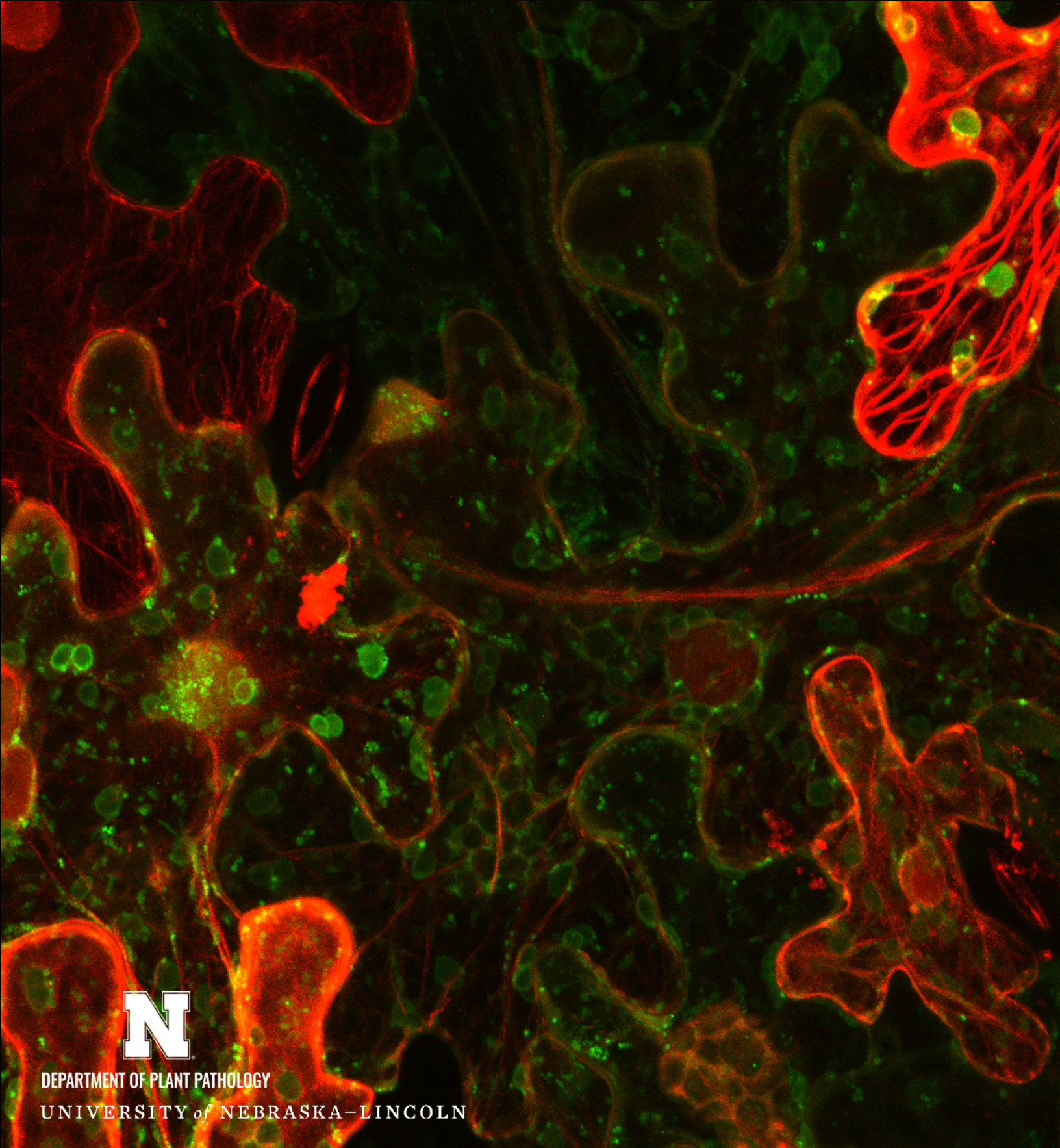


# PathogeNews

Department of Plant Pathology  
2023 Annual Newsletter



DEPARTMENT OF PLANT PATHOLOGY

UNIVERSITY of NEBRASKA-LINCOLN

# WE ARE NEBRASKA



JOIN US

Here in the Department of Plant Pathology, we're big on making big impacts. Our passion lies in solving challenges at the microbial level that affect sustainable plant productivity. And we do it all while training the next generation of plant pathologists.

We'd love to hear how an advanced degree in plant pathology from UNL will benefit you.

<https://plantpathology.unl.edu/>  
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DEPARTMENT OF PLANT PATHOLOGY

M.S. & Ph.D.  
Programs



[plantpathology.unl.edu/apply](https://plantpathology.unl.edu/apply)

Program Contact

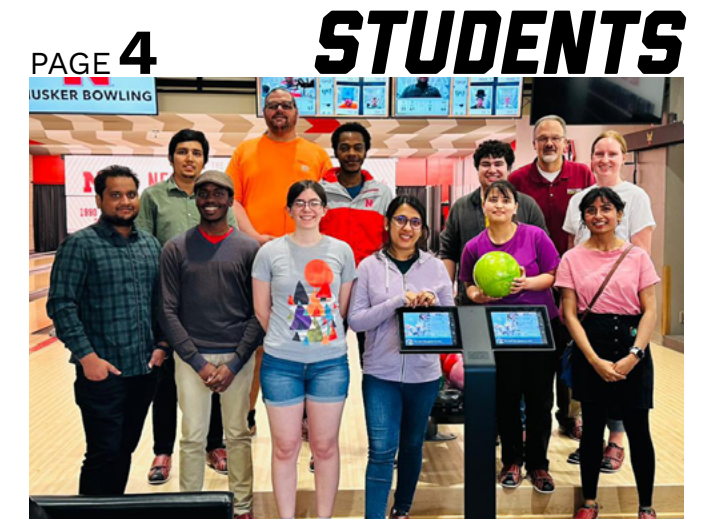


**Madilyn McKay**  
Graduate  
Coordinator

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**CLINIC  
UPDATES**

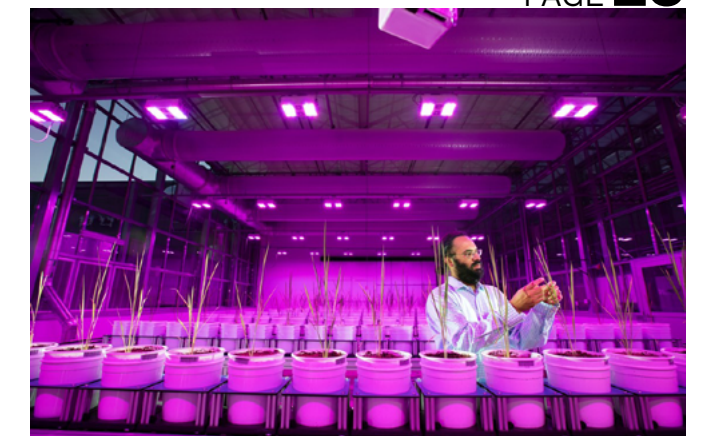
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**INCLUSIVE  
EXCELLENCE**

**PAGE 8**

**Front cover photo:** Plant cellular responses to the bacterial pathogen *Pseudomonas syringae* pv *tomato* can be visualized by laser scanning confocal microscopy. This picture shows a plant immune protein fused to the green fluorescent protein (green dots), moving through the actin cytoskeleton (structure to help plant cells maintain form and organization) that has been stained with mCherry (red lines), using tobacco as a model system. (Photo credit: Conner Chu)

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**COMPLEX BIOSYSTEMS**

PathogeNews is an annual publication from UNL's Department of Plant Pathology.  
Editor & Designer: Madilyn McKay  
Editor: Amber Hadenfeldt

All Lab Highlights were written by each respective PI. All photos are from faculty, staff, and students within the department, or from the UNL digital photo archive.



# Letter

**FROM THE HEAD OF THE DEPARTMENT  
DR. LOREN GIESLER**

Greetings from the Department of Plant Pathology at the University of Nebraska-Lincoln. In 2023, we had a year of change with a retirement and the addition of two new faculty to our plant pathology team. We are now a department with 14 tenure-line faculty, 4 of which having joined in the past year. This is an exciting time of turnover in our department and new program development. With the addition of new faculty comes the departmental responsibility to provide a supportive environment for mentorship, and my job is to remove any barriers that can be lifted along the way for all of our members. Being one of only 12 Departments of Plant Pathology in the U.S., I am so very proud of our faculty, staff, and students who focus on our field of science.

This year we are providing lab highlights from each program and spotlighting the success of all our team members. Our faculty do amazing work that collectively serves our three mission areas of extension, teaching, and research. The continuum of fundamental to applied research is clear among our team, and they all work to serve the greater mission of ensuring a sustainable and ample food and fiber supply to support our growing global population. This marked my fifth year as head of the department, and I completed the reappointment process with a passion to continue in this role for another 5 years. I continue to be humbled to serve in this capacity. Below are a few highlights from 2023.

- Dr. Rich Wilson was elected Fellow, American Association for the Advancement of Science.
- Dr. Tamra Jackson-Ziems received the Mid-Career Award, North Central Division of APS.
- Two new faculty started (Drs. Clemencia Rojas and Saet-Byul Kim).
- Our department supported 2 Ph.D. and 2 M.S. graduate degrees.
- Our students were recognized with 25+ local and national awards.
- Technologist Becky Higgins received the Lambrecht Award – this award is the result of an endowed foundation in memory of Patricia Lambrecht (Technologist for Anne Vidaver).
- Dr. Gary Yuen retired from his appointment as Professor after 33 years of service.
- Faculty secured over 1M in funding to support their programs in research and extension.
- Administrative Associate Amber Hadenfeldt received the inaugural Department Service Award.
- Dr. Tom Powers held a gallery event that highlighted photomicrographs of nematode diversity.

It has been wonderful to experience the energy in our department associated with our faculty and student growth. It is an exciting time to be part of our department. I was humbled to watch the process of my graduate advisor (Dr. Gary Yuen) retire from his position. The academic cycle was made clear to me in this action, and I continue to be amazed at the collective works we all do that change the lives of our students and stakeholders. For me, Dr. Yuen gave so much to me that resulted in the opportunity to develop into the scientist and leader I am – he always pushed me to be better. My goal now is to continue to give back to the growth and development of our faculty, staff, and students to make a greater impact on our world.

Wishing you all the best for the remainder of 2024!



# Letter

**FROM THE PLANT PATHOLOGY GRADUATE  
STUDENT ASSOCIATION PRESIDENT, MAHNOOR ASIF**

The Plant Pathology Graduate Student Association (PPGSA) consists of Master's and Ph.D. students working within the plant pathology department. Our students are working on projects from all areas of plant pathology, encompassing a large breadth of plant pathogens and plant diseases. This year we focused on building connections with other graduate student associations (GSA) within the university and initiated a student retreat in spring 2024 to focus on student bonding and developing a professional network outside the department.

Something we proudly co-hosted with the help and guidance of our Plant & Pest Diagnostic extension educator, Kyle Broderick, was the Plant Pathology booth at the Farmers' Market and the East Campus Discovery Days. Students were able to interact with community members and answer their questions on what plant pathology is, how to protect their plants, and why the work we do in the department matters. The booth was a great opportunity for students to build their communication skills and learn about a wide variety of plant diseases. In line with outreach, PPGSA established connections with Lincoln Northeast High School and hosted the Plant Pathology booth and offered a hands-on learning experience at an afternoon club there. We strive to further deepen our involvement with local high schools to make the name of our department heard and awaken interest in plant pathology early on.

The 2023 Annual Elevator Speech Contest was an enormous success and was offered in a hybrid format. This event is a collaboration between the Plant Pathology, Agronomy & Horticulture, and Entomology departments, which gives students the opportunity to practice communicating their research in three minutes. Multiple students from PPGSA participated and earned 2<sup>nd</sup> and 5<sup>th</sup> place! Two of our students, Chris Termunde and Pratibha Karki, played major roles in organizing this event.

PPGSA has also been very active internally by planning socials, faculty-student engagement lunches, and monthly general meetings. Students have participated in board game nights, an ice cream social, Halloween pumpkin painting, Friendsgiving, a holiday cookie-baking social, and a trip to the Omaha Zoo! For our faculty-student engagement lunches, Plant Pathology faculty or other university members are invited to discuss topics that enhance students' professional development. This year we tried to incorporate speakers that talked about a wide variety of topics, one being time management. These sessions allow our students to expand their professional network and skills, learn about research being conducted at other universities, and identify future opportunities and collaborators.

All of these activities and opportunities would not be possible without the substantial effort from the 2023-2024 officer team: Chris Termunde (Vice-President), Xin Zhi Khoo and Sarah Adam (Social Coordinator), Eric Parperides (Treasurer), Pratibha Karki (Secretary), and Chikoti Mukuma (GSA representative). Many thanks to them for their commitment to making PPGSA great!

# PPGSA IN ACTION

## 2023-24 OFFICERS

**President:** Mahnoor Asif  
**Vice President:** Chris Termunde  
**Treasurer:** Eric Parperides  
**Secretary:** Pratibha Karki  
**GSA Representative:** Chikoti Mukuma  
**Social Coordinator:** Sarah Adam/Xin Zhi Khoo



**ABOVE:** 2023-24 PPGSA Officers (left to right): Chikoti Mukuma, Pratibha Karki, Sarah Adam, Chris Termunde, Mahnoor Asif, and Eric Parperides

## OUTREACH



**ABOVE:** Pratibha Karki, Mahnoor Asif, and Dr. Dylan Mangel teaching Lincoln Northeast High School students about Plant Pathology

## ENGAGEMENT



**ABOVE:** Students met with Craig Langemeier ('12 alumnus) for an engagement lunch in March 2023

## SOCIAL



**ABOVE:** Loren and Keryl Giesler hosted students for a springtime backyard barbecue. **RIGHT:** Meeting up for ice cream at the UNL Dairy Store.



# COMPLEX BIOSYSTEMS

By: Dr. Jennifer Clarke, Stacey Herceg, and Michael Richter

The Complex Biosystems program is directed toward students interested in answering research questions in the life sciences using quantitative approaches to data acquisition and analysis. In this interdisciplinary program, graduate students participate in a full year of research rotations (three total) on diverse topics, with one semester of laboratory teaching experience. In the first year of study, students consider “big questions” in the life sciences and learn current technical and analytical approaches to address them. In addition to scientific communication skills and ethical research conduct, students acquire a foundation in life sciences, statistics, bioinformatics, and computational analysis. The program aims to produce highly competent professionals with the strong communication, collaboration, and team building skills needed for success in a scientific career.

### Areas of Focus

Students can specialize in areas such as computational biology, organismal biology, ecology and evolution, integrated plant biology, plant pathology, bio-medical science, microbial interactions, and systems analysis. The diverse focus areas allow students to align their research with their specific interests and career goals.



### RESEARCH OPPORTUNITIES



### Interdisciplinary Research

The program offers extensive opportunities for interdisciplinary research, enabling students to collaborate with experts across various scientific disciplines. This approach opens doors to innovative and holistic approaches to solving complex biological problems.

### Cutting-Edge Facilities

The program provides access to state-of-the-art research facilities, advanced equipment, and technology, fostering an environment conducive to groundbreaking research. Students can leverage these facilities to explore complex biosystems using advanced methodologies.



### Industry Partnerships

Students have the opportunity to engage in collaborative research projects with industry partners, allowing them to apply their knowledge to real-world challenges. These partnerships provide valuable exposure to industry practices and potential career pathways.



### FACULTY AND COLLABORATIONS

### Esteemed Faculty

The program boasts a distinguished faculty comprising leading experts in the field of complex biosystems. Faculty members bring diverse research expertise, mentorship, and academic guidance, offering students valuable insights and support throughout their doctoral journey. We currently have 106 participating faculty members in our interdisciplinary program.

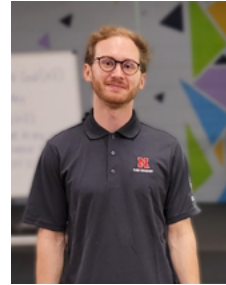
### Research Collaborations

The program encourages and facilitates collaborations with renowned research institutions, both nationally and internationally. These collaborations provide students with exposure to varied research methodologies and perspectives, enriching their academic experience and network.

### Interdisciplinary Engagement

The program fosters an interdisciplinary research environment, where students can engage with faculty and researchers from diverse disciplines. This cross-pollination of ideas and expertise enriches the learning experience and opens avenues for innovative research collaborations.

### CBIO PLANT PATHOLOGY STUDENT HIGHLIGHTS



**Current Student**  
Michael Richter (Ph.D.) student has been working under Dr. Richard Wilson on the rice blast fungus, *Magnaporthe oryzae*.

### Program Alumna

Dr. Katherine LaTourrette graduated in May 2023 and is now a Scientist I, Computational Biology (Flagship Pioneering)



To learn more about the CBIO Ph.D. Program please go to <https://cbio.unl.edu/>  
**Program Contacts**

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Program Co-Director

**Stacey Herceg**  
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Program Coordinator

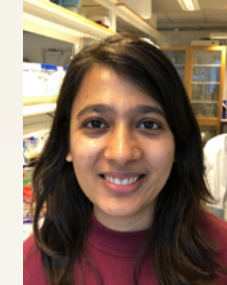
# FRESH FACES



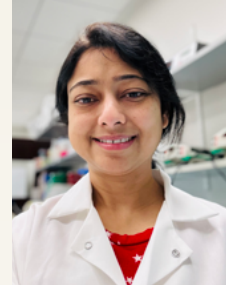
**Faith Camargo**  
Office Associate



**Conner Chu**  
Technologist



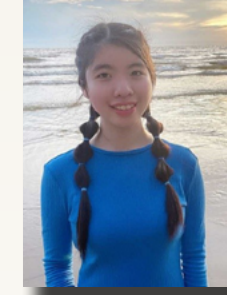
**Shilu Dahal**  
Ph.D. Student



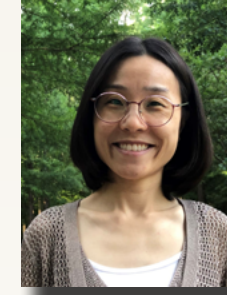
**Dr. Soumita Das**  
Post-Doc



**Sapana Ghimire**  
Ph.D. Student



**Xin Zhi Khoo**  
M.S. Student



**Dr. Saet-Byul Kim**  
Assistant Professor



**Dr. Thiago Maia**  
Post-Doc



**John McKendry**  
Project Coordinator



**Biwesh Ojha**  
Technologist



**Dr. Clemencia Rojas**  
Associate Professor



**Nisha Rokaya**  
Ph.D. Student



**Dr. Sudeep Tiwari**  
Post-Doc



**Daniella Norah Tumusiime**  
Technologist



**Sangsik Yun**  
Lab Manager

**Welcome to all new members of our department! We're happy you're here.**

# FINDING OUR STRIDE IN INCLUSIVE EXCELLENCE

The Inclusive Excellence Advisory Group remained active in efforts to advance diversity, equity, inclusion, and belonging (DEIB) in the department during our second year since inception. We continued to meet monthly, share resources on our webpage, and communicate regularly with the wider community through the department's weekly newsletter. We primarily focused our efforts on sustaining three projects that were implemented in previous years: new student orientation, internal awards, and DEIB learning events.

In the spring and fall of 2023, we hosted our department's second and third orientation for new graduate students. Our new members were welcomed by their advisor, graduate committee chair, graduate coordinator, department head, administrative associate, and president and vice president of the Plant Pathology Graduate Student Association (PPGSA). All these positions play a key role in the success of our students and their presence provided an immediate network of support for the newcomers.

Building a community of support and belonging is a primary goal for the Advisory Group. One of the ways we do this is by recognizing the positive impact our department members have through the distribution of awards. In 2023, we were thrilled to see the number of nominations grow for our semi-annual Green Thumb award, which was presented to the following members:

- Donn Ladd, Greenhouse Manager and IT Support
- Kathy LaTourrette, Ph.D. student
- Mahnoor Asif, Ph.D. student
- Peter Mullin, Researcher and Lecturer
- Amber Hadenfeldt, Administrative Associate
- Chikoti Mukuma, Ph.D. student
- Jennifer Frasier-Davison, Administrative Assistant, Microbiology Program
- Josh Giesler, undergraduate student worker
- Talon Mues, M.S. student and technologist
- Becky Higgins, technologist
- Sarah Adam, technologist

The department's first-ever annual Service Award was presented to Administrative Associate Amber Hadenfeldt in March 2023. Amber was picked from a pool of nominations for going above and beyond the requirements of her position to have a big impact on our community. The Advisory Group looks forward to presenting the second annual Service Award to a well-deserving faculty member, staff member, or student during the third annual International Food Night in February 2024. This highly attended event, hosted by our graduate students, has quickly become our favorite way to celebrate



**INTERNATIONAL FOOD NIGHT 2023**  
Grad students celebrated International Food Night by dressing in clothing significant to their culture

the diverse cultures in our department. Attendees are encouraged to dress in traditional clothing, share food that is significant to their community, or give a brief presentation on an aspect of their cultural background.

In April, a small group of faculty, staff, and students attended the Define American Banquet with financial support from the department. This annual event is an important fundraiser for providing scholarships to undocumented and Deferred Action for Childhood Arrivals (DACA) students at UNL who, because of their status, are not eligible for financial aid. We learned about this area of need through an evening of heartfelt and informative speeches.

To keep our department continually learning in the DEIB space, the Advisory Group organized two presentations. On April 17, Pat Tetreault, Director of UNL's Gender and Sexuality Center, helped us grow in our knowledge of pronouns and transgender identities to make our language more inclusive. In October, advocates from UNL's Big Red Resilience & Well-being Center led a discussion on self-care by introducing us to methods and practices we can incorporate into our everyday lives for a happy and healthy lifestyle.

In the summer, the Advisory Group hosted a new type of social event aimed at engaging department members in informal dialogues about their cultural backgrounds and experiences. We piloted the first Culture Talk to a packed room and enjoyed sharing stories and memories on the topic of music. In the fall, we hosted a second Culture Talk with the theme of games and hobbies. We plan to carry on this tradition once a semester.

We deployed a department-wide climate survey this fall, with the assistance of Associate Vice Chancellor Rich Bischoff, to gauge how much our department had grown in the DEIB space over the past two years. The climate survey results will be foundational to the Advisory Group's work in 2024 as we develop recommendations to address areas of need.

At the end of 2023, Ph.D. students Mahnoor Asif and Nawaraj Dulal, technologist Becky Higgins, and Courtesy Faculty Dr. Jeewan Jyot with NUtech Ventures completed their terms on the Advisory Group. We thank them for their hard work and dedication to advancing DEIB in the department. Dr. Stephen Wegulo and Amber Hadenfeldt will serve a second term in 2024. Graduate students Shilu Dahal and David Sirengo, technologist Tim Harris, Extension Educator Amy Timmerman, and Post-Doc Thiago Maia will join them. We look forward to further serving the department and encourage our colleagues to continue nominating each other for department awards, share DEIB resources, advocate for one another, and cultivate supportive relationships as we stride into 2024.

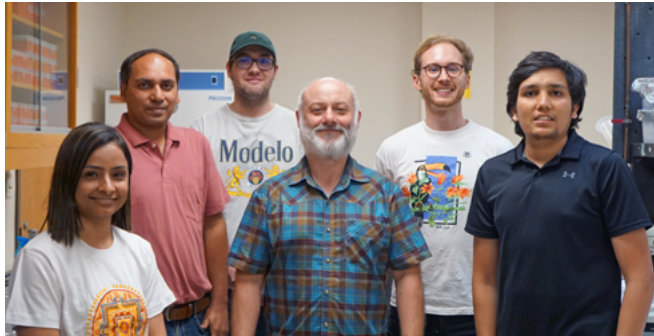
## **DATING/DOMESTIC VIOLENCE AWARENESS DAY**

Faculty, staff, and students wore purple shirts and ribbons on Oct. 19 to raise awareness and support those affected by dating/domestic violence on campus



2023 was an exciting year! Read on to learn about what was happening in our labs over the last 12 months.

## WILSON LAB



Left to right: Nisha Rokaya (Ph.D. student), Sudeep Tiwari (post-doc), Josh Giesler (UCARE student), Dr. Rich Wilson (PI), Michael Richter (Ph.D. student), Nawaraj Dulal (Ph.D. student)

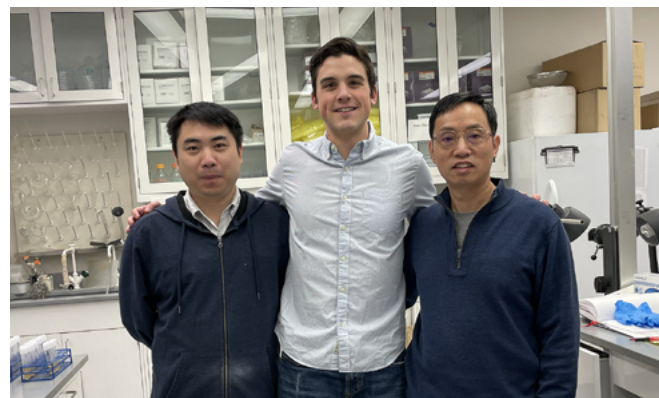
outlets and blogs, including on NSF's own website, due to the novelty of its findings. It currently has an altimetric score of 105, placing it in the 97th percentile of the 340,925 tracked articles of a similar age in all journals for online attention. Graduate students Michael Richter and Nawaraj Dulal both spoke about our *M. oryzae* research at the regional NCCC207 meeting and presented posters at the international APS meeting.

At UNL, Dr. Wilson was nominated for a second term to the ARD Advisory Council.

Dr. Gang Li left the lab to pursue new directions in wheat research. Three new members joined the lab, UCARE student Josh Giesler working on plastic degradation by mushrooms, and Dr. Sudeep Tiwari and Nisha Rokaya, who are both working on our "concrete" projects. Here, in collaboration with Dr. Grace Jin, we are constructing synthetic lichens that repair concrete cracks and create building materials from Mars regolith in anticipation of Mars colonization. This work has brought in federal funding worth \$3.5 million from USDA-NIFA, DARPA, and NASA.

Our core research remains investigating the biology of the rice blast fungus *Magnaporthe oryzae*. We published two big papers on this work in 2023 in *Nature Microbiology* and *Nature Communications*. The *Nature Microbiology* paper was highlighted in 9 news

## ZENG LAB



Left to right: Dr. Chaofeng Wang (post-doc), Mitch Hockbein (M.S. student), Dr. Lirong Zeng (PI).

In 2023, our research focused on elucidating the molecular mechanisms underlying the modulation of plant immunity through the regulation of the stability of a key plant cell surface immune receptor, FLS2. Our findings revealed that a plant RING-type

E3 ubiquitin ligase governs plant defense against bacterial infections by targeting two subunits of the endosomal sorting complex required for transport (ESCRT)-I complex, which in turn negatively regulate the stability of FLS2. The ESCRT machinery, renowned for its high conservation across diverse organisms, plays pivotal roles in various cellular pathways. Our discovery that ubiquitination, a form of posttranslational protein modification, influences the function of the ESCRT complex and enhances our comprehension of cellular processes extending beyond plant immune signaling. Furthermore, through collaboration with an external research group, we uncovered the involvement of a soybean E3 ubiquitin ligase in plant immunity. This year, we celebrated the graduation of our graduate student, Mitchell Hockbein, in May. Mitchell successfully defended his thesis, earned his master's degree from UNL, and transitioned to a new role at Corteva Agriscience. We were also delighted to share in the joy of our postdoctoral associate, Chaofeng Wang, who welcomed a lovely baby girl to his family.

## SIGMON LAB

Research in the Sigmon lab focuses on a variety of different projects involving molecular biology, genetics, development and/or phenotyping in both maize and sorghum, and to provide research opportunities for undergraduate students. During the summer of 2023, master's student Kyle Linders completed and successfully defended his thesis titled, "Plasticity of Sorghum Biomass and Inflorescence Traits in Response to Nitrogen Application." Kyle is currently employed as a research technician in Dr. James Schnable's lab at UNL.

Microbiology undergraduate student Alice Guo completed her honors thesis project and graduated in May 2023. She is currently a student at the UNMC School of Dentistry. Claire Snodgrass, also an undergraduate Microbiology student, began working on a project focusing on characterizing a CRISPR-Cas9 edit of a gibberellin 2-oxidase gene in sorghum. She presented a poster of her preliminary results at the 2023 Nebraska Plant Science Symposium and won the best undergraduate poster presenter award. Kevin Dockery joined the group in May 2023 to also work on the CRISPR-Cas9 project. He plans to complete an honors thesis and is currently planning to pursue graduate studies after he graduates in May 2024. The lab also was fortunate to host a talented high school intern, Jennifer Lee, during the summer of 2023. Jennifer helped Kevin characterize and genotype CRISPR-Cas9 sorghum edited lines and started as a Biochemistry and Biological Sciences double major at UNL in the fall of 2023.



Jennifer Lee (left) and Kevin Dockery (right) with a CRISPR-Cas9 edited sorghum plant we named "Letitia." To our surprise, Letitia, although much delayed, would go on to produce seed. We look forward to seeing what the next generation brings!

## WEGULO LAB



Fusarium head blight (FHB)

The Wegulo Lab studies the epidemiology and integrated management of Fusarium head blight (FHB), a devastating disease of wheat and other small grain cereals caused mainly by *Fusarium graminearum*. The lab has previously also participated in research on the wheat streak mosaic disease

complex. Wheat and barley lines in the UNL small grains breeding program are screened for resistance to FHB, stem rust, and leaf rust. Field trials are conducted to evaluate the efficacy of fungicides in controlling head and foliar fungal diseases of wheat including FHB, leaf spots, and rusts. Extension activities include the development and delivery of clientele-targeted educational materials, participation in crop production clinics and field days, and annual wheat disease surveys. The lab is managed by research technologist Julie Stevens and is assisted by several student workers each year. In early May, Dr. Wegulo visited Dr. Fatiha Bentata at INRA-Morocco (National Institute for Agricultural Research) in Rabat as a follow-up visit resulting from a USDA-FAS Scientific Exchange Fellowship Program (FY19) in which Fatiha participated at UNL in 2022. During the visit, he presented a seminar, visited INRA's agricultural research facilities, and gained a broad range of knowledge on agriculture in Morocco. In August, Dr. Wegulo and Mahnoor Asif, a Ph.D. student in the Wegulo Lab, attended the annual American Phytopathological Society (APS) meeting in Denver, CO, where Mahnoor presented a poster highlighting her research on the effects of fungicides and cultivars on foliar fungal diseases of wheat. In August, Dr. Wegulo delivered an invited talk at the 12<sup>th</sup> International Congress of Plant Pathology (ICPP) in Lyon, France. The talk focused on synergism between viruses in the wheat streak mosaic disease complex in wheat. In December, Dr. Wegulo attended the annual National Fusarium Head Blight Forum in Cincinnati, OH, where he served as a judge in a Flash and Dash poster competition for post-docs.

## POWERS LAB



Dr. Tom Powers (left) with graduate students Shilu Dahal (center) and Sapana Ghimire (right) at the debut gallery show for *Unseen and Underfoot*

When I was young I wanted to be an explorer. Growing up in the outskirts of Washington DC in the 1960's, exploration was always in the news. In 1962, our entire elementary school watched as John Glenn orbited the earth. My grandfather took me to the National Geographic Society to hear Louis Leakey speak about the discovery of ancient human fossils in Olduvai Gorge, and

Rachel Carson's *Silent Spring* encouraged a focus on our interconnections with nature. My version of exploration in the Maryland countryside consisted of collecting snakes, turtles, and butterflies. The prized specimen, as I recall, was the Luna moth and I'm sure we had no idea that our intensive collections played a role in depleting local Luna moth populations. I went to Purdue University because it offered an undergraduate major in Entomology and a large number of Entomology courses. One of the last courses I took was a Nematology course from Dr. Virginia Ferris. She had just published an article in *Science* about plate tectonics and the global distribution of nematodes. Also during that last semester, I met an athletic research technician in Entomology who enjoyed running and tennis as much as I did. Before the end of the semester, Kris had agreed to get married, and we headed off to the University of Florida where I enrolled in the Entomology and Nematology Department. I was overwhelmed with my \$4,000 per year assistantship, and Kris quickly got a job with EPA to conduct pesticide analysis in commercial food crops. For my M.S. degree, I worked under the direction of Dr. A.C. Tarjan, a retired, but still active nematode taxonomist. After a long career, Dr. Tarjan had decided to investigate marine nematodes, and managed to get me a spot on a research voyage to the Dry Tortugas. This was my first opportunity to live the life of an explorer! There were flying fish, sea turtles, and sharks, all of which I viewed from the deck where I spent most of my time violently sea-sick. Subsequent adventures were mostly confined to the lab where I comfortably studied the ultrastructure of nematode cuticle. Kris and I next traveled to Riverside, California, where Dr. Jim Baldwin, the new taxonomist at UCR, offered me a Ph.D. assistantship examining stunt nematodes in the subfamily Merliniinae. Kris got a research technician position with Dr. Ed Platzer who was working with the nematode

referred to as "Skeeter Doom" a mermithid nematode that parasitizes larval mosquitoes, killing the mosquito before it reaches the adult stage. Eventually we worked together on that nematode, and determined that the mitochondrial genome was the largest known for a multicellular animal. That was the beginning of a new chapter in the exploration of nematode mitochondrial genomes.

## GARCIA-RUIZ LAB



Left to right: Dr. Hernan Garcia-Ruiz (PI), Amany Gomaa (Ph.D. student), Eric Parperides (Ph.D. student), and Dr. Katherine LaTourrette (Ph.D. graduate)

Gene silencing is a critical determinant of plant-microbe interactions. Research in our lab is focused on the basic mechanisms of plant-virus interactions, specifically antiviral gene silencing, induction and suppression of gene silencing by plant pathogens, and viral genomics. Current projects focus on the early steps leading to gene silencing initiation; identification and characterization of susceptibility genes to plant viruses, and cellular siRNAs as determinants of defense responses. We implement an interdisciplinary approach that combines biochemical, genetic, genomic, and bioinformatic tools. We use experimental model systems that consist of positive- and negative-strand RNA viruses and model plants *Arabidopsis thaliana* and



*Nicotiana benthamiana*, and heterologous host *Saccharomyces cerevisiae*.

We are particularly interested in the mechanisms of Maize Lethal Necrosis disease and genomic variation in viruses. We have identified hypervariable regions in the genome of potyviruses, poleroviruses, orthospoviruses, and betacoronaviruses. Hypervariable areas in viral genomes mediate adaptation to hosts and vectors without compromising functionality. The computational approach developed is a fundamental tool for profiling viruses of agricultural importance. Our findings have an immense impact on agriculture, such as molecular diagnostics and engineering of genetic resistance to viral diseases in plants. Our lab is housed at the Morrison Life Science Research Center and is part of the Nebraska Center for Virology. For more information visit: <https://plantvirology.unl.edu/>.

## ROJAS LAB



Back row, left to right: Biwesh Ojha (technician), Dr. Thiago Maia (post-doc), John McKendry (project coordinator), Conner Chu (research technician). Front row, left to right: Kiyara Grosz (undergraduate student), Shilu Dahal (Ph.D. student), Dr. Clemencia Rojas (PI), Dr. Soumita Das (post-doc), Sapana Ghimire (Ph.D. student)

The Rojas Lab started on January 1, 2023 with Ph.D. student Shilu Dahal, technician Conner Chu, project coordinator John McKendry and undergraduate student, Kiyara Grosz. We were later joined by postdoctoral researchers Thiago Maia and Soumita Das, graduate student Sapana Ghimire, and technician Biwesh Ojha. We also hosted undergraduate students, Nicolas Pardo, Mariam Al-Balushi, and James Houlahan. Everyone was incredibly helpful setting up the lab and very efficient starting their own research. The lab also hosted Dr. Brahima Camara from Côte d'Ivoire, who came as a USDA-FAS fellow. He worked with Shilu Dahal and Kiyara Grosz evaluating the antimicrobial activity of essential oils against the bacterial pathogen *Burkholderia glumae*.

We were very productive showcasing our research at UNL as well as national and international conferences. Shilu Dahal presented her research on the antibacterial properties of the environmental bacterium *Pseudomonas protegens*, at the departmental seminar and at the APS-North Central Division meeting. She also presented her research on the impact of high night temperatures on Bacterial Panicle Blight of rice at the APS annual meeting. Thiago Maia and Conner Chu presented their research on plant immunity and the impact of bacterial type III secreted effectors, respectively, at the IS-MPMI conference and at the Plant Science Symposium and the Microbiology Symposium at UNL.

The lab also had a publication in *Frontiers in Microbiology* showing how the *Pseudomonas syringae* type III effector HopD1 interferes with the cellular dynamics of the plant immune protein AtNHR2B.

We were also productive establishing collaborations with other researchers at UNL, which will translate into publications in 2024.

## MITRA LAB

Mitra lab research is focused on developing disease resistant transgenic and gene-edited potato, tomato and pea plants. Their efforts include use of multi-domain antimicrobial peptides, R gene remodeling, and RNA interference approaches for resistance against



Dr. Iskender Tiryaki, newest visiting scientist in the Mitra lab and UNL alumnus.

zebra chip disease in potato, several viral and bacterial diseases of tomato, and nutritional improvements in pea. Graduate student Serkan is trying very hard to make up lost time and graduate by summer 2024. A new visiting scientist Dr. Iskender Tiryaki joined the lab during the summer and Dr. Soylu is eagerly waiting to welcome their first child early next year. *Editors note: We're excited to announce that Dr. Soylu and his wife welcomed a healthy baby girl in April 2024.*

## VAN ETTEN LAB

The Van Etten laboratory continues to work on a range of topics associated with the molecular biology, biochemistry, physiology, ecology, genetics, and bioinformatics of viruses that infect certain unicellular, eukaryotic chlorella-like green algae. Chloroviruses are found in freshwater all over the world and they have many interesting and unexpected properties. One property is that the chloroviruses are among the largest viruses known, containing as

many as 16 tRNA-encoding genes and 450 protein-encoding genes, including many not previously reported in viruses. These genes encode DNA restriction and modification enzymes, hyaluronan and chitin biosynthetic enzymes, polyamine biosynthetic enzymes, ion channels and transporters, and many glycosyltransferases. The proteins encoded by some of the chloroviruses are either the smallest or among the smallest proteins of their class. Consequently, some of the chlorovirus-encoded proteins are the subject of intensive biochemical and structural investigation.



Left to right: Dr. Jayadri Ghosh (post-doc), Dr. Maitham Al-Sammak (technician), Dr. Zeina Al-Ameeli (technician), Eric Noel (Ph.D. student), Dr. Irina Agarkova (Research Asst. Prof), Dr. Jim Van Etten (PI), Fatima Al-Sammak (volunteer), Dr. Dave Dunigan (Research Prof.)

Currently there are over 500 publications on the chloroviruses and their gene products. In the past year, our lab published seven manuscripts on the viruses. This year's publications were in the *Proc. Natl. Acad. Sci.*, *J. Virology*, *Viruses* (2), *Traffic*, *Microbial Ecol.*, and *Appl. Environ. Microbiol.* I also gave invited talks at three meetings: the 11<sup>th</sup> Aquatic Virus Workshop, Quebec City, Canada; the Ion Channel Design Using Experimental and Computational Inputs meeting in Darmstadt, Germany; and the 5<sup>th</sup> Giant Virus Meeting, Ringberg Castle,

Germany. I also gave an invited talk at New England Biolabs. Our recent work on the ecology of the chloroviruses with John DeLong (School of Biological Sciences at UNL) led to the exciting finding that the chloroviruses can serve as a food source for certain protists. This means that viruses need to be considered as part of the food chain. The first paper describing this significant finding was published in the 2023 *Proc. Natl. Acad. Sci.* We currently have a NSF-EPSCoR-funded project with the University of Delaware, University of Hawaii, and Roger Williams University (Rhode Island) that involves looking for chloroviruses in the unique alkaline lakes located in western Nebraska. There are only two other places in the world that have lakes similar to the ones in Nebraska. We also have funding from the Stuart Nichols ALS Research Foundation because there is a chance that some chloroviruses may be associated with ALS diseases.

## GARCIA-AROCA LAB

Spring is a time of growth and renewal, and here at the Fungal Ecology Lab in the Department of Plant Pathology at UNL, we're bustling with activity as we delve deeper into understanding the intricate world of fungal plant pathogens. Our mission? To uncover the secrets driving evolution and diversity in fungal populations, not just in Nebraska, but across vast ecosystems globally. So, what's our big question? We're on a quest to unravel the mystery of what limits the distribution of these sneaky pathogens in both agricultural and non-agricultural settings. By peeling back the layers of

variation in pathogen populations, exploring their evolutionary history, and pinpointing the factors constraining their spread, we're paving the way for groundbreaking discoveries that could revolutionize long-term management strategies.

At the heart of our approach lies a commitment to bridging the gap between applied and fundamental research in fungal ecology. In other words, we're not just scratching the surface; we're diving deep into the core of fungal pathogen biology and ecology to lay the groundwork for innovative solutions in the ongoing battle against plant diseases.

Let's talk about our fantastic team:

First up, Xin Zhi Khoo, who's hard at work pursuing her M.S. degree, unraveling the evolutionary patterns of host preference in *Rhizoctonia solani*.



Left to right: Tessa Fiore (undergrad), Daniella Norah Tumusiime (lab manager/technician), Ellie Greisen (undergrad), Xin Zhi Khoo (M.S. graduate student), and Teddy Garcia-Aroca (PI)

Next, meet Daniella Norah Tumusiime, our lab manager/technician extraordinaire, who's been with us since August 2023, driving forward several research projects and playing a pivotal role in establishing and advancing our lab's mission.

Joining us in the pursuit of knowledge is Tessa Fiore, a junior in Environmental and Sustainability Studies. Tessa's focus?

Unearthing historical and current fungicide resistance in *Sclerotinia sclerotiorum* on soybean, shedding light on crucial insights for sustainable agriculture.

Fresh to our team is Ellie Greisen, a sophomore in Agronomy, brimming with curiosity about fungal plant pathogens. Ellie is currently teaming up with Norah on a project aimed at surveying and developing alternative management strategies for soil-borne and seedling pathogens of soybean. And me, Teddy Garcia-Aroca, who has been diligently steering the ship as best I can, writing grant proposals, forging collaborations, refining teaching strategies, and pushing forward with manuscripts from previous work.

As the flowers bloom and the world awakens to the vibrant energy of spring, we're emboldened in our pursuit of knowledge, driven by a shared passion for understanding the intricate dance between fungi and their plant hosts. Stay tuned for more exciting updates from the Fungal Ecology Lab as we continue our journey of discovery!

## HARVESON LAB



Dr. Bob Harveson in his home library

Dr. Bob Harveson is an Extension Plant Pathologist at the Panhandle Research and Extension Center in Scottsbluff, NE.

His current appointment involves 50% research and 50% extension, with statewide programming responsibility for specialty crop diseases. His research program focuses on the etiology and applied management of root rot diseases of sugar beets, bacterial diseases of dry beans, and sunflower diseases utilizing the integration of biological, cultural, chemical, and predictive methods. He has conducted additional projects involving several new pulse crops (chickpeas, cowpeas, and dry yellow peas) as well as potatoes, corn, chicory, and wheat.

The plant pathology program has employed field disease surveys and disease diagnostics as cornerstones to establish an extension and research program. The diagnostic lab at Scottsbluff has processed more than 28,000 total (plant and soil) samples since the fall of 1999. This service has created new publications, generated partial income for technical support, and identified and highlighted important problems, while also providing preliminary data for new proposals that attempt to address these issues with applied research. This service has additionally resulted in more than 25 reports on the occurrence of new diseases.

In collaboration with USDA plant pathologist, Lyndon Porter, we published an article in *Plant Health Progress*, that described the identification of Alfalfa mosaic virus for the first time in North America from cowpeas (black-eyed peas).

I am an active member of a sunflower work group funded by USDA's North Central IPM program. One of our major activities in 2023 was to translate two plant disease lessons (Phomopsis stem canker and White Mold of sunflower) into Spanish and publish in the APS journal *Plant Health Instructor*. Another activity was the production of a new set of diagnostic cards focused on sunflower nutritional disorders. Sixteen distinct disorders were included.

# JACKSON-ZIEMS LAB



Left to right: Brad Tharnish (technologist), Talon Mues (technologist and M.S. student), Asha Mane (Ph.D. student), Dr. Tamra Jackson-Ziems, Chikoti Mukuma (Ph.D. student), and Chris Termunde (M.S. student)

2023 was a busy year for our team! We're pleased to announce that Dr. Asha Mane, co-advised with Dr. Sydney Everhart, graduated with her Ph.D. in December. Her dissertation is titled, "Complementary Approaches to Fungicide Resistance Management in Nebraska: Development of a DNA-Based In-Field Assay for Detection for QoI Resistance in Soybean Pathogen *Cercospora sojina* and a Stakeholder Survey to Assess Foliar Fungicide Use for Soybean Disease Management." Congratulations, Dr. Mane! Brad Tharnish (and wife Melissa) welcomed their daughter Veronica Ruth in August. Brad recently took on the role of Lab Manager for our team and continues to oversee our annual field trials and other lab activities. Technician and M.S. student Talon Mues spent a lot of time during the 2023 growing season chasing tar spot across Nebraska to support our efforts updating the distribution map at <https://corn.ipmpipe.org/tarspot/>. His efforts documented spread of the pathogen to at least 47 counties. His thesis

research focuses on the impact of irrigation on the canopy microclimate conditions and tar spot development.

Chris Termunde and Chikoti Mukuma continue their work on research to learn more about crown rot disease of corn, an emerging disease in the Corn Belt catching the attention of growers and industry. Chikoti is leading the species identification of pathogens recovered from samples (and their interactions) received from Bayer Crop Sciences from nine states.

In addition to pathogenicity testing of the recovered isolates, Chris is also performing additional greenhouse work with soil from fields affected by the disease.

Tamra continues on a busy extension program schedule that is focused on bringing awareness and management solutions to stakeholders and experiential learning opportunities to students.

Members of the team participated in or presented at numerous events this past year, including the Corn Disease Working Group (Orlando, FL), North Central APS (West Lafayette, IN), Plant Parasitic Nematode ID course (Clemson University), Plant Diseases Across Nebraska course, as well as several outreach events for Nebraska Extension and industry at UNL South Central Ag Lab Field Day, Gothenburg, NE, and more.

# MANGEL LAB

The Applied Soybean Pathology Lab has experienced a year of robust research and community engagement. Our technician, Becky Higgins, has made notable advances on Phytophthora research, and Pratibha Karki, our dedicated graduate student, is pioneering research on soybean cyst nematode control that is poised to enhance yield resilience for Nebraska's farmers.

The summer was invigorated by the presence of three exceptional interns: Alex Roush, Ben Wheeler, and Cooper Hicks. Their industrious contribution to our field trials was marked by a memorable incident that saw two of them, and our lab truck, temporarily bested by Nebraska's challenging terrains. Their work ethic and spirit, however, remained unshakable.

Our research extended beyond the lab with trials conducted statewide, fostering a closer relationship with the growers we serve. Data from these trials were showcased at numerous field days, allowing us to directly relay findings and recommendations to growers. Furthermore, Pratibha presented her master's research at the Soybean Management Field Days, offering valuable insights into nematode management strategies.



Pratibha Karki (M.S. student) at front, presenting at a Soybean Management Field Days

As autumn leaves began to fall, so did the chapter close on Sarah Adam's time with our team. Her technical expertise supported many of our projects, and we recognize her contributions as a part of our lab's ongoing narrative of discovery and innovation. As we disseminate our findings, we not only share data but also the stories behind our research. Whether it's overcoming the elements in the field or navigating the intricacies of plant pathogens, every challenge faced has fortified our commitment to safeguarding soybean yields. In closing, our lab continues to strive for

excellence in plant pathology research. With every soybean field we step into and each dataset we analyze, we're reminded of our mission—to reduce yield losses and secure food production in Nebraska. Here's to furthering that mission in the coming year.

# KIM LAB

The Kim laboratory began in February 2023, focusing on understanding plant-microbe interactions in maize and sorghum through molecular biology, genetics, and cell biology.



Dr. Saet-Byul Kim

As spring began, two undergraduate students, Mike Willmann and Sam Spencer, initiated experiments to study non-host interactions in the lab, including fungal inoculation. We hired Sangsik Yun as a technician and conducted corn breeding experiments in the greenhouse. With the assistance of greenhouse manager Donn, we successfully harvested over 60 corn breeding lines, solidifying our confidence in breeding the desired corn varieties at UNL.

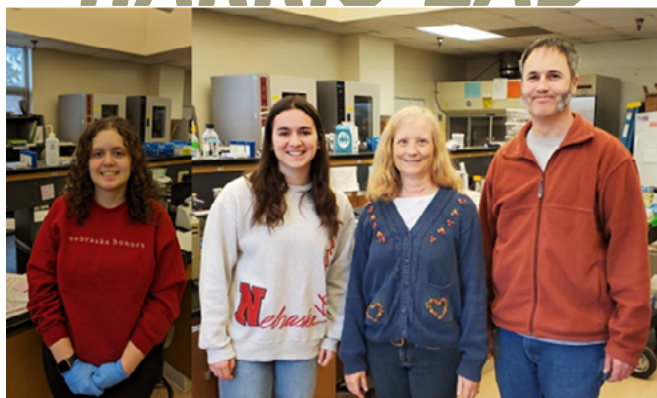


Left to right: Sam Spencer, Mike Willmann (undergrad students), and Sangsik Yun (technician)

Over the summer, we collected southern corn rust (*Puccinia polysora*), common rust (*Puccinia sorghi*), and sorghum rust (*Puccinia*

*purpurea*) spores from corn and sorghum belonging to Drs. Jinliang Yang and James Schnable in the Havelock field. These fungi are crucial research materials for the lab, and we were thrilled to have them. Sangsik's role as the lab manager allowed Dr. Kim to focus on her work, enabling participation in three conferences. Dr. Kim was even invited as a speaker at the IS-MPMI conference. Looking ahead to the spring of 2024, we are excited to work with an incoming post-doc and Ph.D. student in our lab. We will study how rust causes disease in corn and sorghum at the molecular level. Collaborating with Dr. Brandi Sigmon and Dr. James Schnable for the non-host interactions project adds to the excitement. Overall, despite the busyness of 2023, it was a year of significant accomplishments, and we will continue to achieve success in 2024.

## FUNNELL- HARRIS LAB



Left to right: Elli Petersen, Keeley Hourigan (undergrad students), Dr. Deanna Funnell-Harris (PI), and Pat O'Neill (technician)

The Funnell-Harris lab is focused on describing interactions of fungal pathogens with specific sorghum and wheat host

genotypes, especially those with altered lignin, starch, and pigment compositions and concentrations. Sorghum is a climate resilient crop that provides grain and forage but has the potential to contribute to emerging renewable product markets in the U.S. To compete in these markets, compositional improvements to both sorghum grain and forage are needed, as well as an understanding of how these changes affect interactions with fungal pathogens. Stalk rot pathogens are destructive and impact both grain and biomass yields. Many different fungi inhabit stalks without causing disease, but then various stresses such as drought trigger development of stalk diseases. Fusarium stalk rot and charcoal rot result in significant losses of sorghum biomass in the U.S. They can cause plant lodging and impair biomass and grain harvest and are particularly insidious when water is limited, especially around the time of flowering. We developed a method to simulate reduced water conditions in a greenhouse. Using this technique, we screen sorghum lines altered in lignin synthesis for resistance to pathogens and drought. Lignin is associated with disease resistance. Compounds related to lignin synthesis can have antifungal properties, so their accumulation may slow disease progression. Grain mold disease, which reduces sorghum grain quality, is caused by a complex of diverse fungal pathogens. We examine the role pigments that are deposited in the outer layers of the grain play in resistance to mold diseases. Tannins impart bird resistance due to their bitter taste, but these polyphenols are antinutritional. We are screening lines where tannins are present or absent in the grain to determine whether tannins can reduce grain molds. We are comparing the fungi inhabiting outer layers of the grain, where tannins and pigments are deposited, versus those in the starch-rich inner endosperm. We are also screening for damping off-resistant germplasm that

is particularly insidious when sorghum is planted under moist and cool conditions. Identifying lines resistant to seedling diseases under sub-optimal temperatures will allow for earlier planting to utilize spring soil moisture, further augmenting sorghum resiliency. Our M.S. student, Shiv Singla, graduated last Spring and is now in a Ph.D. program with Dr. Alyssa Koehler at University of Delaware. In his thesis, Shiv demonstrated that wheat lines overexpressing an enzyme in lignin production had increased resistance to Fusarium head blight, as compared to susceptible lines. He performed transcriptomics and metabolomics to identify potential genes or metabolic pathways with altered expression that may confer this increased resistance. Findings from Shiv's research can provide information for breeders to develop FHB-resistant wheat varieties in the future.

## TATINENI LAB



Left to right: Mritunjoy Barman (joint post-doc with Dr. S. Mondal), Jeff Alexander (biological science technician and lab manager), Satyanarayana Tatineni (PI), Chi Hzung (Jensen) Wong (Ph.D. student), Haritha Nunna (Ph.D. student), and Sourav Pal (Ph.D. student).

The main focus of Dr. Tatineni's lab research is virus-virus, virus-host, and virus-vector interactions of economically important *Wheat streak mosaic virus* (WSMV), *Triticum*

*mosaic virus* (TriMV), and High Plains disease (*Wheat mosaic virus* (WMoV)). Since these three viruses are transmitted by a common vector, wheat curl mite, mixed infection of wheat with two or three viruses is common in growers' fields with exacerbated yield loss. Dr. Tatineni's lab is working to understand how these viruses cause disease in wheat and identify the host and vector factors required for the completion of the virus infection cycle and use this information to disrupt the virus infection cycle through biotechnological approaches such as RNA interference and gene editing. To achieve these goals, Dr. Tatineni and his team are examining viral gene functions through reverse genetics and biochemical and molecular biology approaches and identifying host and viral factors through protein-protein and protein-RNA interaction and bioinformatics studies. The availability of GFP- or RFP-tagged WSMV and TriMV facilitated the examination of viral genes required for wheat curl mite transmission, movement, disease development, superinfection exclusion, synergistic interaction, and resistance mechanism of Wsm1 and Wsm2 genes in wheat cultivars against WSMV and TriMV. Dr. Tatineni's lab developed RNAi-based dual-resistant transgenic wheat against synergistically interacting WSMV and TriMV. Dr. Tatineni and his team are working on: (1) identifying viral determinants involved and mechanisms of synergistic interaction between WSMV and TriMV; (2) mechanisms of superinfection exclusion of WSMV; (3) virus-host interactions of WSMV to identify means of disruption and control of viral diseases; (4) mechanisms of wheat curl mite transmission of WSMV and virus-vector interactions between WSMV and wheat curl mites to identify ways to interrupt vector transmission; and (5) develop and characterize transgenic wheat for resistance to WSMV and TriMV and pyramid transgenes with natural resistance genes.

# UPDATES FROM THE PLANT & PEST DIAGNOSTIC CLINIC



P&PDC Coordinator,  
Kyle Broderick

2023 was another busy year in the Clinic as we received 1,055 unique samples from seven states. Of the 507 samples that were specifically submitted for “Disease ID”, 1,216 unique diagnoses were made. As is always the case, a large majority of the samples (80%) were corn, soybeans, or wheat. The P&PDC continued to serve as the pathologist for the Nebraska Department of Agriculture (NDA) and just under 1/5 (18%)

of the samples were a part of NDA greenhouse, nursery, and growing season field inspections. Fortunately, there were no major diseases identified that resulted in regulatory action. Aside from the agronomic and NDA samples, we also received samples from golf courses, vineyards, organic vegetable producers, and commercial greenhouses.

Once again, there was a problem early in the growing season due to the spread of bacterial blight of geranium, caused by the *Xanthomonas campestris* pv. *pelargonii*. This widespread disease was due to a large international wholesaler of geranium cuttings inadvertently shipping infected plant material. The P&PDC confirmed this disease in 3 different greenhouses in Nebraska and Iowa, resulting in thousands of cuttings being destroyed, but this potentially damaging disease didn't further spread to other greenhouses or resellers.

We continued to monitor the spread of tar spot of corn spread across the eastern portion of Nebraska. This disease is confirmed



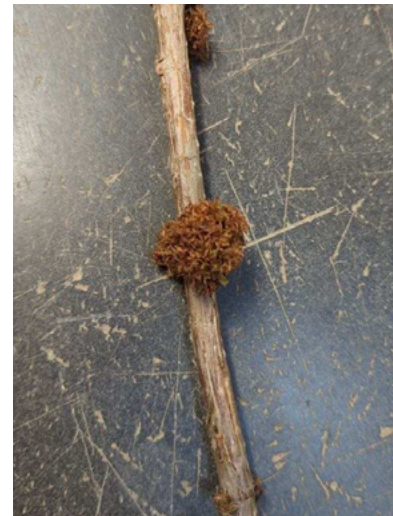
Rose rosette disease at Hamann Rose Garden. Note the red leaf color, excessive thorns, and distorted leaves.

in over 45 Nebraska counties, largely through a free testing survey that has been offered by the P&PDC for the last 2 years. In addition to common foliar diseases such as southern rust, bacterial leaf streak, and gray leaf spot, Fusarium crown and stalk rot was again problematic in many corn fields.

Attention to landscapes and gardening continued, with the P&PDC seeing a similar number of “non-Ag” samples as in the last couple of years. Abiotic problems, most of them drought related, were responsible for most of the plant problems.

An excitement in the P&PDC in 2023 was the discovery of phytoplasma affecting red dogwoods (above). Rose rosette disease, seemingly established in Nebraska now, caused many problems at the Hamann Rose Garden in Lincoln (left). As there is no cure for rose rosette disease, a large number of roses had to be destroyed, leaving the garden with a lot of empty space.

Our “Mobile Diagnostic Booth” at the Lincoln Haymarket Farmers' Market was very successful, making appearances at



Unknown phytoplasma of dogwood. Note witches broom symptoms on the nodes.

8 events throughout the season. With the help of the Plant Pathology Graduate Student Association, we were able to connect with many urban clients who were previously unaware of the P&PDC. We were also involved in the UNL Discovery Days, an educational event hosted on campus. While similar to the Farmers' Market outreach events, the Discovery Days had more of a youth focus. These outreach events are very popular with the public and provide a great opportunity for graduate students to learn more about the work of UNL Extension. A final highlight of 2023 was “hosting” a joint forest health workshop with the Great Plains Tree Pest Council and the Great Plains Diagnostic Network in Chadron, NE (a mere 7 hour drive away!). This workshop hosted 36 members of the U.S. Forest Service, GPDN members, and other tree health specialists. The primary purpose of this workshop was to gain a more comprehensive understanding of the problems facing both urban and rural forests across the Midwest.



Graduate student Chris Termunde shows the importance of back-lighting samples for disease diagnoses at the Haymarket Farmers' Market

## PROMOTION

### Kyle Broderick was promoted to Associate Extension Educator in 2023



- Kyle has been a long-term member of the Department of Plant Pathology and started his extension educator position in 2017.
- As the Plant & Pest Diagnostic Clinic Coordinator, Kyle serves Nebraska by providing diagnostic services and Plant Pathology training for Master Gardeners.
- Kyle leads and contributes to several outreach activities including hosting a booth at Lincoln Haymarket Farmers' Markets, teaching Master Gardener classes, and acting as a lead panelist on Backyard Farmer.
- Kyle is an active member of the National Plant Diagnostic Network (NPDN) and the Communications Committee and chaired the NPDN Outreach and Extension Committee 2020–23.
- Kyle's role in Extension is impacting the lives of Nebraskans by providing disease management recommendations in commercial production systems as well as landscapes within our communities.

# RETIREMENTS



Gary Yuen (center) teaching a tai chi movement observed by his wife Sharon (left) and son Marcus (right)

Dr. Gary Yuen devoted much of his first year of retirement to Taijiquan (aka tai chi), a classical Chinese martial art. He shared his passion for this art by providing community classes, health maintenance workshops, and classes offered through OLLI (Osher Lifelong Learning Institute) at UNL. Gary also dove (perhaps too deeply) into gardening, another of his passions. He accepted the role of co-VP of the Woodsshire Home Owners Association, essentially putting him in the hot seat for the management of the Woodsshire neighborhood's 4.5-acre park. Meanwhile, Gary kept involved in plant pathology by serving on graduate student committees, attending the APS Annual Meeting in Denver, and co-authoring two publications, one on bacterial biocontrol agents against early blight of tomato (<https://doi.org/10.1002/ps.7872>), the second on the switchgrass proteomic responses to rust infection (<https://www.mdpi.com/1422-0067/24/19/14630>).

# PLANT PATHOLOGY AWARDS

The Department of Plant Pathology offers annual department-specific awards.

The **Goss Memorial Scholarship** was developed to help defray expenses for students who are presenting research at regional and national/international meetings, attending and participating in relevant workshops, or any other appropriate scholarly activity beyond the normal execution of their research. In 2023, the Goss Award recipients were Nawaraj Dulal and Michael Richter.



The **PPGSA Professional Development Award** is used as financial assistance for travel to scientific meetings or to attend workshops and training events. In 2023, there were 10 recipients of the award: Mahnoor Asif, Shilu Dahal, Nawaraj Dulal, Amany Gomaa, Pratibha Karki, Xin Zhi Khoo, Talon Mues, Eric Parperides, Michael Richter, and David Sirengo.



The **Lambrecht Award for Technologists** recognizes the contributions of technologist Patricia Lambrecht to the science of plant pathology, the laboratory of Dr. Anne Vidaver and others, and assistance to the department in mentoring students, technicians, and post-docs in various techniques and practices in plant pathology, especially those connected with bacterial plant pathogens. The award is primarily for the furtherance of the awardee's education, attendance at conferences and meetings, travel to meetings and experimental sites, or other activities. In 2023, the recipient of the Lambrecht Award was Becky Higgins, technologist with Dr. Tom Powers.

Congratulations to all recipients of awards and scholarships in 2023!

# GRADUATES



**Mitch Hockbein**

M.S. graduate, May 2023  
Advisor: Dr. Lirong Zeng



**Katherine LaTourrette**

Ph.D. graduate, May 2023  
Advisor: Dr. Hernan Garcia-Ruiz



**Asha Mane**

Ph.D. graduate, December 2023  
Advisors: Dr. Tamra Jackson-Ziems and Dr. Sydney Everhart



**Shiv Singla**

M.S. graduate, May 2023  
Advisor: Dr. Deanna Funnell-Harris

- **Mitch Hockbein** moved to Des Moines, IA and started a new job as a Research Associate with Corteva Agriscience.
- **Katherine LaTourrette** moved to Cambridge, MA, and started a new job with Flagship Pioneering as a Scientist I in Computational Biology.
- **Asha Mane** has been enjoying spending time with friends and is currently preparing for her next move.
- **Shiv Singla** started his Ph.D. program at the University of Delaware in the lab of Dr. Alyssa Koehler.

**Congratulations to our 2023 Plant Pathology Graduates!**



The Department of Plant Pathology is on a trajectory to be a leading institution in our field of science. As we continue to grow our department, there is a consistent need to support faculty, staff, and students in ways that inspire community and strengthen relationships in order to build connections and a sense of belonging.

The Plant Pathology Department Excellence Fund has been established to provide opportunities for future students and our department community. It is critical that our students are exposed to a diverse set of experiences to help them become effective leaders. Teamwork, leadership, interpersonal skills, collaborative projects, community outreach, teaching, and communication with diverse audiences are examples of qualities we want our students to grow in by encouraging their participation in rewarding activities.

Please consider donating to this fund to ensure opportunities continue that build our community of professional plant pathologists at UNL. To make a contribution to this fund, please visit: [go.unl.edu/plantpath-excellence](http://go.unl.edu/plantpath-excellence).



DEPARTMENT OF PLANT PATHOLOGY