SI Bridges Newsletter

SI Bridges to Baccalaureate | 1/12/2018 | Volume 1, Issue 5

SI Bridges Mentored Research Experience

Cassandra Meadows

SIB scholar Cassandra Meadows, a recent biological science graduate from JALC, is working with mentor **Erin Perry**, Assistant Professor of Animal Science, Food and Nutrition at SIUC. They are working to investigate palatability in Equine Treats. The objective of her study was to observe the choices and reactions that horses have when given food flavored with different oils. Her role mostly included leading horses, moving feed, keeping track of her specific horses, recording data for each horse. She is monitoring eating behavior of horses (amount of chewing, choice of food, excessive saliva, head nodding, flehmen response). Her research is important as horses are prone to illness such as stomach ulcers and choke. An increase in saliva production is shown to help prevent and even heal the horses of these conditions. She plans to increase saliva production by enticing the horses with flavored foods containing herb-based oils.

SIB scholar Cassie is assisting the horse, Cheyenne into the stable to start her study.

Cassie and Jessie Francis (Ph.D. student) feeding the horse, Monet

Cassie has started her research with Dr. Perry in August 2017 and is thankful for the opportunity to participate in research at SIUC through the SI Bridges program. She hopes that this experience will help her achieve her goal of being a vet. She will also be transferring to SIUC in Fall 2018 and plans to continue her research with Dr. Perry.

Katrina Beaver

SIB scholar Katrina Beaver, a pre-physician assistant student from JALC, is currently working with mentor **Derek Fisher,** Assistant Professor of Microbiology at SIUC. They are working together in understanding the role of chlamydia partner switching mechanisms under different stress conditions. Her goal was to study transcript levels of various chlamydia genes euo, GroEL, GroEL2, GroEL3, RsbV1, RsbV2 and CTL0852 using quantitative PCR (qPCR). To achieve this, she started with PCR optimization and validation of qPCR primers. She then investigated the expression of these genes at different time intervals in the chlamydial growth stages post infection. The research began in August 2017, and although analysis is still ongoing, Katie has observed that these genes are expressed during the early or late stages of development. She is excited about continuing her research in spring 2018 and planning to graduate with her associates as well. She will then transfer to SIUC in Fall to pursue a Bachelors in Microbiology or Physiology before heading to P.A. school.

Garrett Murry

SIB scholar Garrett Murry, a biological science student from JALC, is currently working with mentor **Rod Weilbaecher**, Research Assistant Professor of Biochemistry and Molecular Biology. They are working toward investigating the function of Bre2 and Sdc1, two subunits within the Set1 complex and their effect on methylation of histone 3 lysine-4 (H3K4). His research is important because several studies have shown that mutations in the human Set1 complex result in dysregulation of H3K4 methylation which is associated with cancers, such as leukemia. He is currently in the process of cloning Bre2 and Sdc1 in epitope-tagged vectors and transforming them into *E. coli*. He will then perform antibody assays to test methylation functions of Bre2 and Sdc1 and their role in higher level di-and tri-methylation of H3K4. Garrett will continue his research with Dr. Weilbaecher in Spring 2018 and plans to transfer to SIUC in Fall 2018 towards a major in Biochemistry.

Samuel Ramirez

SIB scholar Samuel Ramirez, a student from JALC, is currently working with mentor **Karla Gage**, Assistant Professor of Plant Soil and Agricultural Systems and Plant Biology at SIUC. They are working toward artificial methods for breaking seed dormancy in Palmer amaranth. Palmer amaranth has been shown to significantly reduce crop yield, due to the presence of herbicide-resistance biotypes. Screening for herbicide resistance in whole-plant assays may be problematic for researchers due to seed dormancy. Hence, the goal of this study was to collect and clean plant seeds from Belleville (BRC) and Collinsville (COL) and treat the seeds with 10M sulfuric acid (H_2SO_4) at different time intervals and different concentration of potassium nitrate (KNO_3) for 10 minutes, respectively. He then monitored the progression of seed germination for 21 days and analyzed the data with statistical methods to demonstrate significance. His study showed that 2 minute H_2SO_4 treatment was effective in breaking seed dormancy in BRC population whereas nitric acid treatment showed greater success with COL population. This data demonstrates that different artificial methods should be implemented for breaking seed dormancy in different populations of Palmer amaranth when planning whole plant herbicide-resistance screening assays.

Samuel Ramirez is seen here, planting Palmer amaranth seeds on moistened filter paper in Petri plates.

Sam recently presented his research in North Central Weed Science Society (NCWSS) 2017 Annual Meeting. He plans to perform tetrazolium test for the viability of seeds and will be continuing his research with Dr. Gage in Spring. He will also be graduating with his associates from JALC and transferring to SIUC in Fall 2018 to pursue a degree either in Plant Biology or Agricultural Sciences.

Kayla Stuthers

SIB scholar Kayla Stuthers, a biological science student from JALC, is currently working with mentor **Bethany Rader,** Assistant Professor of Microbiology at SIUC. Together, they are analyzing the function of a Spo0M homology in a gram-negative bacterium, *Vibrio fischeri*. Her goals are to knock out the Spo0M gene in *V. fischeri* using latest molecular biology techniques and confirming the mutation via a biofilm assay. The mutant form of *V. fischeri* will be then introduced in a squid, a highly specific model system for *V. fischeri* and study host-microbe associated symbiotic benefits by obtaining their hemocytes. This research has implications in the field of innate immunology.

Kayla performing squid duties

She also enjoys taking care of squids or as she calls it 'squid duties' like feeding, checking clutches of eggs, maintaining water salinity, temperature. Kayla is thankful for the opportunity to participate in research at SIUC through the SI Bridges program. She will be transferring to SIU in Fall 2018 to pursue a major in molecular biology and a minor in physiology.

Aaron Brenningmeyer

SIB scholar Aaron Brenningmeyer, an undergraduate student in Nursing at SCC is working with mentor **Gregory Rose,** Professor of Anatomy at SIUC School of Medicine. Together, they are working towards anatomical differentiation of corpus callosum and hippocampus between typical adolescents and adolescents diagnosed with autism spectrum disorder. He used a Harvard program, Freesurfer to analyze MRI scans by calculating the sizes of specific brain regions using voxel volumes and later comparing these differences with control groups. His experimental group consists of students (15-17 yrs) at Brehm in Carbondale and

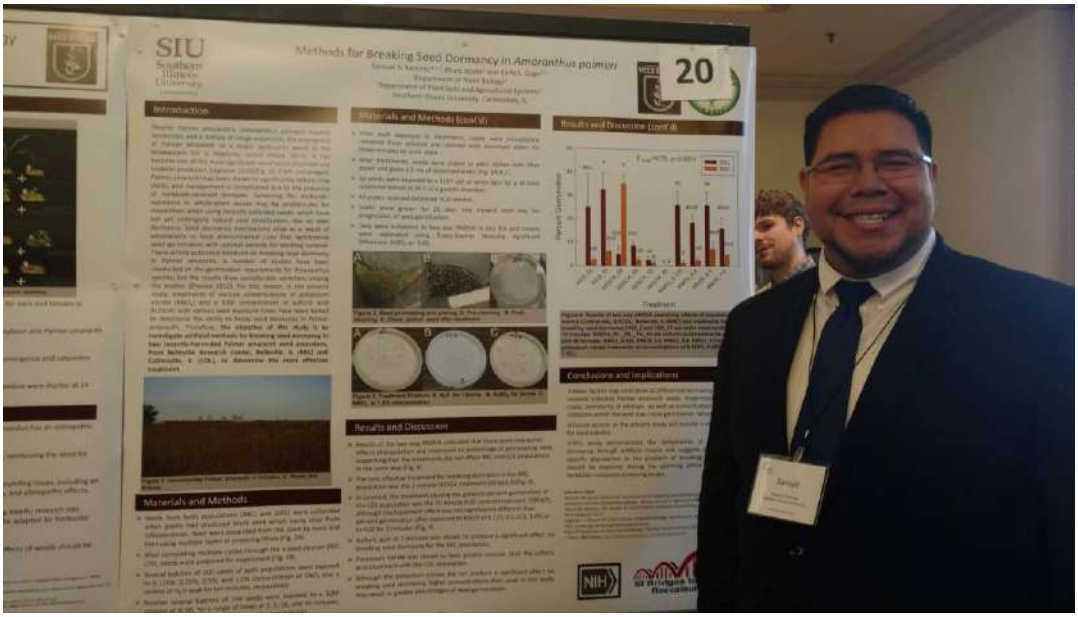
Arrowsmith in Toronto. He prepared a database that contained MRI cortical reconstruction information generated from Freesurfer. In the process, he has successfully written scripts to run all MRI scans that help compile into a master list. He observed that the posterior middle section of the corpus callosum is narrow in autistic children than in control. Aaron will be graduating from SCC with an Associates in Nursing and plans to transfer to SIUE in Fall 2018 to pursue a degree in nursing.

Dustin Bierbaum

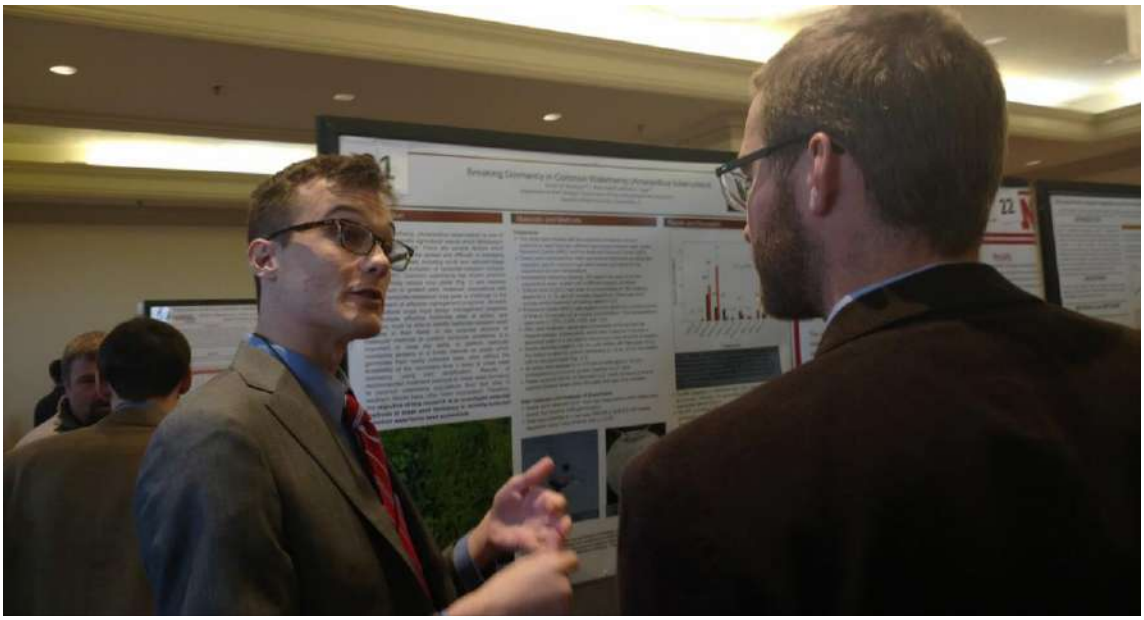
SIB scholar Dustin Bierbaum, a biological science student from SCC, is currently working with mentor **Karla Gage**, Assistant Professor of Plant Soil and Agricultural Systems and Plant Biology. They are working toward artificial methods for breaking seed dormancy in Common waterhemp. Like Palmer amaranth, common waterhemp has also been shown to significantly reduce crop yield, due to the presence of herbicide-resistance biotypes. Hence, the goal of this study was to collect and clean plant seeds from two different areas- Belleville (BRC) and Kuehn (KRC). The seeds were subjected to two different treatments- 10M sulfuric acid (H_2SO_4) at different time intervals and different concentration of potassium nitrate (KNO_3) for 10 minutes. Through his research, Dustin observed that seeds soaked in H_2SO_4 for 2 minutes produced the highest germination rate in both BRC and KRC population. On the other hand, nitric acid treatment did not show any significant effect on seed germination irrespective of the population. Thus, this study suggests that population-specific approaches to breaking seed dormancy are necessary. He recently had the opportunity to present his research in North Central Weed Science Society (NCWSS) 2017 Annual Meeting. This research aid in designing effective and timely management programs for the control of common waterhemp in agricultural fields. Dustin will be continuing his research with Dr. Gage in Spring with plans to transfer to SIUC where he will pursue a degree in a field associated with biological, chemical, and ecological sciences.

The SI Bridges to Baccalaureate program would like to extend a special thank you to all the mentors for providing our SI Bridges scholars the opportunity of working in their lab. We highly appreciate your time and resources that have greatly benefitted our scholars and is instrumental in their success.

To learn more about the SI Bridges to Baccalaureate program, please visit sibridges.siu.edu or contact your community college representatives-Lori Armstrong for SCC and Donna Ford for JALC.



Samuel Ramirez won the 2nd place in the Weed Biology and Ecology undergraduate poster competition with his research project "Methods for breaking seed dormancy in *Amaranthus palmeri*" in NCWSS 2017 Annual Meeting held on December 4-7, 2017 at the Arch in St. Louis, MO.



Dustin Bierbaum presenting his research on "Breaking dormancy in Common Waterhemp (*Amaranthus tuberculatus*) in NCWSS 2017 Annual Meeting held on December 4-7, 2017 at the Arch in St. Louis, MO.

Congratulations to Baylen Earles (SIB scholar from cohort 1) on graduating from SIUC in Fall 2017 with a major in biological sciences with a minor in chemistry.

Congratulations to Alysha Giltner (SIB scholar from cohort 4) on receiving the McNair Scholars Program at SEMO (Southeast Missouri State University). Alysha is attending SEMO on the Midwest Achievement Award and Outstanding Community College Scholarship.

Announcements

Join the SI Bridges RSO

This RSO aims to welcome and support students who transfer to SIU from community colleges. To take benefits of the numerous opportunity from this organization, join at https://orgsync.com/155871/chapter

SIGMA XI- The Scientific Research Society

SIU Undergraduates and Graduates are welcomed to join the Sigma Xi honor society for science and engineering researchers. It is an international society that promotes science and honors scientific achievements. Every year the society provides numerous international and local awards, scholarships, grants, and programs.

To become a Sigma Xi member, one needs to complete the nomination form at their website and submit it to Dr. Justin Schoof, Sigma Xi Secretary. The nomination form and information about the society can be located at their website http://sigmaxi.siu.edu/text.html

Transfer Student Scholarship

For SI Bridges students that plan to transfer to SIUC in Fall 2018, there are several exciting scholarships.

1) Dean's Transfer Scholarship-
Eligibility- A cumulative grade-point average of at least 3.50 GPA (4.0=A). Awarding begins in August and continues until all funds have been awarded.
Award amount: $2500/year (total value of $5000).

2) Phi Theta Kappa Scholarship-

Transfer students who have been members of Phi Theta Kappa for one academic year and will transfer with at least a 3.50 GPA (4.0=A) are eligible to compete for the PTK Scholarship Award. Awarding begins March 1. To be considered for the PTK award, you must first be awarded the Dean's Transfer Scholarship.
Award amount -$500 for the first year.

More information about these scholarships and other can be found at http://scholarships.siu.edu/types/transfer/index.php

Upcoming Event

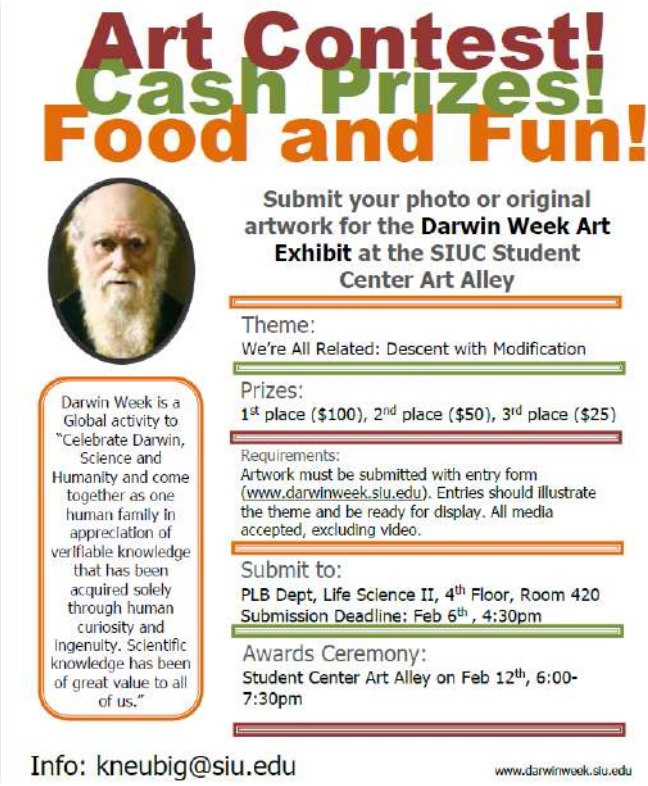
DARWIN WEEK

Celebrate the life and work of Charles Darwin at SIUC in the form of Darwin Week. The week will consist of various events such as public lectures, films, panel discussions and art competitions. The overall goal of these events is to promote science and evolution through open dialog and interaction. More details on the upcoming activities on 2018 Darwin Week will be released soon.

Dr. Jonathan Losos, Professor of Biology at Washington University in St Louis will be the keynote speaker. The primary focus of his research is on the behavioral and evolutionary ecology of lizards, especially Caribbean Anolis lizards. The SI Bridges scholar will have the opportunity to interact with Dr. Losos at dinner after his lecture.

Art contest (in the form of photos or original drawings) for the Darwin Week Art Exhibit is currently undergoing. The art piece should be representative of some aspect of biology and preferably the work of Charles Darwin such as evolution, species diversity, convergences, adaptation and/or selection. Prizes will be awarded for the best artwork. For more information, please refer to the attached flyer or contact Dr. Kurt Neubig at kneubig@siu.edu.

Darwin Week is sponsored by Center for Ecology, Vice Chancellor for Research, Office of the Provost, Sigma Xi, SIU School of Medicine, College of Science and the Departments of Geology, Microbiology, Plant Biology, and Zoology.



Life Science II 476
Southern Illinois University
1125 Lincoln Dr.
Carbondale, IL 62901

We welcome any research related photos, original articles, news or announcements.

Email to laxmi@siu.edu or visit sibridges.siu.edu with questions and feedback.