August 2022 **Vol 2, Issue 1**

SI BRIDGES

NEWSLETTER

SI Bridges is an NIH-funded program that supports STEM students who transfer to SIUC from Community Colleges.

Over the past year, I have had the pleasure of serving as the John A. Logan College liaison for the SI Bridges program. My first experience with the program was attending the poster session last summer. I was impressed with the students' ability to communicate their research objectives and clearly explain their scientific methods. I was also amazed at the variety of the research projects. It has been exciting to work with the SI Bridges students at JALC and hear about their motivation to engage in scientific research. I have also enjoyed having the SI Bridges staff teach a series of labs for the introductory biology course at JALC during the fall and spring semesters. Students were introduced to the process of research, encouraged to ask unknown questions, and trained in research skills like DNA extraction, PCR, gel electrophoresis and bioinformatics. Not only was this experience beneficial in educating students about scientific techniques, but it also demonstrated how science has an impact on our everyday lives. I am excited to continue working with SI Bridges program and look forward to helping students succeed in this program.

Hannah Henson,
SI Bridges representative
John A Logan Community College

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MEET COHORT 7

This year we welcomed six new students from JALC and SCC.

Taryn Sauerbrunn

Taryn graduated from JALC in Spring of 2022 with an associate degree in science. She is attrending SIUC in Fall 2022 where she will study human nutrition and dietetic. In her free time, Taryn enjoys reading and writing.

Braeden Irby

Braeden is a freshman at JALC. He is planning to transfer to SIUC in Fall 2023 with a major in biology. His goal is to become a physician or surgeon specializing in orthopedics.

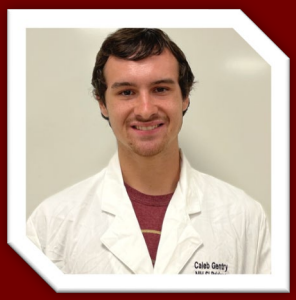
Alexis Pennington

Alexis is a freshman at JALC with plans to major in plant biology after transferring to SIUC. She enjoys learning about how to grow and nurture plants, which she sells at farmer's markets.

Hannah Phillips

Hannah is a freshman from JALC majoring in biological sciences. She made the President's List for Fall 2021. She will transfer to SIUC in Fall 2023 and major in microbiology. In her free time, Hannah is interested in art and leads craft groups.

Caleb Gentry



Caleb recently graduated from Shawnee CC and is attending SIUC in Fall 2022 where he is pursuing his passion for wildlife by majoring in Zoology. In his free time, Caleb enjoys acting and has participated in several local plays.

Rebekkah Schemonia

Rebekkah graduated from Shawnee CC and is attending SIUC in Fall 2022 where she is majoring in animal science with a minor in equine science. In her free time, Rebekkah enjoys gardening and taking care of farm animals.

Recognition of Excellence

We extend congratulations to our current and former scholars for the following prestigious awards and honors. We are very proud.

- **Caleb Gentry and Taryn Sauerbrunn were awarded the competitive Transfer Achievement Scholarship.**
- **Jewel Green and Rebekkah Schemonia received the Saluki Transfer Commitment Fellowship, 2022-2024.**
- **Cohort 6 scholar Tehya Payne received first place for outstanding undergraduate presentation at the SIU Research and Creative Activities Research Forum. She was also awarded the Robert C. Leadership award for outstanding record of citizenship and service.**
- **Emily Duran and Tamara Keene from cohort 6 at SIU made the Fall 2021 Dean's list for maintaining GPA of above 3.5**
- **Cohort 4 scholar Samuel Ramirez was awarded 2nd place in the Graduate Research Poster competition at the North Central Weed Science Society 76th Annual Meeting.**
- **Cohort 2 scholar Tasha Swenney graduated with a masters in biology and will be starting her PhD in biology at the University of Kentucky in Fall 2022 with full support from a graduate assistantship.**
- **Congratulations to Kailee Henderson, Emily Duran and Tehya Payne for graduating from SIU with a degree in radiological sciences, plant biology and psychology, respectively.**

SI BRIDGES SCHOLAR START RESEARCH TRAINING

Incoming scholars in cohort 7 began their training at SIUC through Connecting Life sessions for 3 hours each week of the Spring 2022 semester. The focus was understanding the process of science using *Tetrahymena*, a single-celled organism to study biological processes such as phagocytosis and to extrapolate these concepts to multicellular organisms, including humans. Each scholar was guided through inquiry-based investigations using a Lx300 trinocular LED microscope equipped with a 5MP Dino-lite Digital Camera and a Wi-Fi adapter that connected to the DELL laptop. This system allowed scholars to record images and videos of their microscope samples, and to collect and share their own data. Because COVID interfered with hands-on activities last year, cohort 6 scholars also participated in Connecting Life and all scholars worked together in developing questions, designing experiments, and conducting their own research using *Tetrahymena* as their model organism. Students proposed and investigated research topics that included the effects of environmental pollutants (herbicides, ethanol, and stimulant drugs like caffeine), and physical parameters (cold and heat) on the overall health and behavior of *Tetrahymena*.

At the end of the training, scholars presented their findings to their peers who evaluated their presentation and provided feedback for improvement. Most of the scholars noted that the presentations were well organized, detailed, and the use of figures and tables made the results easy to understand. Scholars applauded their peer's presentation style, tone, and the clarity of their talk. We witnessed complete transformations in confidence, knowledge, and engagement in all our scholars. They were motivated by curiosity, the excitement of discovery, and the drive of learning. This experience will prepare them for the upcoming SRI.

SI Bridges scholar Alexis Pennington reflected "The Connecting Life experience gave a sense of research conduct and equipped me with the ability to understand and perform original experimental design. I am honored to work closely with graduate students and research professionals to acquire an invaluable skillset that will accompany me through the rewarding path of my academic research career. Undergraduate research with SI Bridges is an indispensable asset to my future and career. I am developing knowledge and competency at an early point of my academic career that will accentuate my contributions to the discipline."

An element of Connecting Life was to introduce new scholars to research at SIU. During the sessions, PIs presented their research, and provided tours in their labs. They also talked about the importance of finding a mentor, the selection process and expectations of mentor and mentee. Incoming scholars then explored research interests of faculty in appropriate departments by research accomplishment and publications of potential mentors. Based on their selection they interviewed a faculty member and wrote a report. This analysis helped us determine if the scholar is a good match with the selected mentor.

"I am developing knowledge and competency at an early point of my academic career that will accentuate my contributions to the discipline"

- Alexis Pennington (Incoming SI Bridges scholar and JALC student)

SCHOLARS ENGAGE IN 2-WEEKS SUMMER RESEARCH EXPERIENCE

Incoming scholars participated in a two-week hands-on training session from May 23-June 3 focusing on molecular biology and protein biochemistry led by Dr. Laxmi Sagwan-Barkdoll. We also had two prospective SI Bridges students participate in the 2-week research experience.

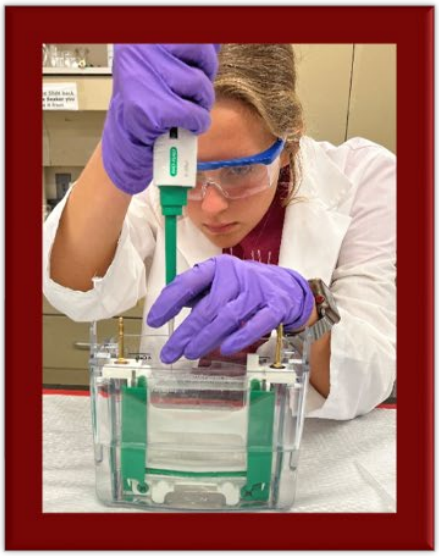
Initially students conducted variety of experiments to develop a solid foundation in research basics. These skills included properly pipetting solutions, keeping a lab notebook, running a PCR reaction, gel electrophoresis, and fingerprinting. Students began the week with an introduction to forensic science. Students learned the science behind forensics, how to fingerprint ourselves, others, identify and classify our fingerprints, and lift them off objects such as cans. Students then transitioned to genetics and used PCR to match different "suspect's" DNA to the culprit.

Students then focused on a mini-project exploring the structure and function of watermelon enzyme Malate Dehydrogenase. Basic and Specialized skills were acquired during this time including growing culture, protein expression, cell lysis, protein purification, and SDS Page. Students also engaged with professional research software like PyMOL. Students used PyMOL to model the 3D structure of Malate Dehydrogenase and mutations to key amino acids. At the end of the two-week research experience, students gave short group presentations on different sections of the research process for the protein biochemistry experiment.

SI Bridges scholar Taryn summarized her experience "The information taught during these 2 weeks were broken down into comprehensible pieces by splendid teachers, Laxmi Sagwan-Barkdoll and William Browning. They created a supportive learning environment, embraced any questions we had, and guided us through the experiments, making sure we understood each step of the way! What I learned fostered success in my current lab, giving me the skills; I needed to conduct my research, as well as confidence in processes that were previously unfamiliar. This experience is unlike any other, and the only requirement is unsatisfied curiosity."

Scholars also toured research facilities at SIU, explored career options and heard from former scholars about their research. Through this 2- week experience, students improved their science background, networked with professionals and integrated into SIU community, and developed transferrable research skills that they took to their research lab at SIU. After the 2 weeks experience, scholars from cohort 6 and 7 scholars engaged in mentored research in their respective labs.

SI Bridges scholars in action



SI Bridges in the community

COURSE BASED UNDERGRADUATE RESEARCH EXPERIENCES (CURES)

In collaboration with participating community college faculty, we implemented and assessed the following two inquiry-based, mini-research CUREs in Fall 2021.

CURE 1: "Assessing the antimicrobial efficacy of different commercial hand sanitizers" was implemented in Human Bio 115 at Shawnee Community College (SCC). Students assessed ingredients and investigated the effectiveness of hand sanitizers in inhibiting the growth of common microorganisms such as gram-positive and gram-negative bacteria, and fungi. They designed and conducted experiments to address a research question using the agar diffusion method. Students then measured the zone of inhibition and learned to statistically analyze their data and derive conclusions on the antimicrobial efficacy of commercial hand sanitizers.

Students from SCC engaged in a microbiological based CURE where they gained confidence in handling and plating bacterial cultures, measuring, recording data, plotting graphs and calculating p values and understanding their significance.

CURE 2: "What fish are you really eating" was implemented in Bio 101 at John A. Logan Community College (JALC). Students isolated DNA from various fish samples purchased locally, amplified mitochondrial gene COI (cytochrome c oxidase subunit 1) with PCR, and verified the DNA fragment through gel electrophoresis. On sequencing their DNA fragment, students were trained in bioinformatics and phylogenetic analyses to identify their fish species and determine the extent of mislabeling.

Students from JALC engaged in a molecular biology based CURE where they gained confidence in extracting DNA, setting up PCR, running gel electrophoresis and bioinformatics analysis.

SI BRIDGES

A Partnership

MEET THE TEAM

SIUC

Scott Hamilton-Brehm
Karen Renzaglia
Laxmi Sagwan-Barkdoll
William Browning

JALC

Stephanie Hartford
Hannah Henson
Jo Forer

SCC

Lori Armstrong

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