

**Opportunity Title:** USDA-ARS Postdoctoral Fellowship in Bioenergy

**Opportunity Reference Code:** USDA-ARS-2022-0104

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

**Reference Code** USDA-ARS-2022-0104

**How to Apply** **Connect with ORISE...on the GO!** Download the new ORISE GO mobile app in the Apple 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** 3/31/2022 3:00:00 PM Eastern Time Zone

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

**ARS Office/Lab and Location:** A postdoctoral research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Bioenergy Research Unit (BER) at the National Center for Agricultural Utilization Research (NCAUR) located in 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 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 Bioenergy Research Unit at the National Center for Agricultural Utilization Research (NCAUR) conducts a broad based program of microbial, biochemical, genetic, and fermentation engineering research that is international in scope and importance addressing national research needs for new environmentally acceptable agricultural practices and value-added products. The overall mission of the BER research program is to develop bioproducts and bioprocesses for conversion of agricultural commodities into biofuels and chemicals, enzymes and polymers.

**Research Project:** Agricultural residues, or lignocellulosic biomass, is a desirable, readily abundant feedstock for production of renewable fuels and value-added chemicals. Unfortunately, pretreatment technologies to release



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simple sugars from lignocellulosic materials commonly generates byproducts that are inhibitory to microorganisms. Brewer's yeast, *Saccharomyces cerevisiae*, is the most widely used organism in industrial fermentation processes and is a preferred organism for lignocellulosic feedstock utilization. However, *S. cerevisiae* demonstrates a significant lag in growth due to the impact of the lignocellulosic inhibitors and strains with greater tolerance to inhibitors are required. Haploid strains isolated through sporulation of an environmental *Saccharomyces* strain with good inhibitor tolerance demonstrate varied tolerance to inhibitors. Identifying the genetic basis for the differences in inhibitor tolerance within these haploid strains is the basis of this opportunity. Haploid strains isolated from *Saccharomyces* sp. strains demonstrating good inhibitor tolerance will be used for targeted mating and mass mating experiments. Haploid spores isolated from *Saccharomyces* strains will be tested for inhibitor tolerance in high content growth assays. Haploid mating assays will be followed by additional inhibitor tolerance testing. Strains with strong inhibitor tolerance will be further characterized using genomics/transcriptomics and bioinformatics skills to uncover genetic determinants leading to greater inhibitor tolerance in *Saccharomyces*.

**Learning Objectives:** The participant will expand their scientific repertoire and combine this with previous knowledge in genetics and bioinformatics to uncover the longstanding issues of inhibitors limiting the use of lignocellulosic biomass. They will gain expertise in the genetic and biochemical basis of lignocellulosic inhibitor tolerance in yeast. Further, the participant is encouraged to interact with scientists within the Bioenergy Research Unit as well as other research units at NCAUR. The objective of this learning experience is to prepare the participant to be a competitive candidate with the necessary independent and collaborative skills to successfully contribute to the next generation of research scientists.

**Mentor(s):** The mentor for this opportunity is Jeff Mertens ([Jeffrey.mertens@usda.gov](mailto:Jeffrey.mertens@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 is 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 an additional year 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. **The participant will receive an annual stipend of \$66,800. Health insurance and travel allowance will be provided.**

**Citizenship Requirements:** This opportunity is available to U.S. citizens and Lawful Permanent Residents (LPR) 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

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(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@ora.ou.edu](mailto:USDA-ARS@ora.ou.edu) and include the reference code for this opportunity.

**Qualifications** The qualified candidate should have received a doctoral degree in one of the relevant fields.

- Eligibility Requirements**

- **Citizenship:** LPR or U.S. Citizen
  - **Degree:** Doctoral Degree.
  - **Discipline(s):**
    - **Computer, Information, and Data Sciences** ([3](#) )
    - **Life Health and Medical Sciences** ([9](#) )