

2023 Summer Internships for Undergraduates

About the Water and Life Interface Institution (WALII, pronounced “Wally”): [WALII](#) studies how life interacts with water, from the molecular to the organismal level, across plants, fungi, and animals. [WALII is a virtual institute, with scientists located at nine research facilities across the United States.](#) Working together, WALII team members aim to uncover the rules by which organisms interact with water, exploring four integrated themes: 1) the physical and molecular determinants that allow organisms to survive in the solid state; 2) rehydration responses in desiccation-tolerant and -sensitive systems; 3) the molecular grammar of desiccation tolerance conferred by intrinsically disordered proteins; and 4) the short- and long-term evolutionary history of desiccation tolerance. WALII team members have diverse expertise, ranging from biophysics to plant biology, and experience with several desiccation-tolerant and -sensitive systems.

About WALII 2023 Summer Internships: Summer internships for undergraduate students are available at eight of the Water and Life Interface Institution campuses. [Each location has a separate application process and offers different experiences.](#) Students interested in WALII projects are encouraged to [apply to multiple campuses.](#) No previous research experience is required.

Interns working on WALII projects will form a virtual cohort*. Interns will participate in a mentorship program, online career development activities (such as a Q&A career panel and a graduate school preparation workshop), and will present at the annual WALII Virtual Symposium. All internships are paid opportunities, but the stipend amounts and program benefits may vary by geographic region.

Interns hosted by labs at Baylor College of Medicine, Carnegie Institution for Science, University of California (Merced), Michigan State University, and University of Wisconsin-Madison will also be part of an **on-campus cohort of interns unaffiliated with WALII and will have additional opportunities for in-person social activities.*

DEI Statements: *WALII is deeply committed to scientific excellence and diversity. We strongly encourage applications from candidates who will enrich and foster a diverse and inclusive environment. All WALII member institutions are equal opportunity employers. All applicants will receive consideration for employment without regard to race, color, religion, gender, sexual orientation, gender identity or expression, national origin, age, genetic information, disability, veteran status, or any other characteristics protected by law.*

Internship at WALII Campus: Baylor College of Medicine (Boeynaems Lab)

WALII Project: Molecular rules of membraneless organelle water responsiveness

About the Boeynaems Lab: Every cell needs to correctly fold, localize and regulate thousands of proteins at once in the crowded cellular environment. How cells pull this off remains, to this day, incompletely understood. Researchers in the Boeynaems Lab are investigating how life has evolved mechanisms that preserve proteostasis under stress conditions, and how these processes are perturbed in human disease. Learn more at: <https://www.boeynaemslab.org/about>

How to apply: Please apply through the [Summer Undergraduate Research Training Program \(SMART\)](#) application portal. In your application materials, specify that you are interested in working on the Water and Life Interface Institute project in the Boeynaems Lab. In your cover letter, describe why you are interested in the lab, the questions that you want to pursue, and your goals. ****NOTE:** Interns in this lab will be participating in the Summer Undergraduate Research Training Program, in addition to the WALII Internship Program

Application due date: January 13, 2023

Questions? Contact Steven Boeynaems at steven.boeynaems@bcm.edu

Internship at WALII Campus: California State University Channel Islands (Tapia Lab)

WALII Project: How does partial re-hydration affect desiccation tolerance?

About the Tapia Lab: Researchers in the Tapia Lab use baker's yeast as a model organism to study desiccation tolerance and the molecular mechanisms behind this trait. Undergraduate interns in the Tapia Lab will be directly involved in research aimed at understanding desiccation tolerance by performing a large array of genetic and biochemical experiments.

Nestled against the Santa Monica Mountains, CSUCI is located north of Los Angeles, south of Santa Barbara, and minutes from the ocean. (<https://www.csuci.edu/>).

How to apply: Send an email to Hugo Tapia (hugo.tapia@csuci.edu) with the following documents:

- CV detailing past academic, professional and research experience
- Cover letter describing why you are interested in our lab, the questions that you want to pursue, and your goals.

Application due date: March 31, 2023

Questions? Contact Hugo Tapia at hugo.tapia@csuci.edu

Internship at WALII Campus: Carnegie Institution for Science (Exposito-Alonso Lab)

WALII Project: Identify genetic determinants underlying desiccation tolerance by mining natural variation in seed germination across *A. thaliana* populations

About the Exposito-Alonso (Moi) Lab: The Moi Lab has experience in plant experimental ecology, evolutionary molecular genetics, and computer science. The lab asks questions such as “Can we predict complex ecological traits such as survivorship, fitness, and disease from an organism’s genome and environment? And, can we use novel molecular biology technology to understand the mechanisms of climate adaptation?” Learn more at: <https://www.moisesexpositoalonso.org/home>

How to apply: Please apply through the [Carnegie Summer Internship Program application portal](#). In your application materials, specify that you are interested in working on the Water and Life Interface Institute project in the Moi Lab. In your cover letter, describe why you are interested in the lab, the questions that you want to pursue, and your goals. ****NOTE:** Interns in this lab will be participating in the Carnegie Science Internship Program, in addition to the WALII Internship Program.

Application due date: March 15, 2023

Questions? Contact Clare Tuma at ctuma@carnegiescience.edu

Internship at WALII Campus: Michigan State University (Fleming Lab and VanBuren Lab)

WALII Project (Fleming Lab): What are the genetic and metabolic milestones of recovery from desiccation?

About the Fleming Lab: The overarching interest of the Fleming Lab is in uncovering the modes and consequences of cryptobiotic changes occurring in seeds, outside the context of germination. Researchers in the Fleming Lab look at transcriptomic and other responses to both controlled and naturally varying environmental conditions, with a high priority placed on identifying and validating genetic and physiological factors contributing to seed longevity in the soil seed bank. Learn more at: <https://www.canr.msu.edu/people/margaret-fleming>

WALII Project (VanBuren Lab): Identify conserved and lineage-specific molecular responses to anhydrobiosis

About the VanBuren Lab: The VanBuren Lab applies an integrative genomic, quantitative genetics, and evolutionary approach to understand the genetic basis of natural adaptations in plants for targeted crop improvement. Researchers in the VanBuren Lab use more conventional breeding approaches coupled with a systems biology approach to improve drought tolerance of underutilized crop species. Learn more at: <https://www.vanburenlab.org/research.html>

How to apply: Please apply through the [Plant Genomics REU Program](#) application portal. In your application materials, specify that you are interested in working on the Water and Life Interface Institute project in the Fleming Lab and/or the VanBuren Lab. In your cover letter, describe why you are interested in the lab, the questions that you want to pursue, and your goals. ****NOTE:** Interns in the Fleming Lab and/or the VanBuren Lab will be participating in the Plant Genomics REU Program, in addition to the WALII Internship Program.

Application due date: February 10, 2023

Questions? Contact plantgen@msu.edu

Internship at WALII Campus: University of California, Merced (Sukenik Lab)

WALII Project: How do proteins help protect cells from desiccation? (WALII Theme 1.1)

About the Sukenik Lab: The Sukenik Lab studies the interaction between proteins and their surrounding environment in the test tube and in cells, using a combination of live-cell imaging, spectroscopy, and computational modeling. Undergraduates working in the lab will work in a collaborative environment on projects involving computation and experiments. Learn more at: <https://www.sukeniklab.com/>

How to apply: Please apply through the [Center for Cellular and Biomolecular Machines \(CCBM\)](#) application portal. In your application materials, specify that you are interested in working on the Water and Life Interface Institute project in the Sukenik Lab. In your cover letter, describe why you are interested in the lab, the questions that you want to pursue, and your goals. ****NOTE:** Interns in this lab will be participating in the Center for Cellular and Biomolecular Machines Internship Program, in addition to the WALII Internship Program.

Application OPEN in January 2023: Please check the [CCBM Summer Internship Program \(C-SIP\)](#) Application Portal for updates and to submit applications.

Questions? Contact CCBM Executive Director Carrie Kouadio at ckouadio@ucmerced.edu

Internship at WALII Campus: University of Wyoming (Boothby Lab)

WALII Project: Surviving The Solid State (Theme 1)

About the Boothby Lab: The Boothby Lab uses tardigrades as a model for answering the questions: “How do organisms survive in extreme environments? And, What are the abiotic limits of life?” Answering these questions for organisms found on Earth will help to guide our search for life, both here on Earth and elsewhere. The Boothby Lab is addressing these questions by searching for organisms inhabiting environments that push the boundaries of what we consider possible conditions that can sustain life, and by employing synthetic biology to see how far we can push those boundaries. Learn more at: <https://www.boothbylab.org/>

How to apply: Send an email to Thomas Boothby (tboothby@uwyo.edu) with the following documents:

- CV detailing past academic, professional and research experience
- Cover letter describing why you are interested in our lab, the questions that you want to pursue, and your goals.

Application due date: March 31, 2023

Questions? Contact Thomas Boothby at tboothby@uwyo.edu

Internship at WALII Campus: University of Wisconsin-Madison (Otegui Lab)

WALII Project: How do cellular structures change during dehydration to solid-state?

About the Otegui Lab: Research in the Otegui Lab focuses on the regulation of vesicle trafficking mechanisms in plant cells. The lab's goal is to understand how cells control the flow of proteins and specialized metabolites between different cellular compartments. Learn more at:

<https://otegui.cellimaging.wisc.edu/>

How to apply: Please apply through the [Biological Interactions Summer Research Program](#) application portal. In your application materials, specify that you are interested in working on the Water and Life Interface Institute project in the Otegui Lab. In your cover letter, describe why you are interested in the lab, the questions that you want to pursue, and your goals. ****NOTE:** Interns in this lab will be participating in the Biological Interactions Summer Research Internship Program, in addition to the WALII Internship Program.

Application due date: February 15, 2023

Questions? Contact Marisa Otegui at otegui@wisc.edu

Internship at WALII Campus: USDA-ARS National Lab for Genetic Resource Preservation (Walters Lab)

WALII Project: Rehydration And Recovery (Theme 2)

About the Walters Lab: Research in the Walters Lab focuses on how to keep germplasm within the National Lab for Genetic Resource Preservation collections alive and healthy. Research focuses on seeds and pollen, because they naturally develop tolerance to the extreme dry and cold that we use in the genebank. Seeds from some of our favorite trees (e.g. oaks) and fruits (e.g. citrus) don't survive well under genebanking conditions, and the Walters Lab is responsible for investigating how we can treat these 'special cases' to ensure that we have the genetic resources needed for the future.

How to apply: Send an email to Christina Walters (christina.walters@usda.gov) with the following documents:

- CV detailing past academic, professional and research experience
- Cover letter describing why you are interested in our lab, the questions that you want to pursue, and your goals.

Application due date: March 31, 2023

Questions? Contact Christina Walters at christina.walters@usda.gov