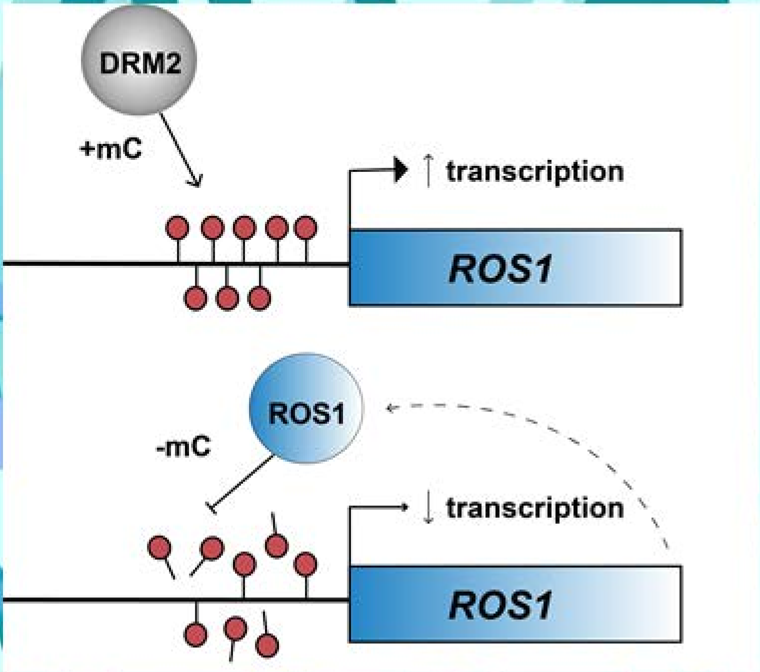
2022 Gilliam Seminar Series

Dr. Clara Williams (She/Her)
Postdoc, University of California, Berkeley

Identifying Demethylase Transcriptional Regulators

Mon. 4th of April 2022 12-1PM PST HCK132



Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

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Methylation of cytosine is an epigenetic change that can alter the accessibility and expression of a gene without changing the DNA sequence, thus enabling plants to dynamically change the context in which the DNA is read. Methylation levels are monitored by demethylases, which act as glycosylases and remove methylated cytosines. The gene encoding ROS1, a demethylase, acts as an epigenetic rheostat—DNA methylation levels at the ROS1 transcriptional start site dictate ROS1 expression levels. This generates a feedback loop where the cell may use ROS1 to sense and maintain stable methylation levels. Yet, it is unknown how methylation status at the ROS1 promoter influences binding of transcriptional regulators. The "rheostat" promoter region of ROS1 contains evolutionary conserved E2F cis-regulatory elements. The E2Fs are a well studied transcription factor family that regulates the cell cycle and may play a key role in regulating methylation during cellular division. To identify transcriptional regulation of demethylation genes we are utilizing an in vivo DNA binding assay to determine where in the genome all six E2F transcription factor family proteins bind. I also aim to determine how methylation affects binding of specific E2F proteins by developing methods to assay the methylation-sensitivity of transcription factors in vivo. Ultimately, my research will uncover precise mechanisms and regulatory networks that link dynamic epigenetic mechanisms to cell cycle control.

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2022 Gilliam Seminar Series

Dr. Clara Williams (She/Her)

Postdoc, University of California, Berkeley

Standing on the top of Trees

Tues. 5th of April 2022 12-1PM PST LSB 201

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

The most beneficial advancements in my career came through conversations and discussions I had with my mentors. It has been found that parental occupation can influence a minority student's likelihood to pursue a degree in a STEM field. Neither of my parents attended a four year university and could not give me any guidance as I began my college career. However, I was able to find guidance through my mentors. This is not a unique experience as minority parents are less likely to hold a PhD or other higher degrees. Given that in the current atmosphere you have a four times greater chance of earning a PhD if your parents have one, there needs to be some effort to compensate for the advantages some of us are not born into. My mentors acted as trees enabling me to gain a greater perspective on what I was capable of. Now, as I begin to plant my own roots, I hope that I can do for others what my mentors were able to do for me and uplift students above the canopy to see the opportunities out there for them.

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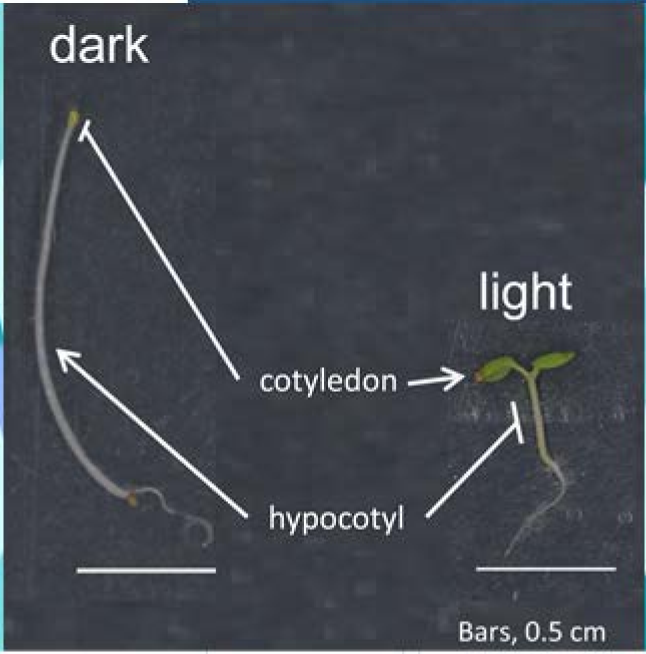
2022 Gilliam Seminar Series

Prof. Beronda Montgomery (She/Her)

Vice President for Academic Affairs and Dean,
Grinnell College

Seeing The Light: Plant Color Vision and Developmental Acclimation

Tues. 19th of April 2022 12-1PM PST LSB 201



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Photosynthetic organisms depend upon light for carbon fixation and production of reductant. Plants and other photosynthetic organisms have diverse mechanisms for light perception and exhibit a number of metabolic and developmental photoresponses. Notably, light exposure results in distinct responses in specific seedling tissues during photomorphogenesis. Light promotes growth of cotyledons and leaves, as well as development and elongation of roots, whereas light inhibits elongation of hypocotyls. Prior physiological studies resulted in the identification of spatially distinct photoreceptor pools that control such discrete aspects of light-dependent growth and development in plants. Despite significant advances in our understanding of the mechanisms of phytochrome synthesis and signaling, molecular evidence about spatial-specific phytochrome signaling is limited. To gain molecular insight into organ- and tissue-specific photoresponses, we initiated transgenic plant studies in Arabidopsis thaliana to regulate the spatial accumulation of photoactive phytochromes. We are investigating the phenotypic consequences of cell- and tissue-specific phytochrome deficiencies and have identified novel aspects of phytochrome signaling.

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2022 Gilliam Seminar Series

Prof. Beronda Montgomery (She/Her)

Vice President for Academic Affairs and Dean,
Grinnell College

Lessons from Plants on Human Thriving

Wed. 20th of April 2022 12-1PM PST HCK132

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Dr. Beronda L. Montgomery uses "Lessons from Plants" to share plant-based knowledge and to develop and disseminate accessible lessons on the awareness and adaptability of plants. In this talk, Dr. Montgomery discusses insights on mentoring, equity, and promoting change in community drawn from her recent book Lessons from Plants (Harvard University Press, 2021).

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Dr. Jonelle Basso (She/Her)

Postdoc, Lawrence Berkeley National Laboratory,
DOE Joint Genome Institute

Assessment of viral influence on plant root colonization by plant growth promoting rhizobacteria

Mon. 9th of May 2022 12-1PM PST HCK132

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Beneficial members of the plant microbiome can increase nutrient availability for their hosts, protect their hosts against pathogens, and enhance host resilience against abiotic stress. While previous and ongoing studies of the rhizosphere microbiome have been critical for assessing the impact of specific plant-microbe interactions, their focus has overwhelmingly targeted bacterial and fungal members of the microbiome. Viruses are ubiquitous, outnumbering all other biological entities on the planet, yet they are remarkably understudied in the rhizosphere. Prior work from our group identified functional roles for hundreds of genes in a plant growth promoting rhizobacterium *Pseudomonas simiae* that are important for its colonization of the rhizosphere. Two of these genes that cause reduced fitness in the rhizosphere when mutated are components of a latent bacteriophage and are present among three phage loci ranging in size from 15-65kbp. We observed significant differences in bacterial cell lysis and fluorescently stained populations upon mitomycin c induction and flow cytometry respectively, between induced and control cultures over a 24-hour period. Taken together, these findings suggest the possibility that bacteriophages are involved in modulating the ability of bacteria to colonize plants. The quantitative impact of these phage genes on root colonization and the molecular underpinnings of this presumptive plant-bacterial-phage interaction are currently being investigated.

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2022 Gilliam Seminar Series

Dr. Jonelle Basso (She/Her)

Postdoc, Lawrence Berkeley National Laboratory,
DOE Joint Genome Institute

The intersectionality of mentorship and resilience within the academic landscape

Tues. 10th of May 2022 12-1PM PST LSB 201

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Resilience can be described as the capability to recover quickly from adversity, where one taps into strengths from within, and obtains assistance from support systems to help overcome these challenges. Though mentorship actively helps develop proactive and resourceful responses to adversity, many persons, particularly identifying within underrepresented or marginalized groups lack this resource of allyship and community within the academic landscape. Furthermore, these persons may need to overcome more cultural adversity and emotional states mirroring a lack of confidence, acceptance, or contribution, which may ultimately lead to their elimination from the academe. In this talk, I will present ways in which mentorship can be a proactive and protective factor that helps create a more inclusive environment through building connections and improving a sense of purpose. The social interactions rooted in peer mentorship for example, can provide a safe space for sharing and receiving knowledge. Mentorship within affinity groups can support empowerment and lead to discussion on common felt states of mind, such as imposter syndrome. By enhancing the clarity of identity, self-awareness and presence of a trustworthy community, all persons can have a better chance for academic achievement and personal success.

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Prof. Terri Long (She/Her)

Associate Professor, North Carolina State University

Iron at the intersection of development and multi-stress resilience

Mon. 16th of May 2022 12-1PM PST HCK132

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Iron (Fe) is an essential micronutrient that plays critical roles in central metabolic plant processes such as photosynthesis and respiration. The mechanisms by which plants maintain Fe homeostasis are particularly intriguing. While it is relatively abundant, in most soils Fe is insoluble and therefore of limited bioavailability, however excess Fe accumulation in plants can lead to cellular damage. Thus, plants must extract sufficient Fe from recalcitrant growth environments, while also ensuring that Fe content does not exceed a specific range. Arabidopsis and other dicots have developed mechanisms to sense Fe deficiency in the shoot, which triggers roots to solubilize, reduce and uptake Fe across multiple root cell types before transport to the shoot. We have uncovered several molecular mechanisms that control how plants recognize and respond to iron deficiency stress and found new evidence for how specific cell types within the root are involved in these processes. Considering how critical Fe is for overall plant health, it is no surprise that these mechanisms also impact responses to a range of other abiotic and biotic stress conditions.

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2022 Gilliam Seminar Series

Prof. Terri Long (She/Her)

Associate Professor, North Carolina State University

Black in Plant Biology – A Perspective

Tues. 17th of May 2022 12-1PM PSTLSB 201

Hosted by Prof. Jennifer Nemhauser and Román Ramos Báez in partnership with the UW Biology DEC.

2022 Gilliam Seminar Series

Population increases, environmental perturbations, and economic and geographical challenges are but a few of the many barriers facing concerted efforts to feed and fuel the global population. Innovation and collaboration are needed to overcome these challenges. Studies have shown that diverse teams are more productive and creative than homogenous teams. However, Persons Excluded because of their Ethnicity or Race (PEERs), are a particularly undervalued pool of creativity in STEM fields. In the US, PEERS who choose careers in STEM, infrequently select plant biology, which is ironic given the close cultural ties that members of these and other marginalized populations have historically had with the land and plants. Consequently, Black, Latine and Indigenous scientists makes up a marginal portion of membership within established national organizations such as the American Society of Plant Biologists and the Botanical Society of America. Following the models of the National Society of Black Engineers, is there a need for a national society for Black, Latine and Indigenous scientists to support and expand the burgeoning body of minoritized plant scientists or can we work within established organizations to truly make the field more diverse and inclusive? Could these same arguments be made for other STEM fields?

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