Wyoming INBRE

IDeA Networks for Biomedical Research Excellence

# Wyoming INBRE Research Network Retreat

## September 10-12, 2026

University of Wyoming at Casper

Casper College

Casper, WY

*Wyoming INBRE is supported by a grant from the National Institute of General Medical Sciences (#2P20GM103432) from the National Institutes of Health. Any opinions expressed or results presented are solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.*

## Thursday September 10, 2026

**6:00-7:30PM** -**Welcome reception** (light snacks and cash bar)
Location: Hilton Garden Inn (Ballroom), 1150 North Poplar Street, Casper, WY 82601.

## Friday September 11, 2026

UW-Casper and Casper College, University Union building (UU), Classroom 322

**8:30**-9:30AM: Light continental breakfast.

**9:30-10:00AM**: **Welcome & Introductions** (Wyoming INBRE Director/Principal Investigator: Dr. David Fay).

**10:00-11:50AM:** "**Academic & Career Paths of Community College Faculty"**
Five-minute faculty flash talks using one PPT slide; 2 presenters per college.
Moderator: **Sean Harrington**

1. **Luis Alza**, PhD (Department of Biology, Casper College)
2. **Charlotte Snoberger**, MS (Department of Biology, Casper College)
3. **Christopher Wenzel**, MS (Department of Science and Mathematics, Eastern Wyoming College)
4. **Steve Howard**, PhD (Department of Social and Behavioral Sciences, Eastern Wyoming College)
5. **Eva Harlan**, PhD, MSE (Department of Life Science, Sheridan College)
6. Ami Erickson, PhD (Department of Life Science & Department of Agriculture, Sheridan College)
7. **Allan Childs**, MS, PhD (Emeritus, Department of Chemistry, Northwest College)
8. **Austin Conklin**, PhD (Department of Biology, Northwest College)
9. **Joshua Holmes**, PhD (Department of Science and Outdoor Recreation, Western Wyoming Community College)
10. **Riley Smith,** PhD (Department of Science and Outdoor Recreation, Western Wyoming Community College)
11. **Claudia Troxel,** PhD (Department if Science, Central Wyoming College)
12. **William Finney**, PhD (Department of Science, Central Wyoming College)
13. **Miranda Theriot**, PhD (Department of Biology, Laramie County Community College)
14. **Gavin Martin**, PhD (Department of Biology, Laramie County Community College)

11:50AM-12:00PM: Break

**12:00-1:30PM: Lunch Buffet with keynote presentation**:

## Thailand's Migrating Giant Honey Bees: From Discoveries to Protection.

**Will Robinson**, **PhD**
Emeritus Professor, Department of Biology, Casper College

**ABSTRACT**

On sabbatical in 2009 in northwestern Thailand, Will Robinson witnessed a remarkable phenomenon that scientists had never seen: a place where numerous groups ("bivouacs") of giant honey bees, Apis dorsata, gather simultaneously during their long migrations. The site is a mango orchard and its immediate surroundings at an agricultural research station on the Pai River. Dozens of colonies use the stopover site every fall. Will and his wife, Maria Katherman, returned three more autumns to study the bees, observing numerous fascinating, sometimes spectacular behaviors. Maria also taught language courses at the local college.

In addition to giant honeybees, three other honey bee species (genus Apis) native to Thailand utilize the same location for nesting, feeding and an array of defenses against predators.

This unique stopover site is clearly worthy of recognition and protection well into the future. Consulting with Worldwide Fund for Nature International (WWF) officials in the U.S. and Thailand, Will and Maria agreed that a sensible beginning point was to erect sturdy interpretive nature signs at the site. In 2023, with financial aid from WWF and much local assistance, the couple managed the construction and placement of signs along a road by the orchard.

The signs highlight the importance of the site for all four Apis species. They describe the value of bees as pollinators. They emphasize the conservation of giant honey bees, interesting behaviors of both the giant bees and other honey bees, and the need for protection of honey bees and other pollinators.

1:30-1:45PM: Break. (Undergraduate students upload their PPT presentations on the classroom computer).

**1:45-3:45PM: Undergraduate Presentations.**
Moderator: **Annie Bergman**.

1:45-2:00PM: **Defining PopZ Interaction Specificity: Identifying Amino Acids Required for Specific Partner Binding.** Jamie Harris, Alexis Sagely and Josh Holmes. Department of Science and Outdoor Recreation, Western Wyoming Community College.

2:00-2:15PM: **Undergraduate Environmental Health Research: Three Pilot Studies Connecting Ecology, Technology, and Public Outreach**. Joseph Tyson, Erin Asper, Dylan Hicks, Caleb Troutman, and Luis Alza. Department of Biology, Casper College.

2:15-2:30PM: **From the sagebrush plains to discarded tires behind the barn, INBRE investigations in biomedical research at Northwest College.** Tamara Rozmetova, Paul Curry, Roger DesRosier, Eric C. Atkinson, Allan Childs, Austin Conklin. Department of Biology, Northwest College.

*2:30-2:45PM: Break*

2:45:3:00PM: **Denitrifying Microbes Play a Key Role in Nitrogen Cycling in Drylands.** Cecilia Halvorson, TeAnna Jolovich, and Christopher Wenzel. Department of Science and Mathematics, Eastern Wyoming College.

3:00-3:15PM: **Potential Effects of Wildfire and *Artemisia tridentata* Smoke on Human Bronchial Epithelial Cells and *Drosophila melanogaster*.** Mackenzie Nez, Lucy Graham, and Claudia Troxel. Department of Science, Central Wyoming College.

**3:15-5:45PM:** (Students) **Explore Casper and area** (on your own).

**3:15- ~4:00PM: Wyoming INBRE meeting** (Community Colleges and UW-Casper faculty with Wyoming INBRE administrative team).

**6:00-8:30PM: Networking Dinner at "The Refinery"** (Buffet with cash bar)
1601 King's Boulevard, Casper, WY 82604.
Outdoor venue (Tent on Three Crown Golf Course driving range)

Saturday September 12, 2026

UW-Casper and Casper College, University Union building, UU 322 & UU 315

**8:45-11:00AM: Brunch** (UU 322).

Concurrent sessions for faculty vs. students (UU 322 & 315):

**9:30-11:00AM:** Community College faculty discussions with the Wyoming INBRE administrative team.

**9:30-11:00AM:** (**Student activity**) "**STEM Degrees & Career Paths" Panel Discussion** led by Casper professionals (medical field & allied health, and energy industry). Moderator: **Florence Teulé-Finley**, PhD (UW-Casper).

**Shawn Ficken**, PA-C, RT(R), CT, IR
Casper Medical Imaging & Outpatient Radiology
(Physician Assistant-Certified, Registered Technologist (Radiography)
Computed Tomography, Interventional Radiology)

**Morgan Johnson**, MD
Emergency Medical Physician, Banner Wyoming Medical Center

**Jed Doxtater**, MS, Associate Professor
UW-Casper Medical Laboratory Sciences (MLS) Program Director

**Katrina Hergenreter**, PE (Petroleum Engineer) Consultant
Badger Consulting Services (Oil & Gas)

**11:00AM:** The event adjourns.

## UNDERGRADUATE PRESENTATION ABSTRACTS

1:45-2:00PM**: Defining PopZ Interaction Specificity: Identifying Amino Acids Required for Specific Partner Binding.** Jamie Harris, Alexis Sagely and Joshua Holmes. Department of Science and Outdoor Recreation, Western Wyoming Community College

### ABSTRACT

Cellular organization is essential for bacterial growth, division, and adaptation. In the bacterium *Caulobacter crescentus*, the polar organizing protein PopZ forms a scaffold at the cell poles and recruits multiple proteins involved in chromosome segregation and cell-cycle regulation. Although many proteins interact with PopZ, it remains unclear how a relatively short region of PopZ distinguishes among different binding partners. Our research aims to identify the amino acids that determine the specificity of these protein–protein interactions.

Previous screens of a PopZ mutant library identified substitutions within the first 26 amino acids that altered interaction with the binding partners ChpT or RcdA. The library was designed to replace each amino acid in this region with every other possible amino acid, allowing the effects of individual substitutions to be examined. In the current study, we are cross-screening selected PopZ mutations identified in the ChpT and RcdA screens against additional PopZ binding partners. This approach allows us to determine whether a mutation broadly disrupts PopZ function or selectively affects interaction with a particular partner.

Protein interactions are evaluated using a heterologous *Escherichia coli* colocalization assay. Fluorescently tagged PopZ and partner proteins are coexpressed and imaged by fluorescence microscopy. Their localization patterns are then quantified to distinguish full, partial, and lost interactions. Our results indicate that mutations within the PopZ N-terminal region can produce different interaction outcomes depending on the binding partner tested, supporting the idea that specific amino acids contribute to partner recognition rather than serving only as a general binding surface. Continued cross-screening with additional partners will help define shared and partner-specific interaction determinants. Together, this work provides insight into how PopZ organizes multiple proteins at the bacterial cell pole and advances our broader understanding of specificity within protein–protein interaction networks.

2:00-2:15PM: **Undergraduate Environmental Health Research: Three Pilot Studies Connecting Ecology, Technology, and Public Outreach.** Joseph Tyson, Erin Asper, Dylan Hicks, Caleb Troutman, and Luis Alza Leon**.** Department of Biology, Casper College.

### ABSTRACT

During summer 2026, five Casper College undergraduates conducted three pilot studies addressing environmental health challenges in Casper, Wyoming: terrestrial plastic pollution across different habitats, amphibian monitoring using environmental DNA (eDNA) in ephemeral aquatic habitats, and wildlife behavior related to Chronic Wasting Disease (CWD) transmission using camera traps.

Supported by a Wyoming INBRE grant and funds from the Biology Department at Casper College, these projects give students hands-on experience with the complete scientific process, from observing, reading, contacting experts in each field, summarizing information, and developing research questions, to collecting and expanding preliminary field data, conducting laboratory analyses (microscope observations, DNA collection, camera-trap image screening), using descriptive statistics, and communicating scientific findings.

The pilot studies also establish protocols and baseline information for long-term environmental monitoring and future undergraduate research. Beyond research, the projects are designed to engage other students and the general public through outreach and communication activities. Together, they integrate undergraduate research, environmental health, and science education while preparing students to pursue careers and advanced training in ecology, wildlife biology, and environmental health.

2:15-2:30PM: **From the sagebrush plains to discarded tires behind the barn, INBRE investigations in biomedical research at Northwest College.** Tamara Rozmetova, Paul Curry, Roger DesRosier, Eric C. Atkinson, Allan Childs, Austin Conklin. Department of Biology, Northwest College.

**ABSTRACT.**

NWC INBRE provides a great learning opportunity for undergraduate students. Participants engage in hands-on biomedical research alongside faculty members and fellow students. INBRE allows students to conduct research outside of the classroom and learn more about scientific procedures. We gain experience with laboratory techniques, data collection and analysis, scientific communication, writing, and teamwork from the laboratory to the field. Through our involvement in the program, we can apply what we learned to real-world research and build skills benefiting us in our future professions. Taking part in being an overall positive benefit to INBRE itself has students in finding what we value in the world around us, including contributing to the growing of society itself. An important theme in our program is that we all listen to each other and can contribute. As part of this work, as an overall INBRE group employing Zone of Inhibition assessment, we investigated the efficacy of extracts from aromatic Wyoming plants against three bacteria with several plants (e.g., black sagebrush, rocky mountain juniper, and mountain big sagebrush) exhibiting strong effects. Interestingly, the three subspecies of big sagebrush each showed different effects, with mountain big sagebrush, not surprisingly, the strongest. On another project, we described the fungal diversity inhabiting plastic refuse, specifically agricultural tires and polytwine used to bale hay. With an eye toward finding fungi that degrade plastics potentially addressing this environmental pollution problem. This year, we will focus on both our ZOI project and fungal*plastic degradation project working through both with the accolades of the NSF Accelerating Research Translation Award last spring. Subgroups of our program will assist setting up a mammalian cell culture lab; extract, amplify, and sequence avian malaria lineages; screen avian blood slides for malaria; assess birds for WNV antibodies; and assess sagebrush extracts against bacteria causing pneumonia in bighorn sheep.

*2:30-2:45PM: Break*

2:45:3:00PM: **Denitrifying Microbes Play a Key Role in Nitrogen Cycling in Drylands.** Cecilia Halvorson, TeAnna Jolovich, and Christopher Wenzel. Department of Science and Mathematics, Eastern Wyoming College.

**ABSTRACT.**

Dryland communities include discrete patches of vegetation that provide habitat for microbes. Microbes are major drivers of nitrogen cycling processes such as denitrification, however, an understanding of their capacity is limited. Soil samples were exposed to various temperature, light, and moisture conditions and exhibited distinct variation in microbial gene frequencies dependent on treatment group. Microbial genes including fungi (ITS), Protists (18S), and bacteria (16S) in addition to denitrifying genes (nirS and nosZ) were examined to determine their relative frequency in our samples.

The goal of our study was to determine the effects of temperature, moisture, and light intensity on the frequency of soil microbes, and their nitrogen cycling capacity. Results indicate nosZ genes were more frequent then nirS genes across nearly all treatment groups indicating active bacterial denitrification. In addition, fungi (ITS) appear to be most tolerant to drying conditions as consistent numbers are evident in all treatment groups, while protists and bacteria (18S, 16S) had the most resilient response to all variables.

3:00-3:15PM: **Potential Effects of Wildfire and *Artemisia tridentata* Smoke on Human Bronchial Epithelial Cells and *Drosophila melanogaster*.** Mackenzie Nez, Lucy Graham, and Claudia Troxel. Department of Science, Central Wyoming College.

**ABSTRACT.**

Wildfire smoke is just what comes with the summers here in Wyoming, in fact many people associate the smell with the end of the summer and the welcome of the fall season. Many people spend their late summers here on vacation, or have remained here in Wyoming their whole lives, which leads to the question of whether or not the smoke affects residents more than we realize. Our INBRE members are interested in determining if there is a correlation between potential inflammatory and oncogenic lung effects over time, and if Native American medicinal plants can moderate those effects. Last year at Central Wyoming College, laboratory work focused on honing methods of exposure of both Human Bronchial Epithelial Cells in culture and *Drosophila melanogaster* to both smoke from *Abies lasiocarpa*, Alpine fir, and *Artemisia tridentata*, Big sage. Preliminary work on cell viability (cells) or mortality of flies suggested that smoke from Big sage was not protective, but rather is more toxic than woodfire smoke alone. This year's work will continue to focus on exploring the preliminary effects of oncogenic and inflammatory effects on the lungs, and then expand to explore the effects of other native plants in the area.

NOTES