and Data Sciences</b> (<a href="#">1</a> 👁)</li><li>◦ <b>Life Health and Medical Sciences</b> (<a href="#">12</a> 👁)</li></ul> |