ANNUAL REPORT FISCAL YEAR 2023-2024

MICHIGAN STATE
U N I V E R S I T YPLANT
RESILIENCE
INSTITUTE

Prepared by the PRI Administration Team:

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PLANT PLANT RESILIENCE NSTITUTE

The <u>Plant Resilience Institute (PRI)</u> at Michigan State University (MSU) was launched in 2016 as part of <u>MSU's Global Impact</u> <u>Initiative</u>. Dr. Seung Yon "Sue" Rhee assumed the position of PRI Director on July 1, 2023.

A MESSAGE FROM THE DIRECTOR



As we stand at the precipice of unprecedented climate fluctuations and environmental challenges, there has never been a greater need for plant resilience research.

It is my honor to serve as PRI Director, working in a collaborative environment dedicated to advancing plant resilience through innovative ideas and scientific excellence.

Together, we will continue our pursuit of bold research that transcends traditional disciplinary boundaries. Together, we will address complex challenges and create solutions that benefit society as a whole. **Together, we are PRI.**

Sury Y. Phan

Seung Yon "Sue" Rhee, PhD Director, Plant Resilience Institute, Michigan State University

VISION

To be a distinguished institute that conducts **cutting-edge** plant resilience research in a lively, **collaborative environment** that attracts **diverse** talent.

MISSION

To be a "Center of Excellence" known for ground-breaking laboratory and field research, where future leaders are trained and the importance of plant resiliency is advocated for and prioritized.

VALUES

PRI values **professionalism, collegiality, and respect** in a collaborative work setting to facilitate plant resilience research with **rigorous** and **high ethical standards**.



Fig. 1 Each line of the circos plot indicates a collaboration between PRI labs, such as developing grants, coadvising students and postdoctoral researchers, working together on research, and co-authoring papers. Acronyms outside of the boxes represent the academic departments of faculty. Figure credit: Tanya Bakija



FACULTY

Lundquist won an NSF Career grant in 2024 and received the Arthur C. Neish Young Investigator Award from the Phytochemical Society of North America in 2023, Sprunger was named an Ecological Society of America Early Career Fellow, Rhee won the 2024 Society for Experimental Biologists' Woolhouse Plenary Lectureship, Thompson 3 won the Emerging Leader in Plant Sciences from the University of Minnesota, and **Gilbert** was named the Eric E. Conn Young Investigator Award from ASPB.

POSTDOCS

Ian Gilman won the NSF-PGRP postdoctoral fellowship and **Karine Prado** won the 2024 MSU MTRAC AgBio Innovation Challenge Award.

GRAD STUDENTS

Asia Hightower won the Smithsonian Institution Fellowship for 2024-2025 and a Graduate Student Poster Award Honorable Mention at the Evolution meeting in 2024, Magie Williams won an MSU Plant Sciences Fellowship and EEB Engagement Fellowship, Rachel Drobnak and Sylvie Martin-Eberhardt won NSF Graduate Research Fellowships, Bailey Kleven received the 2024 Keegstra and Thomashow Travel Award to attend ICAR 2024, Robert Shrote won the Elmer C. Rossman Endowed Graduate Student Support Award and the Jason and Dana Lilly PBGB Fund for Graduate Student Enhancement in 2024, Brandon Webster won the PBGB Endowment for Graduate Student Enhancement in 2024, Sylvie Martin-Eberhardt and Cristal Lopez-Gonzalez won the EEB Professional Horizons Grant Awards, and **Daniel Mok** won the KBS-LTER Graduate Fellowship and BSA Graduate Student Research Award.

UNDERGRAD & POST-BACHELOR'S STUDENTS

Alethia Pratas da Costa Braun won the ASPB Summer Undergraduate Research Fellowship in 2024, **Kiara Chalker** won the First Place Poster Award at MSU's University Undergraduate Research and Arts Forum in 2024, and **Will Dwyer** won the Knight-Hennessy Graduate Student Fellowship at Stanford University in 2024.

SEED GRANT PROGRAM

To encourage PRI trainees (students and postdoctoral researchers) to collaborate across PRI labs, PRI launched a Seed Grant program in September 2023. This program is offered twice a year to current PRI trainees and provides grants of up to **\$10,000** for up to one year for cutting-edge experimental projects. **Nine grants** were awarded this fiscal year, and the awardees are as follows:

FIRST ROUND

- Andrew Bleich, a graduate student in the Lowry lab, collaborated with another graduate student, Asia Hightower from the Josephs lab, to study the impact of habitat loss on genetic diversity in switchgrass populations and other tallgrass prairie species.
- Dr. Kangmei Zhao, a postdoctoral researcher in the Rhee lab, collaborated with two other postdoctoral researchers, Drs.
 Danielle Hoffmann (Rhee lab) and Jian Yao (Howe lab), to investigate the balance between growth and defense mechanisms during pathogen attacks in Arabidopsis.
- **Dr. Ian Gilman**, a postdoctoral researcher in the VanBuren lab, used a pioneering technique, single-cell technologies, to explore the genetic and regulatory networks of C4 and CAM photosynthesis in Portulaca.





SECOND ROUND

- **Dr. Hui-Kyong Cho**, a postdoctoral researcher in the Rouached lab, proposed to use quantitative genetic approaches to understand the sensing and signaling systems in plants that enable adaptation to low oxygen (O₂) stress.
- Shannon Donelly, a graduate student in the Lundquist lab, collaborated with her undergraduate student, Kiara Chalker, and Bailey Kleven, a graduate student in the Howe lab, to investigate the balance between growth and defense mechanisms during pathogen attacks in Arabidopsis.
- Syvie Martin-Eberhardt, a graduate student in the Gilbert lab, collaborated with another graduate student, Madison Plunkert from the Lowry lab, to address a novel research question regarding the role of anthocyanins in protecting extrafloral nectaries (EFNs) from fungal infection, which has not been extensively studied before.
- **Daniel Mok**, a graduate student in the Gilbert lab, collaborated with **Dr. Ian Gilman**, a postdoctoral researcher from the VanBuren lab, to study drought resilience in carnivorous plants, specifically Pinguicula.
- **Dr. Mohammad Mostafa**, a postdoctoral researcher in the Sharkey lab, proposed to explore isoprene roles in conferring climate resilience in soybean.
- Dr. Tri Tran, a postdoctoral researcher in the Lebeis lab, proposed to investigate the influence of Soy Bio ST+R on droughtresponsive metabolites and root-associated microbial communities in soybeans.

TRAVEL GRANTS

To facilitate access to valuable conference opportunities worldwide, PRI provided travel grants of up to **\$500** to trainees (students and postdoctoral researchers) who wished to give oral or poster presentations at an upcoming conference this fiscal year. The awardees are as follows:



- **Dr. Sahu Abira**, a postdoctoral researcher in the Sharkey lab, attended ASPB Plant Biology 2023 to give a poster presentation.
- **Dr. Anuradha Singh**, a postdoctoral researcher in the Thompson lab, attended ASPB Plant Biology 2023 to give a poster presentation.
- Dr. Ying Sheng, a postdoctoral researcher in the Lundquist lab, attended the ASA/CSSA/SSSA Annual Conference to give a poster presentation.
- **Sophie Byusse**, a graduate student in the Josephs lab, attended Botany 2024 to give a poster presentation.
- **Mia Gaughan**, an undergraduate student in the Gilbert lab, attended Botany 2024 to give an oral presentation.
- **Sylvie Martin-Eberhardt**, a graduate student in the Gilbert lab, attended Botany 2024 to give a poster presentation.
- **Dr. Matt Stata**, a postdoctoral researcher in the Rhee lab, attended Botany 2024 to give a poster presentation.
- **Dr. Cristal López González**, a postdoctoral researcher in the Gilbert lab, attended ASPB Plant Biology 2024 to give a poster presentation.

SEMINAR SERIES AND NETWORKING HOURS

To provide an opportunity for members to **share their experiments and practice giving job talks**, PRI launched an internal seminar series in September 2023. This series was eventually restructured and renamed to the <u>PRI Networking Hour</u>. The topics and speakers are suggested by trainees, and the invited guests speak about **career development opportunities**.

BLACK HISTORY MONTH BOTANISTS EXHIBIT

To celebrate Black History Month, PRI collaborated with <u>Plant Cell</u> <u>Atlas (PCA)</u> to present an art exhibit showcasing **historically significant Black scholars in plant science**. Displayed in the Molecular Plant Science (MPS) building at MSU in February 2024, each banner included a brief biography and artwork by Maxwell Eckelbarger.



Banners celebrating notable Black plant scientists were displayed in the MPS atrium in February 2024. Photo credit: Tanya Bakija

GLENCAIRN ELEMENTARY SCHOOL SCIENCE NIGHT

Dr. Charles Hawkins of the Rhee lab organized an outreach activity at Glencairn Elementary School's Science Night in East Lansing where engaged he with approximately 50 elementary students through interactive demonstrations plant on metabolism.



Dr. Hawkins educated elementary students on plant metabolism. Photo credit: Rebekah Sloup



BUDDING IDEAS AND BLOOMING CONNECTIONS AT THE FIRST PRI ALL-HANDS RETREAT

The inaugural Plant Resilience Institute (PRI) All-Hands Retreat was held from October 5-7, 2023, at the picturesque <u>W.K. Kellogg</u> <u>Biological Station</u>. The event marked a significant milestone for PRI, bringing together a vibrant community of researchers, faculty, and students to foster collaboration and innovation in plant science.

PRI Director Seung Yon "Sue" Rhee elaborated, "We aimed to cultivate a space where collaboration and creativity could thrive, ultimately advancing our mission to enhance plant resilience efforts."

The retreat featured a dynamic mix of activities designed to promote interaction, learning, and ingenuity.

Dr. M. Jahi Johnson-Chappell, director of the <u>Michigan State</u> <u>University Center for Regional Food Systems</u>, gave the keynote presentation on participatory, socially just, and ecologically sustainable agrifood systems that are an alliance between farmers, laborers, and the communities they serve.

The retreat was attended by more than 80 people, and the exit survey results indicated that the retreat largely met or exceeded participants' expectations. The success of the first PRI All-Hands Retreat underscores the importance of such gatherings in fostering a vibrant and collaborative scientific community.

"The ideas and connections generated during this retreat will be

instrumental in shaping the future direction of PRI's research and initiatives," Rhee said.

In order to build on the success from last year, the 2024 PRI All-Hands Retreat, which will be combined with a <u>Scientific Advisory Board</u> <u>meeting with PRI's new board members</u>, will be held from September 19-20 at the James B. Henry Center for Executive Development.



Members of the PRI labs together at the retreat. Photos credit: Aran Kessler



CULTIVATING COLLABORATION: THE FIRST INTERNATIONAL SUMMIT ON PLANT RESILIENCE

The Plant Resilience Institute (PRI) hosted an international cohort of plant science thought leaders and center directors for a summit on plant resilience this past May. The <u>First International</u> <u>Summit on Plant Resilience</u> gave PRI members and the greater Michigan State University community the opportunity to



Fig. 2 Invited speakers from eleven countries gathered at the First International Summit on Plant Resilience in East Lansing in 2024.

attend presentations by some of the world's preeminent plant scientists across various disciplines and institutions, share their latest work in a poster session, and take part in breakout group discussions designed to encourage synthesis and collaboration. Guests traveled to East Lansing from as far as Australia and Ghana to attend, with a total of 210 participants from eleven countries (**Fig. 2**).

PRI Director Dr. Seung Yon "Sue" Rhee welcomed participants to the summit by saying, "As we stand at the precipice of unprecedented climate fluctuations and environmental challenges, there has never been a more pressing need for plant resilience research. My hope is that this summit will ignite a spirited exchange of research and ideas, foster international collaboration, and chart a course towards advancing plant resilience." Dr. Michelle Heck, a Research Molecular Biologist at the USDA-ARS Robert W. Holley Center and an Associate Professor at the Boyce Thompson Institute, gave the keynote presentation. Her talk, titled "Plant Resilience in the Face of Citrus Greening Disease- Is This Possible?" addressed the critical challenges posed by citrus greening disease, a devastating condition for which there is currently no cure or accessible prevention method. She emphasized the importance of viewing growers as collaborative research partners, recognizing their expertise in plant resilience and practical insights into effective treatment methods.

Throughout the summit, participants were encouraged to reflect on their aspirations for the future of plant resilience research. The most prominent response was the desire for increased collaboration, a sentiment that also emerged as the primary reason for their excitement about attending the summit (**Fig. 3**).



Fig. 3 Participants reflected on their aspirations for the future of plant resilience research and why they were most excited to attend the summit. Their answers were formatted into word clouds, and "collaboration" emerged as the most common answer for both questions.

Reflecting on the event, Dr. Rhee expressed her optimism, saying, "I am hopeful that the spirit of collaboration we have fostered here will continue to strengthen, enabling us to tackle plant resilience efforts as a global community."

The exit survey reflected the event's success, with 98% of the 51 participants who responded reporting that they were extremely or very satisfied with the summit and are extremely or very likely to attend the next summit on plant resilience. Organization for the next summit is already in motion, with plans for the Boyce Thompson Institute to host the event in 2026.



PRI CELEBRATES FIRST COHORT OF POSTDOCTORAL FELLOWS EMBARKING ON NEW VENTURES

The Plant Resilience Institute (PRI) proudly announces that its first cohort of postdoctoral research fellows is moving on to new and exciting roles after three transformative years. These talented plant scientists—Drs. Daniel Anstett, Brittni Kelley, and Stephanie Schmiege —have made significant contributions to plant resilience research and are now set to continue their impactful work in new positions.

Dr. Daniel Anstett (pictured above on the left) has accepted a role as an assistant professor in the School of Integrative Plant Science at Cornell University, where he will establish his own lab. During his tenure as a PRI fellow, Daniel was co-advised by Drs. Lowry and Wetzel (prior PRI faculty member who left MSU), focusing on evolutionary ecology. Reflecting on his journey, Daniel emphasizes the importance of determination, noting that his seven years as a postdoc taught him that good science takes time. He fondly recalls helping with the Lowry lab switchgrass harvest, hilariously tackling the enormous plants in order to tie them together. Professionally, he values the mentorship he received, which helped him secure his dream faculty job. Daniel hopes to foster an environment similar to that of PRI in his own lab, saying, "I envision my lab to be an interdisciplinary space for trainees from different academic and personal backgrounds to meet and work on innovative climate change research together." Daniel's advice to aspiring researchers is straightforward: "Don't give up! If you really want that faculty job, go for it."

Dr. Brittni Kelley (pictured in the center) is transitioning to a position as an instructor of microbiology at Athens Technical College. At PRI, she researched microbiology in the Lebeis and Day (prior PRI faculty member who left MSU) labs. Brittni appreciates PRI's co-mentoring aspect, which allowed her to gain experience across various labs. "My time at PRI has given me the opportunity to expand my research questions and a greater appreciation for applied science," she noted. Brittni adds that PRI taught her the importance of collaboration and asking for help when you need it, which are crucial for scientific arowth. Brittni's memorable moments include organizing the inaugural PRI All-Hands Retreat and presenting during PRI Networking Hour, which she says helped her build confidence. Brittni encourages new researchers to remain open to fresh ideas and techniques, saying, "Your research can start in one direction, but if you are willing to try new things, it can take you in exciting new directions."

Dr. Stephanie Schmiege (pictured on the right) will join Union College as an assistant professor of biological sciences in January 2025 after working at the University of Michigan Institute of Global Change Biology. Stephanie worked in the Sharkey, Walker (MSU-DOE Plant Research Laboratory), and Way (Australian National University) labs, studying plant physiological responses to climate change. Stephanie appreciates the diverse research methods she learned at PRI, making her a more versatile scientist. She is particularly excited to continue her research in the Arctic exploring the effects of environmental stress on tundra plant respiration. Grateful for her mentorship under Tom Sharkey and Berkley Walker, Stephanie looks forward to working with students of her own to spark interest in plant resilience efforts in the next generation of scientists. Her advice to incoming researchers is, "Ask tons of questions! Your colleagues and collaborators have a wealth of information and wisdom to offer. Take the time to build those connections!"

The first cohort of postdoctoral fellows exemplifies PRI's mission to foster innovative research and collaboration in plant resilience efforts. The PRI community celebrates the achievements of Daniel, Brittni, and Stephanie and wishes them continued success in their future endeavors!



GERMPLASM CURATOR PAIGE SMITH: SOWING THE SEEDS OF PLANT RESILIENCE

Paige Smith, the Plant Resilience Institute (PRI) Germplasm Curator, plays an integral role in advancing agricultural science, biodiversity conservation, and food security research at PRI. Her responsibilities encompass the meticulous management, preservation, and transfer of plant genetic resources, commonly referred to as germplasm. Given PRI's collaborative and cross-disciplinary research approach, Paige's work ensures the preservation of vital resources and information within the seed collections. Her duties include importing and exporting seeds to and from MSU, assisting with seed bulking of different species, and preparing for the development of the PRI Germplasm Database and centralized seed storage facility.

"In my opinion, seeds are the most important part of plant research," said Paige. "This position is vital just to have an extra set of hands dedicated to making sure different seed collections used by PRI are well maintained, organized, shared, and stored." Paige's contributions extend across multiple labs within PRI. In the Lowry Lab, Paige compiled and qualitychecked the field collection master spreadsheet for the flowering plant genus Mimulus (monkeyflowers) using data from several Mimulus labs across the country. She is currently growing two of every *Mimulus* accession to bulk the collection of each seed type. Additionally, Paige has acquired a permit for field collection of Mimulus michiganensis, a species presumed to be endemic to Michigan.



Paige pollinates the monkeyflowers by hand with tweezers. Photo credit: Morgan Koetje

Paige also created a germplasm collection for the VanBuren lab's 2021 and 2022 *Eragrostis tef* harvests, a cereal crop cultivated in Ethiopia that is high in iron and other nutrients and can grow with imperfect conditions. Each harvest consisted of three replicates of 265 accessions. She ensured that the collected panicles were weighed, threshed, and re-weighed to record seed weight. The seeds were then cleaned using a seed blower, with one gram packaged into tubes for genomic analysis. All seed bags were organized numerically and placed in bins for optimal long-term storage. Paige also photographed seeds from each packet to document their size and color, comparing them to USDA data for potential discrepancies.

"Moving forward, I hope that this role will be able to help store, oversee, and maintain any PRI lab's seed supply that would like the specialized help," said Paige.

A Michigan State University graduate, Paige holds a Bachelor of Science in zoology with a focus in ecology, evolution, and organismal biology. She first cultivated a passion for plant science while working as an undergraduate research assistant for Dr. Miranda Haus in the Department of Horticulture experimenting with *Phaseolus vulgaris* (the common bean). She eventually plans to pursue a PhD in evolutionary biology, continuing her dedication to plant research and conservation.



NURTURING THE NEXT GENERATION OF PLANT SCIENTISTS AT THE 2024 MSU SCIENCE FESTIVAL

This past April, several labs from the Plant Resilience Institute (PRI) participated in the <u>STEAM Expo Days</u> during the <u>MSU Science</u> <u>Festival</u>. The Howe, Lundquist, Rhee, Sharkey, and VanBuren labs engaged the public in the fascinating world of plant science through themed interactive exhibits. Each table displayed a banner of a brilliant Black scientist detailing their pioneering research. To encourage exploration, an activity passport was available at each booth, and participants who collected a stamp from every PRI exhibit received a box of crayons. Staffed by a team of 14 volunteers, the PRI presentations attracted 130-150 budding scientists each day.

Spearheaded by the Rhee lab, "Exploring Plant Cells", the <u>Plant Cell</u> <u>Atlas (PCA)</u> booth, allowed participants to delve into the microscopic world of plant cells. Using microscopes, participants examined plant tissues, such as red onion skins and corn leaves.

Also led by the Rhee lab, the Plant Metabolic Network (PMN) exhibit,

"Why Do Bananas Smell so A-Peeling?", explored the science of plant molecules responsible for the diverse flavors and scents in fruits. Volunteer scientists guided attendees through a puzzle game to match the smell and 3-D model of a molecule with fruits, such as bananas, peaches, and strawberries.



Hillary Fischer presents "Why Do Bananas Smell so A-Peeling?". Photo credit: Gaëlle Cassin-Ross

The VanBuren, Rhee, and Fleming (a faculty member in the Plant, Soil, and Microbial Sciences Department) labs collaborated to present the <u>Water and Life Interface Institute (WALII)</u> exhibit, "Life Without Water". This display provided insights into how plants and other organisms survive extreme water loss. The booth featured resurrection plants and tardigrades —also known as water bears which exemplify survival under desiccation.



Participants could use an an LI-COR gas analyzer to see photosynthesis in real-time. Photo credit: Kara Headley

The Sharkey and Walker (a faculty member in the Plant Biology Department) labs teamed up on "See Plants Grow in Real-Time!". This exhibit allowed participants to manipulate carbon dioxide and light levels to observe their effects on photosynthesis by using an LI-COR gas analyzer, a device to measure photosynthesis.

Lastly, the Howe and Lundquist labs participated in "The Wonderful World of Plants" to offer visitors a broad exploration of plant biology. Activities included examining plant cell functions, learning about plant diversity, and studying the effects of light and temperature on photosynthesis.

The MSU Science Festival served as an excellent platform for PRI researchers to share their passion for plant science and foster a greater understanding of plant resilience in the community. By sparking curiosity, wonder, and discovery in participants, PRI researchers are inspiring the next generation of plant scientists.

DIRECTORY

Faculty:

<u>Kadeem Gilbert</u>: Assistant Professor of Plant Biology <u>Gregg Howe</u>: University Distinguished Professor and MSU Foundation Professor of Biochemistry & Molecular Biology <u>Emily Josephs</u>: Assistant Professor of Plant Biology

Sarah Lebeis: Associate Professor of Plant, Soil & Microbial Sciences

<u>David Lowry</u>: Associate Professor of Plant Biology <u>Peter K. Lundquist</u>: Associate Professor of Biochemistry & Molecular Biology

<u>Seung Yon "Sue" Rhee</u>: MSU Foundation Professor of Biochemistry & Molecular Biology, Plant Biology, and Plant, Soil & Microbial Sciences

Hatem Rouached: Assistant Professor of Plant, Soil & Microbial Sciences

Thomas Sharkey: University Distinguished Professor of Biochemistry & Molecular Biology

<u>Christine Sprunger</u>: Assistant Professor of Plant, Soil & Microbial Sciences

Addie Thompson: Assistant Professor of Plant, Soil & Microbial Sciences

Robert VanBuren: Associate Professor of Horticulture

Scientific Advisory Board:

Richard A. Dixon: Distinguished Research Professor Emeritus at the University of North Texas and Visiting Lecturer at Texas A&M University

Mary Lou Guerinot: Professor at Dartmouth College and member of the U.S. National Academy of Sciences

Jan Leach: Research Associate Dean at Colorado State University Corné Pieterse: Professor at Utrecht University

Anne W. Sylvester: Director of Research at the Marine Biological Laboratory

Administrative Team:

Gaëlle Cassin-Ross: Outreach and Training Coordinator Morgan Koetje: Communications Coordinator Paige Smith: Germplasm Curator Amy Wild: Executive Secretary

Trainees:

Hussain Agha: Research Associate Daniel Anstett: Research Associate Gian "Nico" Bennuci: Data Analyst and Bioinformatician Andrew Bleich: Graduate Student Flavia Bossi: Senior Research Associate Elliot Braun: Graduate Student Sophia Buysse: Graduate Student Eleannor Carr: Graduate Student Nathan Catlin: Research Associate Kiara Chalker: Undergraduate Student Jeffrey Chen: Undergraduate Student Hui-Kyong Cho: Research Associate Ilyeong Choi: Research Associate Kyle Christie: Postdoctoral Fellow Maddy Creach: Graduate Student Megan DeLoose: Graduate Student Alex Demetros: Graduate Student Derek Denney: Postdoctoral Fellow Shannon Donnelly: Graduate Student Caitlin Dougherty: Undergraduate Student Rachel Drobnak: Graduate Student Joanna Feehan: Postdoctoral Fellow Sterling Field: Postdoctoral Fellow Jacob Gantz: Research Assistant Julia Gershon: Intern Ian Gilman: NSF-PGRP Postdoctoral Fellow Huijia Gong: Graduate Student Keara Grady: Research Assistant Britta Hamberger: Technician

Lisa Hargest: Research Technologist Charles Hawkins: Curator and Plant Metabolic Network Director Claire Henley: Research Technician Asia Hightower: Graduate Student Danielle Hoffmann: Research Associate Bethany Holland: Research Associate Jannis Jacobs: Technician April Kaneshiro: Research Associate Kap Kapoor: Intern Purva Karia: Postdoctoral Fellow Aidan Kile: Undergraduate Student Bailey Kleven: Graduate Student Ava Kloss-Schmidt: Research Assistant Leah Knoor: Graduate Student Leslie Kollar: Adjunct Postdoctoral Fellow Elena Lazarus: Assistant Scientific Coordinator Cristal Lopez Gonzalez: Postdoctoral Fellow Elle Mader: Undergraduate Student Mohit Mahey: Masters Student Meredith Mann: Lab Manager Liam Markell: Undergraduate Student Sylvie Martin-Eberhardt: Graduate Student Tvisha Martin: Graduate Student Cathy Mercado: Graduate Student Christina Miller: Research Associate Daniel Mok: Graduate Student Mohammad Golam Mostofa: Research Associate Ritta Mouayed: Undergraduate Student Madelyn Mulnix: Undergraduate Student Katherine Naasko: Research Associate Linsey Newton: Research Assistant Vincent Pan: Graduate Student Emily Parker: Research Assistant Imani Pascoe: Graduate Student Adrian Platts: Information Technologist Madison Plunkert: Graduate Student Karine Prado: Senior Research Associate Alethia Pratas da Costa Braun: Undergraduate Student Sidney Richardson: Technician Miles Roberts: Graduate Student Megan Ruffley: Postdoctoral Fellow Abria Sahu: Research Associate Evan Saldivar: Graduate Student Kevin Santiago-Morales: Graduate Student Ally Schumacher: Graduate Student Jenny Schuster: Graduate Student Bianca Serda: Graduate Student Robert Zachary Shrote: Graduate Student Anuradha Singh: Research Associate Alexa Smychkovich: Research Associate Gabbie Standstedt: Research Associate Lauren Stanley: Research Associate Matt Stata: Postdoctoral Fellow Abby Sulesky-Grieb: Postdoctoral Researcher Febri Susanto: Graduate Student Tri Tran: Postdoctoral Researcher Elisha Vil: Undergraduate Student Andrew Wade: Undergraduate Student **Gianjie Wang: Graduate Student** Brandon Webster: Graduate Student Carolina Wheeler: Undergraduate Student Magie Williams: Research Technician Maya Wilson Brown: Graduate Student Bo Xue: Programmer Jian Yao: Research Associate Andrew Yonker: Undergraduate Student

PUBLICATIONS

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