

SUMMER 2024

GENE NETWORK

The Agricultural and Medical
Biotechnology Alumni Newsletter



Martin-Gatton
College of Agriculture,
Food and Environment



A NOTE FROM OUR STEERING COMMITTEE CHAIR

In Fall 2023, our program updated the student advising scheme. With the help of Dr. Lou Hirsch, Ms. Esther Fleming, and our new academic advisor, Mr. Christopher Crutchfield, the transition went remarkably smoothly. We continue to enhance the integration of career and professional development advising, supported and conducted by our faculty members.

The Spring 2024 semester ended successfully, highlighted by the AMBT students' research experiences. Many students were nominated by their research mentors for the Agricultural and Medical Biotechnology Excellence in Research (AMBER) award and presented their work excellently at the UK Showcase of Undergraduate Scholars. Please see below for this year's recipients! Additionally, many students who took ABT 396 (the independent research credit course) also presented their work at the Showcase. We are proud of our students, as independent research experience is the heart of the AMBT program. Also, check out the Shout-Out section for more achievements from both AMBT students, alumni and faculty members.

Thank you so much for supporting the AMBT program. Please stay connected with us and share your success stories!

Tomo Kawashima

Associate Professor, Department of Plant & Soil Sciences
Steering Committee Chair, Agricultural & Medical Biotechnology Undergraduate Program

CONTENTS

2 | STEERING COMMITTEE CHAIR

WELCOME

4 | AGRICULTURAL AND MEDICAL BIOTECHNOLOGY EXCELLENCE IN RESEARCH AWARD RECIPIENTS

6 | ACCOMPLISHMENTS

The Glen B. Collins Undergraduate Research in
Agricultural Biotechnology Award

Xiomara Arias Participates in the International Plant and
Animal Genome Conference

Bothshelo Angoma Awarded the Prestigious Gaines
Fellowship

8 | AMBT SOLAR PARTY

9 | WHO'S WHO IN AMBT

AMBT Teachers Who Made a Difference

Undergraduate Shoutouts

Alumni Shoutouts

Faculty Shoutouts

11 | SPRING 2024 AMBT SENIOR SEND-OFF

AGRICULTURAL AND MEDICAL BIOTECHNOLOGY EXCELLENCE IN RESEARCH AWARD 2023-2024 RECIPIENTS

In 2021, the AMBT steering committee created a new student award, The Agricultural and Medical Biotechnology Excellence in Research Award, to recognize students who demonstrate outstanding undergraduate research. The AMBER award recipients must be nominated by their research mentor, contribute to research for two semesters, and give an oral presentation or present a poster at the Spring UK Showcase of Undergraduate Scholars. Since the creation of the award, sixteen students have been honored with this distinction. This year, six students were selected to receive The AMBER award.

Of the six recipients, **Warren Van Nort, Luke Meredith, Caroline Benda** and **Justin Wong** were graduating seniors. Warren Van Nort received his nomination from his research mentor, Tianyan Gao, Professor in the Department of Molecular and Cellular Biochemistry. Dr. Gao stated "I was impressed by his ability and willingness to learn from the very beginning. He worked closely with a graduate student in the lab. Research and bench work came natural for him. With a short period of time, he has learned and mastered several experimental techniques commonly used in the cancer research field and he was able to work independently. In addition, he is not afraid of trying new experiments; and he is always open and responsive to critiques to improve his performance." Warren will be continuing his education in medical school at U of L.

Luke Meredith was nominated by Preetha Shridas, Associate Professor in Internal Medicine. Dr. Shridas related "Luke has demonstrated exceptional dedication and passion for research, establishing himself as an outstanding research student. His commitment and talent set him apart as one of our most impressive undergraduates. Luke has authored two recent peer-reviewed research publications from our laboratory, a testament to his remarkable abilities." Luke is currently employed at UK and plans to work in the field of astrobiology.

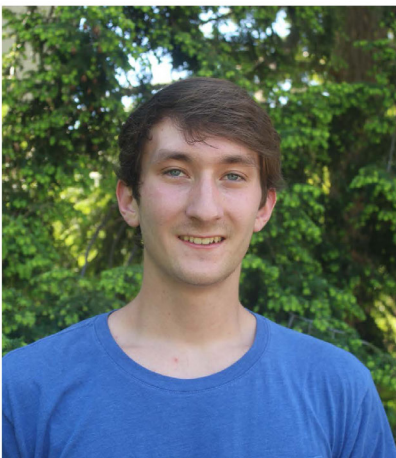
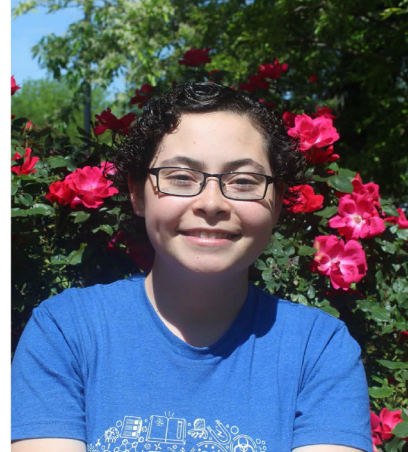
Caroline Benda has been a part of Sarah D'Orazio's lab for over two years. Dr. D'Orazio, Associate Professor in the Department of Microbiology, Immunology and Molecular Genetics, reported that "Caroline grew bacterial cultures for six different *Listeria* strains, isolated RNA from each, generated cDNA, and performed quantitative RT-PCR to assess the relative level of *inlB* expression in our neurotropic strains relative to reference strains of *Listeria*....She found that our neurotropic strains did not express elevated levels

of *inlB*, which suggests that our neurotropic strains are using an alternate method of dissemination to the brain. Her data will be included in a paper that I expect to be submitted this summer, and Caroline will be an author on the paper." Caroline will continue her studies for a Ph.D. in the Integrated Biomedical Sciences Program at UK.

Justin Wong received his nomination from Dr. Nicole Gauthier, Extension Plant Pathologist Professor for Specialty Crops. Dr. Gauthier's related that "Mr. Wong took on the challenge and designed experiments for testing disinfestation methods – from greenhouse inoculations to quantifying DNA to analyzing data. In the coming months, we will be submitting Mr. Wong's first-authored manuscript to Plant Health Progress." Justin will continue his studies in a Master's program at the University of Colorado.

AMBER recipients, **Caroline Harper** and **Xiomara Arias**, will complete their senior year of college in the upcoming academic year. Caroline Harper received her nomination from Dr. Patrick Hannon in the department of Obstetrics & Gynecology. Dr. Hannon shared that "in the laboratory, Caroline handles instruction really well and asks thoughtful questions when learning new skills. She has excelled learning our biomolecular techniques to where she can now independently conduct projects at her own pace. The speed at which she gained independence has been remarkable for someone in a laboratory for the first time. Caroline is already a leader in our laboratory that can be relied upon to instruct new personnel."

Xiomara Arias was nominated by Dr. Ted Kalbfleisch, professor in the Department of Veterinary Science. Dr. Kalbfleisch related that Xiomara "has given two poster presentations at international meetings on the subject (of genetic basis for idiopathic abortions in livestock) and has used this research in her AMBT coursework. She recently applied and was enthusiastically accepted into the department of Veterinary Science University Scholars Program aimed at attracting gifted undergraduates to a program that can accelerate their graduate study. Xiomara is intelligent, inquisitive, energetic, and hard working. She has made great progress toward becoming a researcher in the two years I have known her. This is evidenced by her ability to thoroughly understand the subject matter, and to ask the important questions that will lead to meaningful hypotheses that I am certain will one day serve as the basis of (an) independent research program."



THE AGRICULTURAL AND MEDICAL BIOTECHNOLOGY
EXCELLENCE IN RESEARCH AWARD RECIPIENTS

2023-2024 Academic Year

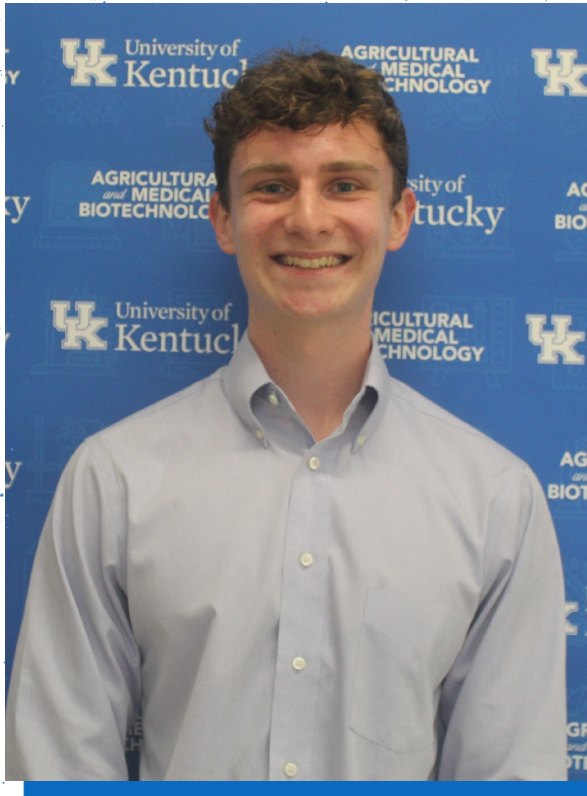
Top Row; L to R: Warren Van Nort, Justin Wong,
Caroline Benda, Xiomara Arias

Bottom Row; L to R: Caroline Harper, Luke Meredith

“I have been given a greater respect for the duty that we, as undergraduates, are taking upon ourselves in pursuing careers in science. It is our generation’s responsibility to carry forth the strides being made in research now. It is our commission to think critically about new advancements in technology and how they alter our world.

It is the job of an educational institution to not only teach you skills, but to also teach you to learn how to adapt and apply experiences to novel situations. I believe that the Agricultural and Medical Biotechnology major equips its students with the ability to think critically about any task set before them.”

-Xiomara Arias



THE GLENN B. COLLINS UNDERGRADUATE RESEARCH AWARD IN AGRICULTURAL BIOTECHNOLOGY AWARD

Warren Van Nort is the Spring 2024 recipient of the Glenn B. Collins Award. Warren completed his research project in Professor Tianyan Gao's research lab in the Department of Molecular and Cellular Biochemistry. His winning presentation was entitled "Characterizing the role of protein tyrosine phosphatase receptor type F (PTPRF) in regulating the c-met signaling pathway in colorectal cancer".

Honorable Mentions go to Jada Gordon and Bailey Swart. Jada presented her research on "Production and characterization of bacterial cellulose produced from agricultural wastes" mentored by Dr. Kendall Corbin in the Department of Horticulture. Bailey's presentation was entitled "Effects of climate change on genome stability of *Saccharomyces cerevisiae*" mentored by Dr. Eva Goellner in the Department of Toxicology and Cancer Biology, College of Medicine.

XIOMARA ARIAS PARTICIPATES IN THE INTERNATIONAL PLANT AND ANIMAL GENOME CONFERENCE

Hello! My name is Xiomara Arias, and I am a junior in AMBT. I started at UK on a pre-vet track, but while finding a research mentor for our ABT 395 project, I quickly discovered I was more interested in pursuing equine genetics research than being a veterinarian. During my sophomore year, I had my first opportunity to explore the world of bioinformatics with Dr. Ted Kalbfleisch and I have been hooked ever since!

Bioinformatics is where computer science aids biological studies. The massive amounts of data contained in each and every organism's genome is able to be analyzed and interpreted through the power of computer programs. The Kalbfleisch lab focuses on exploring the genomes of horses, cattle, sheep, yak, and rats. Currently, Dr. Kalbfleisch has me engaged with identifying deleterious recessive alleles using idiopathic abortions and exploring the impact of these deleterious recessive alleles using computer simulations.

This past January, with help from an MG-CAFE travel grant, I had the chance to attend, for a second time, the annual Plant and Animal Genome Conference in San Diego, California. I was able to present our lab's work on discovering deleterious recessive alleles in livestock. The conference was an eye-opening opportunity! I was able to network with scientists in the equine research community and learn about the latest discoveries in the horse genetics field.

Having been exposed to these opportunities, I have decided to continue my education in bioinformatics. I am blessed to be the first student accepted into the Veterinary Science and AMBT University Scholars Program, where I will complete my master's degree in Dr. Kalbfleisch's lab. I am grateful to be a part of the AMBT program, whose dedicated group of professors and scientists have aided my educational growth and helped paved my way to academic success and preparation for the future. **-Xiomara Arias**





BOTSHELO ANGOMA AWARDED THE PRESTIGIOUS GAINES FELLOWSHIP

Botshelo Angoma was named one of this year's UK Gaines Center for the Humanities Undergraduate Student Fellows. Each year, the Gaines Center selects only a handful of students for this highly competitive undergraduate fellowship. The fellows come from a variety of backgrounds and majors, with a common interest in the humanities.

Botshelo's award is a huge accomplishment. He will embark on a two-year, humanities-focused program with his cohort that will culminate in a thesis project exploring a new area of scholarship or creative work. Botshelo is from Johannesburg, South Africa. He is studying Psychology and Agricultural and Medical Biotechnology. Fascinated by the intersection between psychology and medicine, he pursues interests in psychological expression and healthcare. In his spare time, he works as a tutor and enjoys playing the piano, painting and film making. His film "Dancing Circles" was nominated for the Best Experimental Film category for the UKY Student Film Festival this spring.

This summer, Botshelo is participating in the Students Participating as Ambassadors for

Research in Kentucky (SPARK). Botshelo has a strong passion for the pursuit of science. Throughout his college career, he has tailored an academic experience that is predominantly STEM. However, he still holds a great interest for creative disciplines in the humanities. Therefore, the Gaines fellowship serves as the perfect union of scientific inquiry and creative expression. During his freshmen year, he took an art history class and found it incredibly exciting to learn about the influential role creativity plays in describing and shaping a culture. In another life, he would probably major in Art History. He hopes to explore his passion for renaissance art in his Gaines senior thesis.

One of his favorite Renaissance artists is an Italian painter named Caravaggio. He admires Caravaggio's unorthodox approach in his creations which often aimed to oppose the standard norms of art at the time. Botshelo strongly resonates with this sentiment and hopes to express his interest in art throughout his college career. He is incredibly grateful for the opportunity to explore his passion for the humanities through the Gaines community.



AMBT SOLAR PARTY

On April 8th, a 96% eclipse occurred in Lexington Kentucky around 3:00PM, due to a majority of Kentucky being barely outside of the totality pathway. The Agricultural & Biotechnology Club hosted a viewing party on the University of Kentucky's campus, in front of the Chem-Phys building at Alumni Commons. The event promised a safe and educational viewing of the annular solar eclipse for its members. Many students and workers from different clubs and programs gathered in this area as well to view the solar eclipse. The AMBT members received solar eclipse glasses that were official and safe from a member that donated them. This allowed all members that attended the solar eclipse viewing party to watch the eclipse directly and safely.

The event kicked off around 1:30pm and club members set up sidewalk chalk and corn hole for attendees to enjoy during the wait for the eclipse. Esther Fleming, the AMBT academic coordinator, brought and set up a snack cart for members to enjoy along with non-direct ways to view the eclipse. A few methods of non-direct viewing were attempted with strainers or structures made from cardboard. During the anticipated wait, Dr. Tomokazu Kawashima, AMBT faculty and plant science researcher, gave a guest speech about what happens to plants during the eclipse. Dr. Tomo engaged students who were curious about what happened to plants during this event and explained the basis of what plants go through during the day and night. Since eclipses do not happen often or are not long events, he explained that plants have not formed a known adaptation or response.

The atmosphere of the event was festive with many students, professors, and other workers waiting in anticipation for the eclipse. Many were able to hang out with their friends or fellow members of the AMBT club. As the eclipse occurred it was unfortunately cloudy, only offering small windows of opportunity to see the eclipse. During those small windows of viewing, you could hear the cheering of many excited students watching the eclipse and trying to get photos of the occurrence. After the eclipse occurred, several members of the club remained to talk to one another. Slowly, members started to leave the area to get back to their studies or their late afternoon classes.

The social event's success had provided a memorable experience for AMBT members and their friends. It provided an opportunity to be able to relax, do activities, and connect with other members or faculty. The several members that heard Dr. Tomo's talk gained newfound understanding of plant science. This event may have not featured a total solar eclipse, but it allowed fond memories to be made and many to connect during an event that will not occur in the United States again until August 23, 2044.

– **Ashley Morrison**, AMBT Club Social Media Chair



L to R: Lucca Madeo Cortarelli, Olga Tsyusko, Ph.D., Dr. Carlos Rodriguez Lopez, Ph.D., Dr. Lou Hirsch, Ph.D., Dr. Nathan Vanderford, Ph.D., Dr. Eva Goellner, Ph.D., and Colin Haase.

AMBT TEACHERS WHO MADE A DIFFERENCE

The AMBT Community was highly represented at the 2024 "Teachers who made a Difference" award ceremony sponsored by the College of Education.

Left to Right: AMBT alum Lucca Madeo Cortarelli honored **Dr. Olga Tsyusko**. Lucca is currently working on his Ph.D. in Dr. Tsyusko's lab. Dr. Tsyusko also teaches ABT 460. **Dr. Carlos Rodriguez Lopez** (ABT 301) was honored by our graduating senior, Gretchen Ruschman. **Dr. Lou Hirsch** was honored by AMBT students, Carter Akers, Caroline Harper and Lucy

Thomas. AMBT Alum, **Dr. Nathan Vanderford** was honored by first year medical student and AMBT alum Jessica Lamb. **Dr. Eva Goellner**, AMBT research mentor, was honored by AMBT student Colin Haase. **Christopher Crutchfield**, AMBT academic advisor was honored by AMBT freshman Teja Sriram.

We applaud these teachers who unselfishly continue to give of themselves and make a difference in their students' lives!

SHOUTOUT TO OUR UNDERGRADUATES!

Chase Eastham and **Nolan Marcum** presented their research posters in Frankfort at the "Posters at the Capitol" event on March 7.

Cooper Samuelson, **Katie Christensen**, **Xiomara Arias** and **Sophia Zhou** received 2024 M-G CAFE Undergraduate Research Travel Grants.

Botshelo Angoma was selected a 2024 Gaines Fellow. Botshelo is also participating in the Students Participating as Ambassadors for Research in Kentucky (SPARK) program.

Megan Johnston and **Gretchen Ruschman** along with several other UK students, co-founded a new journal dedicated to undergraduate research. The formation of Aperture Journal of Undergraduate Research began in June 2023. The first edition was available June 1.

Sophia Zhou received first place in the undergraduate student paper competition at the Entomological Society of America

North Central Branch annual meeting. Sophia's talk was titled "Computational inference of thermal tolerance across insect taxa."

Nolan Marcum was selected to participate in the summer 2024 Commonwealth Undergraduate Research Experience (CURE). Nolan is working in the cancer research priority area.

Katie Christensen and **Cooper Samuelson** received the 2024 Sustainability Summer Research Fellowship.

Alyssa Chiarello was selected into the 2024 class of Chellgren Student Fellows.

Megan Johnston for receiving the Excellent Undergraduate Research Ambassador Award for the 2023-2024 academic year.

Ellen Williams is one of three UK students who received the US State Department's Critical Language Scholarship. Ellen will study Bahasa Indonesia at the Universitas Negeri Malang in Malang, Indonesia for 10 weeks this summer.

Who's Who in AMBT

SHOUTOUT TO OUR ALUMNI!

Ilavezhil Iniyavan graduated from UK with a Master's in Forensic Toxicology and Analytical Genetics.

Cheyenne Chandler graduated from UK with a Master's in Medical Science.

Amanda Fiedler graduated from UK with a Master's in Medical Science.

Kia Davis graduated from UK with a Master's in Forest and Natural Resource Sciences.

Devin Montgomery graduated from UK with a Doctor of Pharmacy and a Master's in Pharmaceutical Sciences.

Thomas Sanders graduated from UK with a Master's of Science in Physician Assistant Studies.

Katelyn Cox graduated with a Doctor of Medicine from UK.

Evan Hall graduated with a Doctor of Medicine from UK.

Henry Moore graduated with a Doctor of Medicine from UK.

Joseph Stuart graduated with a Doctor of Medicine from UK.

Melhem Zaharia graduated with a Doctor of Medicine from UK.

SHOUT OUT TO OUR FACULTY!

Shout out to several of our AMBT faculty for the awards they received at the spring M-G CAFE faculty meeting:

Dr. Tomo Kawashima -The Bobby Pass Excellence in Grantsmanship Award

Dr. Emma Adam - The Prestigious Research Paper Award

Dr. Chuck Fox – The Prestigious Research Paper Award

Dr. Ted Kalbfleisch received the Undergraduate Research Mentor of the Year sponsored by the Office of Undergraduate Research. Dr. Kalbfleisch was nominated by Xiomara Arias.

Dr. Lou Hirsch for receiving the Excellence in Teaching Award from the American Phytopathological Society. This national recognition is awarded once a year to a plant pathologist who effectively teaches one or more plant pathology courses.

Dr. Aardra Kachroo was recently recognized by the American Society of Plant Biologists as one of 25 inspiring women in plant biology.



SPRING 2024 AMBT SENIOR SEND-OFF

On the evening of May 3, we celebrated with 19 of the 27 graduating seniors at the AMBT Senior Send-Off. The event occurred in the newly renovated Cooper House, thanks to the hospitality of the M-G CAFE Alumni Association. During a short program, each graduate was recognized for their unique contribution to our program. Many family members, friends and loved ones contributed to the celebratory air in the great space of Cooper Hall.



**Class of 2024
Agricultural &
Medical
Biotechnology**

