Biology Research Opportunities at UWSP

Detection of Cannabis pathogens

Dr. Ann Impullitti
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Description: Cannabis is an emerging economic plant in Wisconsin. As acreage of Cannabis increases, it is likely that infection of plant tissues by plant pathogens will also increase. The primary objective of this project is to identify Cannabis pathogens in field-grown plants.

Techniques: : DNA extractions, PCR, sterile technique, culturing fungi and oomycetes
General Requirements for Students: Introductory Biology
Number of new students: 2
Project Timeline: Fall and spring

The Ecology and Evolution of *Clarkia* spp. in California

Dr. Brian Barringer
Professor of Biology
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Description: I have a number of ongoing projects focused on a few different species in the genus Clarkia (a group of annual plants native to the western US). Most of my work in this study system focuses in one way or another on understanding the ecology and evolutionary biology of plant mating systems. The work includes both greenhouse and lab work at UWSP and field work in CA.

Techniques: I involve students in all aspects of my research, including experimental design and execution, data analysis and interpretation, and sharing results via scientific conferences and publications
General Requirements for Students: Students must be intellectually curious, responsible, and must work well with others
Number of new students: Not actively recruiting but always interested in working with motivated students
Project Timeline: Fall and spring

The Ecology and Evolutionary Biology of *Cannabis* Sativa

Dr. Brian Barringer
Professor of Biology
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Description: I have a variety of projects focused on the ecology and evolutionary biology of Cannabis sativa. Some of my work focuses on understanding the ecology of feral populations and whether and to what extent feral lineages can be used to improve modern-day varieties. Other projects focus on the ability of this species to act as a phytoremediator (removing toxins from the soil and sequestering them in plant tissues). I'm also quite interested in the interactions this species has with other organisms (soil biota, insects, etc.).

Techniques: Experimental design, growing and caring for plants in the greenhouse and field, gathering, analyzing, and interpreting data, sharing results with others in written and oral presentations
General Requirements for Students: : Intellectual curiosity, responsible, motivated and takes initiative, positive disposition and works well on own and as part of a team
Number of new students: Not actively recruiting but always interested in working with motivated students
Project Timeline: Fall and spring

Department of Biology
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University of Wisconsin - Stevens Point

Heightened Awareness: How Social and Emotional Learning Pedagogy Aids STEM Teacher Preparation

Dr. Krista Slemmons, Associate Professor of Biology, Jesse Mossholder, Associate Lecturer of Education, and Dr. Laura Lee, Associate Professor of Biology
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Description: This project involves working on developing curriculum to be implemented during a summer week long workshop for 7th grade girls in STEM. The student will help with design and implementation as well as post workshop data analysis.

Techniques: Basic experimental design, writing and implementing science curriculum, data analysis, mentoring strategies.
General Requirements for Students: Willing to work on a team, interest in science education and promoting underrepresented groups in science.
Number of new students: 2
Project Timeline: Fall and spring

Identifying aquatic community resiliency following anthropogenic acidification and landscape alterations of Little Rock Lake, in the National Ecological Observatory Network (NEON), Wisconsin, USA

Dr. Krista Slemmons
Associate Professor of Biology
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Description: Lake sediment samples are collected from lake bottoms and analyzed for a variety of parameters including lake chemistry and aquatic organisms. The project analyzes a lake that was acidified over 40 years ago to determine the influence that event had on the aquatic community as well as the resiliency of the system.

Techniques: Microscopy, lake ecology sampling techniques, diatom identification, gathering and interpreting data.
General Requirements for Students: General interest in lake ecology, environmental issues and climate change. Ability to work with others and independently.
Number of new students: 2
Project Timeline: Fall and spring

Neural Responses of Zebra Finches Exposed to Vocalizations of A Current Partner, Ex-Partner or Stranger

Dr. Sarah Jane Alger
Associate Professor of Biology
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Description: Zebra finches were exposed to vocalizations of a current partner, ex-partner or stranger. Brains were fixed and stained for proteins indicating neuronal activity. We will be counting active cells under the microscope for multiple brain regions of interest to see how brain activity compared in these three conditions.

Techniques: Microscopy and data analysis
General Requirements for Students: Must commit to the project for at least 2 semesters.
Number of new students: 1-4
Project Timeline: Fall and spring

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Parasitology Museum Curation and Digitization Projects

Dr. Sarah Orlofske
Associate Professor of Biology
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Description: The UWSP Stephen J. Taft Animal Parasitology Collection contains over 22,000 specimens and represents one of the largest parasite- focused collections in the Midwest. Active curation of physical slide and vial specimens is needed to secure the collection for research and teaching purposes. Active digitization efforts make our specimens available to the public, researchers and students world wide. Current emphasis is on Arthropod parasites, but significant work is needed on Helminths and Protozoa.

Techniques: Museum preservation methods, microscopy (including digital photo microscopy), molecular methods for species identification, literature reviews and exhibit development and outreach.
General Requirements for Students: General interest in Museum Collections, Natural History, Parasitology, Taxonomy, Evolution or Systematics. Ability to work as a team and follow detailed protocols for handling specimens, working with microscopes, and computer programs. General computer skills including Microsoft Excel and Adobe Creative Suite.
Number of new students: 1-3
Project Timeline: Fall and spring

PFAS phytoremediation and soil microbiology

Dr. Ann Impullitti
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Description: Per- and polyfluoroalkyl substances (PFAS) are a class of man-made chemicals with widespread use in industrial applications. Because of their exceptional stability and high-water solubility, PFAS are persistent in the environment. We are currently investigating the ability of hemp (Cannabis sativa) and alfalfa (Medicago sativa) to remove PFAS from soil through a process termed phytoremediation (i.e., the uptake of contaminants using plants). We are also interested in understanding how soil quality and the soil microbial community influence PFAS remediation.
Techniques: DNA extractions, PCR, aseptic technique, culturing bacteria
General Requirements for Students: Introductory Biology
Number of new students: 2
Project Timeline: Fall and spring

Primate Stress Behavior and Fecal Cortisol Analysis

Dr. Sarah Jane Alger
Associate Professor of Biology
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Description: Primates Incorporated is a primate sanctuary about one hour south of campus. They collect behavioral data and fecal samples from their residents and send them to us for analysis. This project is to statistically explore the available data and write a grant to process the fecal samples.

Techniques: Grant writing and statistical design and analysis
General Requirements for Students: The completion of biology and statistics courses is preferred, but not required.
Number of new students: 1-2
Project Timeline: Fall and spring

Waterfowl Parasitology: Ecosystem and Community Ecology

Dr. Sarah Orlofske
Associate Professor of Biology
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Description: Waterfowl are obtained from hunters and then dissections are performed by standardized protocols to obtain accurate species identifications and quantitative data on infection prevalence and intensity. We address a variety of research questions including detecting the presence of pathogenic species or discovery of new species. Overall the ecological and evolutionary significance stems from understanding how the environment or host characteristics influence parasite infection and the potential impact parasites have on hosts. There are also numerous opportunities for public engagement and outreach through existing collaborations with Wisconsin Waterfowl Association, USGS, WDNR, and individual hunters.

Techniques: Microscopy, dissection protocols, museum methods, molecular techniques
General Requirements for Students: Interest in parasitology, ecology, evolution or wildlife disease. Ability to work as a team and follow detailed safety protocols. Attention to detail and interest in statistics and data analysis.
Number of new students: 2-4
Project Timeline: Fall and spring

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