

**Opportunity Title:** USDA-ARS Internship in Phytochemical Analysis

**Opportunity Reference Code:** USDA-ARS-2021-0212

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

**Reference Code** USDA-ARS-2021-0212

**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
- Transcripts – [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** 11/5/2021 3:00:00 PM Eastern Time Zone

**Description** **\*Applications are reviewed on a rolling-basis and this posting could close before the deadline.**

**ARS Office/Lab and Location:** Two research opportunities are available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) located in Peoria, Illinois.

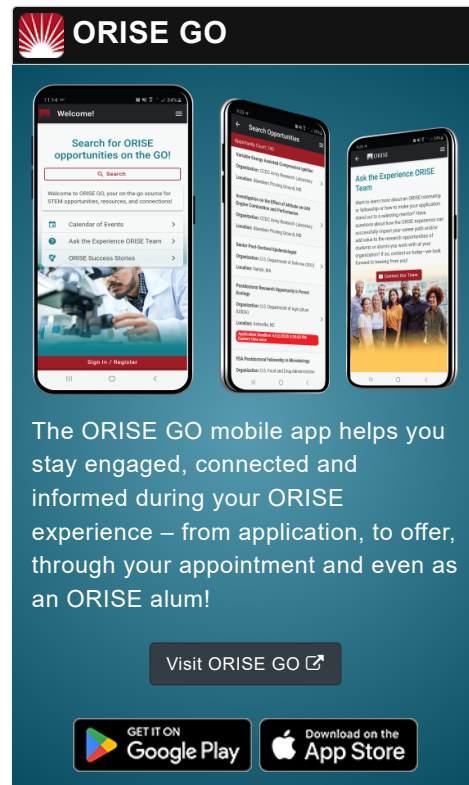
The National Center for Agricultural Utilization Research (NCAUR) is among the largest agricultural research centers in the United States. NCAUR employs nearly 250 scientists and support staff in research to improve agricultural production, food safety and public health, economic development, and environmental quality. NCAUR is committed to promoting interest in STEM in Central Illinois and beyond.

<https://www.ars.usda.gov/midwest-area/peoria-il/national-center-for-agricultural-utilization-research/>

The **Mission** of the Functional Food Research (FFR) Unit is to develop bioactive food ingredients that provide health benefits beyond basic nutrition and to create value-added food and nonfood products from low value agricultural resources. Scientists in the Functional Foods Research Unit (FFR) develop new processing, chemical, physical, and enzymatic technologies to modify food plants and enhance the use and performance of agricultural materials.

**Research Project:** This internship opportunity is under the **National Program 306:** developing knowledge and enabling commercially viable technologies to measure and maintain/enhance post-harvest product quality and create new value-added products in food, non-food and biorefining products.

The objective of this project is to evaluate new analytical

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methods to rapidly and accurately assess the phytochemical composition of hemp and other plant materials to create new biorefined foods and non-food products. As part of this project we need to enhance rapid and accurate methods for phytochemical discovery and high-throughput methods for measuring amounts of known chemicals present in plant tissues.

Under the USDA Industrial Hemp Initiative, NCAUR scientists are developing analytical methods to facilitate efficient utilization of oil, protein, and fiber from industrial hemp. New technologies that enable the commercial manufacture of co-products (both food and industrial) will be developed to support industrial hemp farming and biobased manufacturing in the U.S.

As an intern, you will learn about the analysis and characterization of the phytochemical composition of plant materials by the use of modern extraction methods, liquid and gas chromatography methodology and sample evaluation, modern mass spectrometry evaluation, and the processing of results for publication.

Lab activities will include proper documentation of sample identification and records, drying and grinding of samples, weighing and extraction of samples, preparation of samples for chromatographic analysis, chromatographic equipment checks, setting up chromatographic runs, collecting and processing data using spreadsheets, and formatting final results. This research will involve evaluating hemp and other plant materials including seeds, leaves, roots, flowers and stems. For more information on the current research project see:

<https://www.ars.usda.gov/research/project/?accnNo=438211>

**Learning Objectives:** Interns will learn about standardized methodologies for the rapid assessment of phytochemical composition in hemp and other plant species using modern chromatographic and spectrophotometric techniques. They will also learn about the good laboratory practices, good data record keeping and data collection, the general care and maintenance of modern lab analytical equipment such as high performance liquid chromatography (HPLC) systems and software.

This appointment will also instruct the intern on liquid chromatography-high resolution mass spectrometry as applied to the identification and quantification of phytochemicals /natural products from plants. We have the potential to learn about the purification of plant natural products from crude mixtures and the use of nuclear magnetic spectroscopy (NMR) to determine the chemical structure of plant natural products.

This appointment will build an efficient experience in modern plant analytical chemistry. These techniques are fundamental in working in modern plant research in both industry and academics. Analysis of hemp composition is a growing field in

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both academic research and private industry. Basic knowledge of chromatographic equipment maintenance and use will be an asset for applying for positions in graduate research programs and for private sector jobs at analytical firms and analytical instrument companies.

**Mentor(s):** The mentor for this opportunity is Mark Berhow ([mark.berhow@usda.gov](mailto:mark.berhow@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 upon recommendation of ARS and is contingent on the availability of funds.

**Level of Participation:** The appointment is part-time (20 hours per week). Students will participate on a flexible daily/weekly part time schedule (Monday through Friday) that can be adjusted to their schedule.

**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 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 [USDA-ARS@ornl.gov](mailto:USDA-ARS@ornl.gov) and include the reference code for this opportunity.

**Qualifications** The qualified candidate should be currently pursuing or have received a bachelor's degree in one of the relevant fields.

Laboratory experience would be an asset.





**Eligibility Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Bachelor's Degree.
- **Discipline(s):**

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- **Chemistry and Materials Sciences** (2 )
- **Computer, Information, and Data Sciences** (17 )
- **Life Health and Medical Sciences** (46 )
- **Mathematics and Statistics** (1 )