

GRADPULSE

THE UMES GRADUATE NEWSLETTER

AN OFFICIAL PUBLICATION OF THE UNIVERSITY OF MARYLAND EASTERN SHORE

November 2025 Edition

Vol. 1



GRADUATE STUDENT HIGHLIGHTS

- *Dr. Haywood's Path from PhD to Professor*
- *Empowering Communities Through Urban Agriculture and Food Preservation*
- *The Future of UMES Graduate Education*
- *Watching Space from a Balloon*
- *UMES Graduate School in Paris*
- *Doctoral Student Develops Novel Pixelscope App for Image Analysis*
- *ORLD Student Selected for Prestigious NIST Research Experience*
- *Healing the aging bone*
- *Serving where you stand...*

Welcome to the First Edition of the UMES Graduate School Newsletter!

We are excited to launch this inaugural issue, created to celebrate the achievements, milestones, and growth of our graduate community. From student successes and alumni highlights, this newsletter is designed to keep you informed, inspired, and connected. Whether you're a current student, alumni, faculty member, or friend of UMES, we invite you to explore the stories that showcase the power of graduate education and the impact we are making locally and globally.

Together, let's continue building a vibrant community of scholars and leaders who are shaping the future.

Dr. LaKeisha Harris, Dean, UMES School of Graduate Studies

THE FUTURE OF UMES GRADUATE EDUCATION: A VISION FOR EXCELLENCE

BY DR. WELE ELANGWE

UMES SCHOOL OF GRADUATE STUDIES

As UMES continues its upward trajectory as a research-driven, student-centered institution, the School of Graduate Studies is shaping a future grounded in innovation and global impact. Over the past years, graduate enrollment has grown steadily, fueled by renewed academic partnerships, enhanced funding opportunities, and an expanding network of research initiatives.

A major milestone has been the establishment of the Graduate Writing Center, a hub providing coaching, workshops, dissertation/thesis support, and writing mentoring. Feedback has been positive and graduate students who engage with the center report stronger writing confidence, improved research productivity, and increased publication readiness.

Additionally, the UMES Graduate School has deepened its global footprint through international conference participation, visiting scholars, and new collaborations with institutions across Africa, Asia and Europe. These partnerships are broadening research experiences, connecting UMES students with global experts, and positioning the university as a rising leader in inclusive and community-anchored research.

As we look ahead, the School of Graduate Studies remains committed to expanding assistantships, strengthening cross-disciplinary research teams, and creating pathways that prepare students for leadership, whether in academia, industry, government, or entrepreneurship. The future is bright, and our graduate scholars are at the center of it.

STUDENT SUCCESS SPOTLIGHT

Graduate Students Making an Impact Across Campus

Graduate students are not only scholars, they are mentors, innovators, and community builders. This semester, several UMES students demonstrated the power of leadership through service:

Graduate Resident Leaders

Across residence halls, graduate community managers supported more than 900 students with programming, conflict resolution, and wellness initiatives. From culturally themed dinners to “De-Stress Nights,” graduate leaders created safe spaces where UMES students could belong, grow, and thrive.

Graduate Mentors in STEM

Through the STEM EXCEL Peer Mentorship Program, graduate students mentored undergraduates in mathematics, engineering, and agricultural sciences. Their support helped undergraduates navigate complex coursework and explore research-based career pathways.

Community Health Ambassadors

Students in Rehabilitation Counseling, Physician Assistant Studies, and Public Health joined forces to deliver workshops on mental health, nutrition, and substance abuse prevention. These sessions reached middle schools, shelters, and community centers across the Lower Eastern Shore.

These examples remind us that leadership isn’t always loud, it often shows up in acts of service, collaboration, and compassion. UMES is proud of the graduate leaders who continue to uplift our campus and community.

RESEARCH & INNOVATION

Emerging Research Areas to Watch at UMES

Graduate research at UMES spans a diverse portfolio of cutting-edge topics. Here are four fast-growing areas where UMES scholars are making nationally relevant contributions:

1. Regenerative Medicine & Drug Delivery

From stem-cell-based therapeutics to biomaterials for aging tissues, UMES researchers are tackling the biological challenges of healing, aging, and chronic disease.

2. Smart Agriculture & Climate-Resilient Food Systems

Students in the Food and Agricultural Sciences program are leading studies on hydroponics, food preservation, nutrient-enhancing crops, and sustainable technologies for smallholder farmers.

3. Artificial Intelligence & Mechatronics

Student-developed innovations, such as high-altitude balloon imaging tools and custom-built image-analysis software, are contributing new insights in automation, aerospace, and environmental monitoring.

4. Human-Centered Cybersecurity

Through the new partnership with NIST’s Professional Research Experience Program, graduate researchers are shaping national conversations around digital safety, usability, and cybersecurity standards.

UMES is becoming a hub where creativity meets impact, where graduate students turn ideas into innovations that address real-world problems.

CHARTING NEW FRONTIERS: UMES ALUMNA DR. HAYWOOD'S PATH FROM PHD TO PROFESSOR

BY DR. PATRICE AYOTUNDE-JACKSON
PROFESSOR, PHARMACEUTICAL SCIENCES



Dr. Rhashanda Haywood earned her PhD in Pharmaceutical Sciences from the University of Maryland Eastern Shore under the guidance of Dr. Patrice Jackson-Ayotunde in December 2024.

Her work involved the early drug design and discovery of small organic molecules as potential anti-seizure agents with a focus on

hit-to-lead optimization studies to design a library of T-type voltage-gated calcium channel blocker. Her work involved the early drug design and discovery of small organic molecules as potential anti-seizure agents, with a focus on hit-to-lead optimization studies to design a library of T-type voltage-gated calcium channel blocker.

After graduation, she began her postdoctoral work at the University of North Carolina at Chapel Hill as a UNC Seeding Postdoctoral Innovators in Research and Education (SPIRE) fellow from September 2024 to August 2025, researching the development of chemical probes to understand neurotransmitter signaling in Kevin Frankowski's lab at the Eshelman School of Pharmacy.

Dr. Haywood recently started her academic career as an Assistant Professor of Biochemistry on tenure-track in the Department of Chemistry and Biochemistry at North Carolina Central University in Durham, NC.

Dr. Haywood's Tips for Making it Through Graduate School

- Always remember your WHY.
- Why did you start your PhD journey? You will need this reminder to keep going when things get tough!
- Build a strong support system; one cannot get through a PhD alone!
- If God brought you to it, he will definitely bring you through it!

Although challenging, difficult, and sometimes stressful, graduate school prepared me for my current role as an Assistant Professor.

Dr. Rhashanda Haywood's journey from UMES doctoral student to tenure-track professor exemplifies the power of perseverance, purpose, and passion for scientific discovery. As she continues to pave new paths in biochemistry and higher education, her story serves as an inspiring reminder to current graduate students that challenges can become stepping stones and that with faith, community, and determination, the possibilities are limitless.

EMPOWERING COMMUNITIES THROUGH URBAN AGRICULTURE AND FOOD PRESERVATION

BY LUCY W. NJOROGUE
M.S. FOOD AND AGRICULTURAL SCIENCES

This summer, from June to August 2025, I had the incredible opportunity to contribute to the Indoor Urban Sustainable Agriculture with Emergent Technologies (IUSAET) and Summer Enrichment Academy in Sustainable Agriculture and Robotics (SEASAR) workshops at UMES. The project was a deep dive into the entire lifecycle of indoor farming to the final food preservation and storage under the theme: "From Farm to Table". My training began with learning and understanding Good Agricultural Practices and the operation of automated farm bots, before progressing to the heart of the project: food processing. Under expert guidance, I learnt to safely operate industrial canning and steam blanching machines, transforming fresh harvests into shelf-stable goods and gaining hands-on skills in food preservation that reduce waste and maintain nutritional value. The culmination of our work was a series of community workshops we helped lead in August. I engaged with local high school teachers, community members, and students, guiding them through hands-on demonstrations in the food processing and robotics labs. From explaining the science of canning to demonstrating a vertical tower garden at an agricultural fair, it was inspiring to see the participants' expression of joy in understanding the technologies demonstrated.

This experience was an invaluable lesson in how technology, education, and sustainability can converge to strengthen local food systems. It reinforced my passion for creating tangible solutions to food security challenges and showed me the profound impact of sharing that knowledge with the next generation of innovators.



(a)

(a) Agricultural Fair held at the UMES Education and Demonstration Farm. From Left: Portia Nkurumah, Lucy Njoroge, Phillip Alsop, Nabin Khadka and Dr. Madhumi Mitra displaying the vertical tower garden at the booth



(b)

(b) Lucy Njoroge leads the participants in a hands-on demonstration of food preparation steps before blanching

WATCHING SPACE FROM A BALLOON – MY SUMMER 2025 EXPERIENCE

BY SAMUEL VINCENT KIKILE

PH.D. MECHATRONIC ENGINEERING



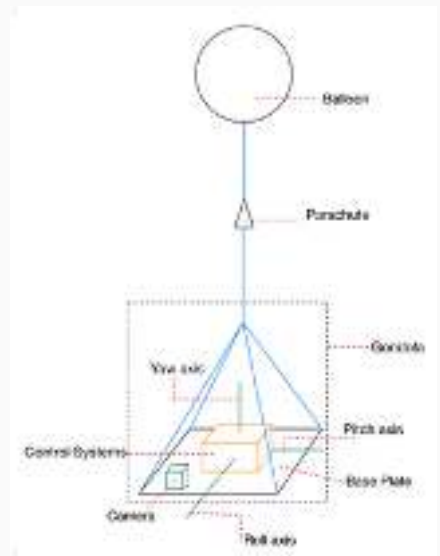
Being a PhD student in Mechatronic Engineering in the Applied Computing and Engineering Department at UMES has been inspiring as well as intriguing. Delving into research in areas I never intended takes the experience to a whole new horizon. Last summer was fun as my professor, course mate and I embarked on an adventure looking at the behavior of noctilucent clouds in space. These clouds already have the attention of space enthusiasts and ultimately get organizations such as NASA concerned. The brewing concern stems from the fact that Noctilucent clouds are perceived to have some bearing over earth's radiative balance and global warming within the context of climate studies.

Commonly put, Noctilucent clouds (NLCs) are one of the emerging atmospheric phenomena. They are the highest clouds in the atmosphere, residing in the mesosphere. NLCs are formed when water freezes into ice crystals to become meteor dust and sundry

particles high in the sky. Such clouds are only visible during twilight or night-time in summer months at middle to high latitudes (approx. 50°-60° North and South) and occur at heights up 76km to 85km (24900 ft to 279000ft). NLCs often exhibit a tenuous wavy pattern and as such are a dazzling sight in summer skies. However, as dazzling and picturesque as their sights could be, they carry a deadly weight of potential adverse effects to our very existence.

To get some insight into not only their behavior but complete formation cycle, we needed to capture consistent images of these cloud formations with high resolution with a camera system that has a stable orientation control during flight. To achieve this, in a very cost effective, easy-to-deploy and functional manner, we had to design a heading control for a suspended gondola beneath a high-altitude balloon at about 30k ft above the ground using a microcontroller-based control system based on Arduino Platform, allowing the gondola to maintain a fixed pre-defined orientation in space. And this was our goal.

The system employs a gyroscope, with some semi-absolute reference, for drift error correction to continuously monitor the gondola's offset angle from target direction. Based on this data, a control algorithm adjusts a reaction wheel set up- often used in satellites and high-altitude systems where there's little or no atmosphere. The foregoing setup includes a spinning flywheel to generate a reaction torque that contracts undesired rotations and realigns the gondola toward its target direction. This ensures that onboard cameras remain pointed consistently at predefined areas of interest in the sky, enabling more reliable image capture for cloud classification and atmospheric analysis. The main elements and/or components that constitute the setup are Arduino UNO R3 controller Board; GY-521 Module (6 axis IMU sensor); SG90 servo motor; LCD 1602 module; Power supply module, 3-6Volt DC motor; L293D IC; Stepper Motor 28BYJ-48 and ULN2003 stepper motor driver module.



There were twists and turns from design to deployment such as minute details of getting a motor to rotate in a specific way or debugging the program code for proper implementation of the hardware to mention a few. working on this project reminded me that graduate study is truly a journey of learning. The process tested both my technical and problem-solving skills but also deepened my appreciation for teamwork and mentorship.

I am grateful to Dr. Persad, who led the project with patience and insight, and to my colleague Ali Shina, whose collaboration was invaluable throughout the design and testing stages. Our hard work paid off when the project was accepted for testing in Alaska last summer — an incredible milestone that filled me with pride and gratitude. As I look forward to another research-filled summer in 2026, I carry with me not just new technical skills, but also a renewed sense of curiosity about the world above us.



ENHANCING FOOD SECURITY THROUGH NUTRIENT-RICH CASSAVA-BASED FOODS

BY ANTHONIA NWAGWU

M.S. FOOD AND AGRICULTURAL SCIENCES



Cassava (*Manihot esculenta*) serves as a key food crop for millions in Asia, Africa, and Latin America, majorly calorie dense and a poor source of protein and other micronutrients. My current research work focuses on enriching the nutritional content of cassava flour through the blending of finger millet flour (*Eleusine*

coracana) also known as Ragi and quinoa flour (*Chenopodium quinoa*), which are both highly nutritious but underutilized food security crops.

The incorporation of Finger millet referred to as a super food with high calcium and dietary fiber, and quinoa, an excellent source of complete protein and essential micronutrients including iron and zinc, with cassava presents gluten-free, nutritious, and affordable flour-based products like bread, cakes, cookies, and dumplings that provide a sustainable substitute to wheat dependence as well as gluten disorder-related issues in few individuals.

The research compares two new blends (40:30:30 and 50:30:20 cassava: finger millet: quinoa composites respectively) with pure cassava flour control. Preliminary results indicate that the new composite flour elevates protein, fiber, and micronutrient content considerably and is a potential tool for addressing undernutrition while boosting food security, especially for vulnerable groups in society.

This research also examines the possibility to grow cassava, finger millet, and quinoa in Maryland's Eastern Shore. If successful, smallholder farmers would be trained on their production as well as utilization to empower rural communities as well as facilitate sustainable food systems.



(A) Cassava processing in the Lab.

(B) Cassava in the field

(C) Finger Millet in the field

(D) Quinoa in the field.

HEALING THE AGING BONE: A RESEARCH JOURNEY AT UMES

BY SHAHRYAR MORADI FALAH LANGEROODI

PH.D. PHARMACEUTICAL SCIENCES



Shahryar Moradi Falah Langeroodi's scientific path has spanned three countries, multiple disciplines, and a steadfast commitment to improving patient health. one study, one stem cell, and one healing bone at a time.

After earning his Pharm.D. in 2020 in Iran—where he specialized in drug delivery and polymer-based delivery systems—he went on to build clinical pharmacy experience and later contributed to mental health and addiction research at St. Michael's Hospital in Toronto.

In August 2025, Shahryar began a new chapter as a Ph.D. student in Pharmaceutical Sciences at UMES, working under the mentorship of Dr. Jiabing Fan. Dr. Fan's laboratory focuses on stem-cell-based drug delivery and regenerative medicine, an area that aligns seamlessly with Shahryar's background and long-term passions.

Today, his research centers on developing advanced drug delivery systems for mesenchymal stem cells (MSCs), with a particular focus on aging and age-related bone disorders. A critical question driving his work is why wound and fracture healing in older adults often results in fibrosis, scar-like tissue, rather than true regeneration. By unraveling this biological shift, Shahryar and his team hope to create new therapeutic strategies that support healthier, more effective bone healing in elderly populations.

For Shahryar, this work is not only scientifically compelling, it is equally personally meaningful:

"This research brings together everything I care about—pharmaceutics, regenerative medicine, and helping older adults maintain quality of life," he reflects.

With enthusiasm and determination, he aims to contribute discoveries that may one day restore normal healing processes and improve outcomes for aging patients.

Through his research, Shahryar is helping shape the future of regenerative therapeutics—one study, one stem cell, and one healing bone at a time.

STUDENT-BUILT AND MARKET-READY: DOCTORAL STUDENT DEVELOPS NOVEL PIXELSCOPE APP FOR IMAGE ANALYSIS

BY CHIBUNKEM ASUZU

PH.D. APPLIED COMPUTING ANMD ENGINEERING



Pixelscope is an image analysis tool designed to assist in image-based measurements of fluid interfaces and other complex objects. It combines classic techniques like Canny edge detection with linear-regression calibration and an interactive interface that helps users extract precise measurements from a wide range of image types. Designed with transparency and user control in mind, Pixelscope includes pixel-level zoom for selecting exact line endpoints, a slider to blend between the original and edge-detected images, and automated Excel export to streamline the transition from visual inspection to quantitative analysis.

Pixelscope was developed as a collaboration effort between me and Dr. Persad to aid in the analysis of video stills from his UMES spaceflight payload, which investigated fluid mechanics behavior in microgravity. In microgravity environments, such as on the International Space Station, fluids behave very differently than they do on Earth: they float, form spheres, and behave in ways that are hard to predict. Even basic tasks like drinking refilling containers, or managing waste systems become engineering challenges.

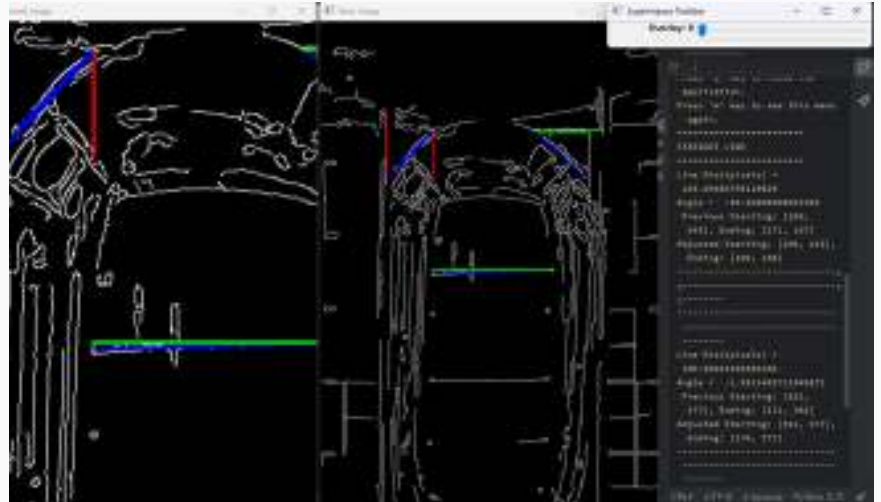
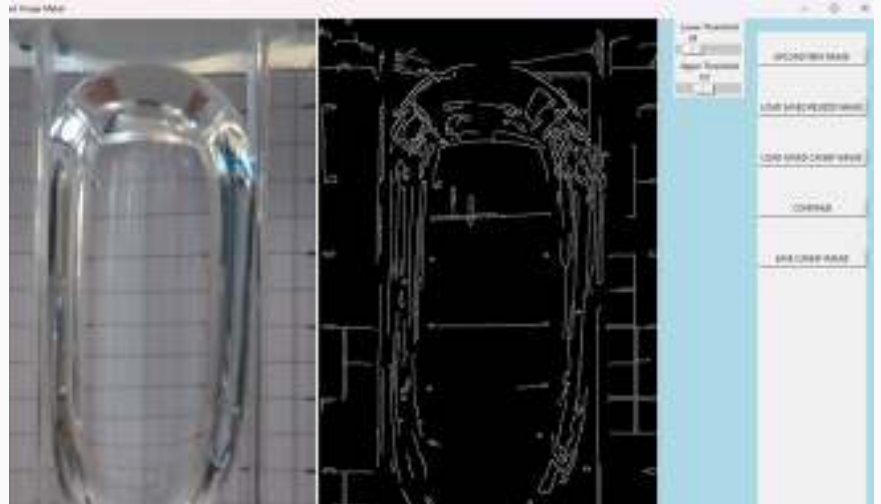
Understanding these dynamics is crucial for developing safer and more reliable fluid-handling systems for spaceflight. Once we began examining the payload footage, we realized that most existing fluid-analysis tools weren't built to handle real microgravity data. Many rely on clean, high-contrast images, opaque automation, or calibration methods that offer little room for verification. This makes it difficult to trust measurements, especially when dealing with noisy, unpredictable imagery from an actual spaceflight experiment.

To address these limitations, I built Pixelscope around transparency and user control. Instead of hiding decisions behind automated processing, the software lets users inspect every step of the measurement process at the pixel level before converting it into real-world units.

This approach allowed us to extract reliable data from frames that standard software would have discarded. Pixelscope directly supported our analysis of interface behavior in microgravity and improved the accuracy and reproducibility of the measurements used in the study.

Beyond its immediate applications, Pixelscope contributes to broader work in image analysis and interpretation by demonstrating how interpretable, efficient vision tools can enhance data reliability. The software continues to evolve through iterative refinement, with ongoing development available on GitHub.

Working on this project with Dr. Aaron Persad has been a meaningful part of my development as a PhD student. His mentorship, collaborative approach, and willingness to involve me deeply in the research played a major role in shaping both the direction of Pixelscope and my growth as a researcher. The project has strengthened my understanding of how careful measurement and transparent tools elevate scientific reliability. I am excited for what the future holds for Pixelscope.



BECOMING THROUGH SERVICE: MY JOURNEY IN THE REHABILITATION COUNSELING PROGRAM

BY JULIET ADAOBI OKEKE

M.S. REHABILITATION COUNSELING



When I began my Master's program in Rehabilitation Counseling at the University of Maryland Eastern Shore, I didn't have all the answers. What I had instead was curiosity, and a quiet conviction that wherever compassion meets learning, something meaningful must emerge.

My first role as a Graduate Assistant was in the Department of Rehabilitation Counseling. It was an office with individuals from diverse backgrounds, and the quiet determination of people who wanted to help others find their footing again. I assisted with research, assisted with recruiting grad students, arranging files and learned that every file represented a person, a story of hope, resilience, and possibility. Then came the second semester, and Dr. Gere Bryan started teaching us Vocational Counseling. This course changed how I understood work. Before, I thought a job was simply what one did to survive. But as I sat in class and listened, I began to see the sacred thread connecting work to body, mind, and soul. I learned that choosing a career aligned with passion, interest and values is not indulgence, it is wisdom. It means to work, not just to live, but to live well.

My curiosity led me next to the Center for Access and Academic Success (CAAS). I remember approaching Ms. Esther Dabipi, the Student Success Coordinator and Director for Non-Traditional Students with so much enthusiasm, as I explained that I was willing to volunteer, to gain experience doing what I was learning. Coming from a community where helping one another is not an act of charity but of kinship, I found the experience deeply fulfilling. Each student I reached out to reminded me that growth happens in circles, that we rise by lifting others.

Soon after, I joined the Office of Residence Life as a Community Manager. There, my classroom learning met real life. I managed Plaza Hall, a community housing the 2024 summer bridge female residents, University Terrace, a residence hall that housed over 300 female freshmen students, each arriving with her own blend of excitement, fear, and hope. Currently, I'm managing Harford Hall, the Honors Residential Hall. These roles stretched me, they required patience, empathy, and an understanding of cultures beyond my own. But they also grounded me. I found creative ways to connect, sometimes through



something as simple as food. Cooking has always been my love language, a way to gather people and nurture them. At one of our community events, "Dinner + De-Stress Night," my team and I prepared chicken Rasta pasta alongside one of my favorite pasta jollof dishes. The aroma alone softened the air. Between laughter and plates, I spoke to my residents about test anxiety, self-care, and peer support. We shared strategies, resources, and encouragement, and that night, the hall felt more like a home.

Looking back, I see how the Rehabilitation Counseling program has not only sharpened my intellect but deepened my humanity. It has taught me that healing and growth are not abstract ideas, they live in small acts of listening, teaching, cooking, and showing up. Through my dual internship sites at the Counseling Center, and the Alcohol, Tobacco and Other Drugs (ATOD) Prevention Center, University of Maryland Eastern Shore, I am still becoming, as a counselor, as a woman, as a bridge between cultures and stories. But if there is one thing this journey has taught me, it is that to serve is to become more of who we are meant to be.

MOMENTS OF IMPACT: NEW GRADUATE STUDENT ORIENTATION FALL 2025





PRISCILLA KINI IN DENMARK



JULIET OKEKE AT DINNER +
DE-STRESS NIGHT



PHARMACEUTICAL SCIENCES STUDENTS VISIT ASTRAZENECA



UCHENNA NWONYE AT SOMERSET
ROOTS & WINGS PROGRAM



PRISCILLA KINI IN DENMARK



BRIONNA PALMER AT THE US CAPITOL



SANDASH CHAPAGAIN IN THE LAB

GRAD *Lens*



UMES DPT GRADUATING CLASS
SEPTEMBER 2025



LUCY NYOROGHE AT IUSAET & SEASAR

INVESTIGATING SALMONELLA IN PETS AND PET FOODS: PROTECTING HEALTH AT THE PET-HUMAN INTERFACE

BY RICHARD YAW OTWEY
PH.D. FOOD AND AGRICULTURAL SCIENCES



As pets become beloved members of our families, the food we serve them is held to higher expectations of safety and quality. Yet, beneath the growing market for premium foods lies an emerging public health concern: the potential for zoonotic pathogens such as Salmonella to move silently between pet food, pets, and their human caregivers.

My project, titled “Investigating the Prevalence, Antimicrobial Resistance, and Genomic Characterization of Salmonella in Commercial Pet Foods and Household Pets in the Lower Eastern Shore of Maryland,” seeks to determine how

Salmonella one of the leading causes of foodborne illnesses circulates within the pet-food-environment interface and to explore practical interventions to control it, targeting commonly overlooked sources of cross-contamination in homes. This applied angle connects laboratory science to real-world behavior, offering pet owners evidence-based guidance on how to minimize infection risks.

The results being generated is providing baseline data on Salmonella prevalence and antimicrobial resistance in pet foods and pets from the Lower Eastern Shore of Maryland; an area where such data are currently lacking.

Preliminary data indicate the presence of multidrug-resistant Salmonella in Pet and Pet food, which is a serious public health concern. By combining microbiological testing, antimicrobial profiling, and genomic insights, the research aims to clarify whether the same Salmonella strains are shared across food, pets, and the environment. Such linkages could reveal hidden transmission pathways that threaten both animal and human health.

Ultimately, this project underscores UMES’s commitment to advancing pet food safety and one health research by bridging animal care, environmental stewardship, and public health protection. It also addresses the critical area of companion animal health and safety, aligning with and contributing to the mission of the newly proposed School of Veterinary Medicine at UMES.



HEALING THE AGING BONE: A RESEARCH JOURNEY AT UMES

BY BRIONNA PALMER
MMS. PHYSICIAN ASSISTANT STUDIES



This September, I represented six states, and their physician assistant programs in the Mid- Atlantic region as a student board director for the American Academy of Physician Associates (AAPA), the largest organization representing PAs and PA students in the United

States. I attended the 2025 Leadership and Advocacy Summit (LAS) in Washington, D.C., an inspiring weekend dedicated to empowering PAs to lead, advocate, and make an impact on healthcare policy. At LAS, I joined advocacy and leadership sessions that prepared us to meet with lawmakers on Capitol Hill for “Hill Day.” Speaking about the issues that shape our profession reminded me how powerful our collective voice can be. What made the experience truly special were the people. I connected with pre-PA students, current PA students, and practicing PAs from across the country. Each conversation offered a new perspective, a shared story, or an idea for how we can strengthen our impact as future health-care leaders.

I left LAS with a renewed sense of purpose to continue advocating for my peers and patients, and to inspire other PA students to use their voices to shape the future of our profession.



REINTRODUCING NATURE'S HIDDEN HELPERS: HOW ENDOPHYTIC TRICHODERMA STRENGTHENS HYDROPONIC CROPS

BY SHUVONKAR K. BONIK

M.S. FOOD AND AGRICULTURAL SCIENCES

Hydroponic farming is redefining modern agriculture. By growing plants in nutrient-rich water instead of soil, this system uses far less water, requires less land, and enables cultivation in urban or controlled environments where traditional farming is impractical. Yet despite its efficiency and precision, hydroponics lacks one vital component, the living soil microbiome. In natural soil, an invisible network of beneficial microbes surrounds plant roots, helping them absorb nutrients, tolerate stress, and defend diseases. Without these natural allies, hydroponically grown plants often struggle to achieve the same resilience as their soil-grown counterparts. This missing partnership is where endophytic fungi come in. Endophytic fungi live within plant tissues and form mutually beneficial relationships with their hosts. When plants release root exudates, these fungi respond rapidly, colonizing and adhering to the roots before forming a symbiotic network. In return for carbon compounds and nutrients supplied by the plant, the fungi solubilize otherwise unavailable minerals such as phosphorus and iron, improving nutrient uptake and overall plant vigor.

Recognizing this opportunity, my research explores how beneficial endophytic fungi, specifically *Trichoderma* species, can restore this missing microbiological support in hydroponic systems. The study was designed in three phases: a preliminary greenhouse screening, a controlled growth chamber experiment, and a semi-controlled high-tunnel study. In the preliminary phase, eleven *Trichoderma* strains were tested on jute and barley plants grown in a greenhouse to identify which most effectively enhanced plant growth and yield. Based on the results, two promising strains, PGPF 20 and PGPF 29, were selected for further evaluation. The growth chamber experiment used a passive hydroponic system (Kratky method) to observe how these fungal inoculants influenced jute growth under controlled conditions. Six treatments were arranged in a completely randomized design with three replications each. Each replication consisted of six jute plants, totaling 108 plants across the study. Results demonstrated that *Trichoderma* strains PGPF 20 and PGPF 29 significantly promoted jute growth without compromising plant quality.

To validate these findings under more realistic growing conditions, a high-tunnel study was conducted under semi-controlled environments with the same experimental design. Jute plants inoculated with *Trichoderma* exhibited clear improvements in key morphological traits, including plant height, leaf area, and biomass accumulation, compared to uninoculated controls. Enhanced root systems indicated better nutrient uptake and structural stability within the hydroponic setup. Treated plants also maintained higher leaf turgidity and chlorophyll intensity under fluctuating temperature and humidity conditions, suggesting improved physiological efficiency and greater tolerance to abiotic stress. Notably, a consistent reduction in insect incidence—particularly from chewing-type herbivores—was recorded among inoculated plants, which showed fewer feeding marks and minimal leaf damage. This reduced pest pressure may be linked to *Trichoderma*-induced systemic resistance, in which fungal colonization activates plant defense pathways and the production of protective metabolites.

Overall, these results confirm that endophytic *Trichoderma* not only enhances plant growth and nutrient acquisition in hydroponic systems but also strengthens natural defense responses, making plants more robust and resilient. This research bridges the gap between soil-based and hydroponic cultivation, opening the door to more sustainable, biologically active, and self-supporting agricultural systems.



A)



B)

A) Plants are growing in high tunnels
B) After 1st harvesting of jute plants growing in hydroponic Kratky method.

UNRAVELING HEMP'S DEFENSE SECRETS: UNDERSTANDING HOW CORN EARWORM INFESTATION ALTERS CANNABINOID PATHWAYS

BY FREWEYNI M. ABRHA

PH.D. STUDENT IN FOOD SCIENCES AND TECHNOLOGY



As the cultivation of industrial hemp (*Cannabis sativa*) expands across the United States, growers are increasingly challenged by pests that threaten yield and quality. One such pest is the corn earworm (*Helicoverpa zea*), a notorious agricultural pest known for damaging a variety of crops — and now, hemp. My research at the University of Maryland Eastern Shore (UMES) focuses on uncovering how corn earworm infestation affects hemp's biochemical and molecular defense responses, particularly its impact on cannabinoids, jasmonic acid, and the genes responsible for their production.

During the summer of 2025, I conducted growth chamber experiments using two hemp varieties, including Boax and Berry, to compare the physiological and molecular responses of infested and control plants. I quantified major cannabinoids and terpenes to assess how insect feeding alters these important compounds. In parallel, I analyzed the expression of genes involved in the cannabinoid biosynthesis and jasmonic acid pathways. Our findings suggest that corn earworm herbivory activates hemp's defense signaling networks, resulting in measurable shifts in secondary metabolite production and gene expression.

This research provides new insights into hemp-insect interactions and contributes to the broader understanding of plant defense mechanisms in emerging crops. Ultimately, the study aims to inform pest management strategies and enhance hemp resilience through molecular and biochemical insights.



Beyond the lab, this project has strengthened my passion for sustainable agriculture and the molecular biology of plant defense. Being part of UMES's vibrant research community has provided me the opportunity to grow as a scientist and share knowledge that bridges molecular plant biology and real-world agricultural challenges.

ORLD STUDENT SELECTED FOR PRESTIGIOUS NIST RESEARCH EXPERIENCE

BY DR. WELE ELANGWE

UMES NIST PREP HMHC COORDINATOR



"Being a student researcher is more than just an internship—it's a transformative opportunity to apply what I'm learning in real time, contribute to meaningful work, and grow professionally while supporting my academic journey."

Congratulations to Ozioma Okehiem, who has been selected to join the Hopkins-Morgan HBCU Consortium (HMHC) NIST Professional Research Experience Program (PREP). Ozioma will serve as a Human-Centered Cybersecurity Research and Community Standards Development researcher, working alongside scientists at the National Institute of Standards and Technology (NIST).

Through this year-long appointment, beginning October 1, 2025, Ozioma will engage in research with NIST's Visualization and Usability Group under the supervision of Julie Haney (NIST) and mentored by Dr. LaKeisha Harris, Dean of the UMES Graduate School.

The project focuses on advancing cybersecurity through human-centered approaches, developing community standards, and contributing to innovations that enhance both security and usability in today's digital landscape.

This competitive program is part of a national initiative to strengthen the future of U.S. workforce by providing students with intensive, real-world research opportunities.

Ozioma's appointment includes tuition support and professional development mentorship to ensure success both in the laboratory and in the classroom.

We are proud of Ozioma's achievement and look forward to the impact this work will have on the cybersecurity field and the broader UMES graduate community.

SERVING WHERE YOU STAND: VOLUNTEERING WITH THE ROOTS & WINGS PROGRAM

BY UCHENNA NWONYE

ED.D. EDUCATION LEADERSHIP



Volunteering with the Roots and Wings Program in Somerset County has been one of the most transformative chapters of my graduate journey, yet. What I first saw as a course requirement quickly unfolded into a profound lesson in community, culture, humility, and service. It changed how I understood the place where my university is located - Somerset County.

Somerset County in Maryland is a community of long-standing traditions, deep family ties, and rich cultural layers. But behind those connections are very real challenges: financial strain, stress, generational burdens, and the everyday pressures that shape a child's emotional and behavioral world. Roots and Wings, an evidence-based family-strengthening program, allowed me to encounter these realities not as theories or statistics, but as lived experiences. I met families where they were, not where we expect them to be.

Listening to parents share their hopes, uncertainties, and the complex balancing act of raising children in an unpredictable world gave me insights that no textbook could ever offer. Sitting with youth and hearing them articulate their pressures and desire to feel seen, supported, and guided revealed just how essential healthy, mental-health-informed family systems are. And as a parent myself, I resonated deeply with their struggles, the late-night worries, the desire to protect, the pressure to "get it right," despite the adulthood challenges, and the hope for children to grow into stable, independent adults.

Working with a remarkable team of licensed therapists profoundly shaped my growth. *Jeri, Chalarra, Meg, Latrice, and Maria* not only mentored but empowered me, giving me space to lead, learn, and serve with confidence. In countless sessions, they handed me the floor, not because they had to, but because they believed in nurturing leadership through service. Their trust pushed me to think creatively, navigate challenges with poise, and hold space for families with empathy.

Through Roots and Wings, I entered uncertain but left transformed, realizing that true leadership is not about standing above; it is about standing with. My hope going forward is simple: to use the knowledge and training I receive from UMES to uplift the people closest to where I stand. Because service, when done with empathy, humility, and intention, does more than support...It builds the leader in you.

USE OF BACTERIOPHAGE AGAINST MDR SALMONELLA IN DRY PET FOODS

BY SANDESH CHAPAGAIN

M.S. FOOD AND AGRICULTURAL SCIENCES



Pet foods are increasingly becoming a source of Salmonella outbreaks in humans. Though dry pet food kibbles go through a thermal killing step, the post-processing contamination, such as coating and handling, tends to contaminate them with pathogens such as Salmonella. Handling of contaminated pet foods and asymptomatic pets are the potential sources of Salmonella contamination in households. Further, the occurrence of multi-drug resistant (MDR) Salmonella in pet foods predisposes the already immunocompromised population, such as the kids and elderly population more vulnerable. Salmonella-specific bacteriophages could be a potential alternative to chemical additives in pet food, owing to their specificity without altering the sensory properties and concerns of residual chemical agents.

One of the research studies happening in Dr. Dhaksl's lab in the Department of Agriculture, Food and Resources Sciences at UMES aims to evaluate the effect of bacteriophage against MDR Salmonella in vitro and in dry pet food kibbles. In this study, multidrug-resistant Salmonella with different resistance profiles are being tested against the commercially available bacteriophage, Salmofresh®.

The preliminary results show a promising result where bacteriophages are being effective to mitigate MDR Salmonella in vitro as well as in kibbles. This preliminary result shows the potential of bacteriophage to control MDR Salmonella in pet food, thereby potentially safeguarding households from Salmonella contamination originating from pets and pet food.



UMES GRADUATE SCHOOL AT THE IAFOR PARIS CONFERENCE ON EDUCATION

BY DR. WELE ELANGWE
DIRECTOR OF GRADUATE STUDENT SERVICES

This June, I had the privilege of representing UMES at the 4th International Academic Forum (IAFOR) Paris Conference on Education, an international gathering of educators, scholars, and practitioners from around the world. Held at the historic Sorbonne University, often called the Harvard of France, the conference offered a dynamic platform to explore emerging research, innovative practices, and visionary approaches shaping the future of higher education.

I presented my research on *Collaboration as a Self-Leadership Strategy*, expanding on the work of Manz (2015). My session explored how collaboration can enhance self-leadership by fostering expanded access to expertise, support and growth opportunities, mitigating personal blind spots, as well as enhancing personal development skills. In addition to supporting Manz's (2015) concept of self-leadership through collaboration, my research found that collaboration serves as a powerful tool for empowerment but also presents challenges that require intentional navigation to achieve personal effectiveness.

One of the most impactful sessions was a workshop led by Dr. Ujal Ibrahim of the University Canada West, titled "Fostering Inclusive Entrepreneurial Ecosystems: How Colleges and Universities Can Drive Change." Dr. Ibrahim offered compelling strategies for integrating entrepreneurship, social innovation, and inclusivity into academic environments.

This workshop prompted meaningful reflection on how UMES can expand its support for graduate students with entrepreneurial interests, market-ready innovations, creative projects, or socially impactful business ideas.

Participating in the IAFOR Paris Conference was a reminder that our students are scholars, creators, inventors, and problem-solvers. As we continue to provide rigorous academic training, we must also champion their creativity, leadership capacity, and entrepreneurial spirit.

“

I return to UMES inspired, energized, and with a renewed commitment to advancing institutional mechanisms that support student entrepreneurship and innovation. I return carrying with me the spirit of the Eiffel Tower: a symbol of vision, aspiration, and global connection

”



GRADUATE STUDIES STAFF



DR. LAKEISHA HARRIS

Dean
Phone: 410-651-6080
Email: lharris@umes.edu



MRS. ANGELA YOUNG

Administrative Assistant to the
Dean & Designated School
Official (DSO)
Phone: 410-651-7966
Email: adyoung@umes.edu



MR. PRESTON GROSS

Graduate Admissions Specialist
Phone: 410-651-6507
Email: pvgross@umes.edu



DR. WELE ELANGWE

Director of Student Services
Phone: 410-651-8626
Email: welangwe@umes.edu



DR. KELSIE ENDICOTT

Graduate Writing Center
Coordinator
Phone: 410-621-2971
Email: kjendicott@umes.edu

GRADPULSE EDITORIAL TEAM



DR. WELE ELANGWE

Director of Graduate Student
Services
Editor-in-Chief



DR. KELSIE ENDICOTT

Graduate Writing Center
Coordinator
Editor



MS. UCHENNA NWONYE

Graduate Assistant
Reviewer

DIRECTORY

GRAD SCHOOL 410-651-6507

Program

Applied Computer Science (M.S.)
Director: Dr. Asad Azemi
Applied Computing and Engineering (Ph.D.)
Director: Dr. Yuanwei Jin
Career & Technology Education (PTE Licensure) (Certificate)
Director: Dr. Tyler Love
Career Technology Education (M.Ed.)
Director: Dr. Tyler Love
Chemistry (M.S.)
Director: Dr. Victoria Volkis
Counselor Education (M.Ed.)
Director: Dr. Cheryl Bowers
Criminology and Criminal Justice (M.S.)
Director: Dr. Kingsley Ejiogu
Cybersecurity Engineering Technology (M.S.)
Director: Dr. Derrek Dunn
Data Science and Analytics Engineering (M.S.)
Director: Dr. Derrek Dunn
Education Leadership (Ed.D.)
Director: Dr. Ernest England
Electrical and Mechatronics Engineering
Director: Dr. Yuanwei Jin
Food and Agricultural Sciences (M.S.)
Director: Dr. Stephan Tubene
Food and Agricultural Sciences (Ph.D.)
Director: Dr. Caleb Nindo
Global Humanitarian Disaster Assistance (Certificate)
Director: Dr. Simon Zebelo
Human Ecology (M.S.)
Director: Dr. Bridgett Clinton-Scott
Marine Estuarine Environmental Sciences (M.S.)
Director: Dr. Stephen Tomasetti
Marine Estuarine Environmental Sciences (Ph.D.)
Director: Dr. Stephen Tomasetti
Organizational Leadership (Ph.D.)
Director: Dr. Tao Gong
Pharmaceutical Sciences (M.S.)
Director: Dr. Patrice Jackson-Ayotunde
Pharmaceutical Sciences (Ph.D.)
Director: Dr. Patrice Jackson-Ayotunde
Physician Assistant Studies (M.M.S.-PAS)
Director: Dr. Nicole Wooten
Physical Therapy (D.P.T.)
Director: Dr. Michael Rabel
Quantitative Fisheries and Resource Economics (P.S.M.)
Director: Dr. Paulinus Chigbu
Rehabilitation Counseling (M.S.)
Director: Dr. Hector Velazquez
Rural Health Disparities and Social Inequities (Certificate)
Director: Dr. Miriam Purnell
Special Education (Certificate)
Director: Dr. Kimberly Poole-Sykes
Special Education (M.Ed.)
Director: Dr. Kimberly Poole-Sykes
Teaching (Master of Arts in Teaching)
Director: Dr. Kimberly Poole-Sykes
Toxicology (M.S.)
Director: Dr. Ali Ishaque
Toxicology (Ph.D.)
Director: Dr. Ali Ishaque
Work-Based Learning & Career Counseling (Certificate)
Director: Dr. Tyler Love

Phone

Phone: (410)-651-7268
Email: AAzemi@umes.edu
Phone: (410)-621-3410
Email: yjin@umes.edu
Phone: 410-727-4808 Ext 164
Email: tslove@umes.edu
Phone: 410-727-4808 Ext 164
Email: tslove@umes.edu
Phone: (410)-651-6030
Email: vvolkis@umes.edu
Phone: (410)-651-6265
Email: cdbowers@umes.edu
Phone: (410)-651-8914
Email: kejiogu@umes.edu
Phone: (336)-337-5068
Email: ddunn@umes.edu
Phone: (336)-337-5068
Email: ddunn@umes.edu
Phone: (410)-651-8465
Email: ESEngland@umes.edu
Phone: (410)-621-3410
Email: yjin@umes.edu
Phone: (410)-651-7577
Email: skubene@umes.edu
Phone: (410)-651-7963
Email: clinindo@umes.edu
Phone: (410)-651-6163
Email: sazebelo@umes.edu
Phone: (410)-651-8351
Email: beclinton@umes.edu
Phone: (410)-651-2200
Email: stjtomasetti@umes.edu
Phone: (410)-651-2200
Email: stjtomasetti@umes.edu
Phone: (410)-621-1473
Email: tgong@umes.edu
Phone: (410)-621-3044
Email: pljackson@umes.edu
Phone: (410)-621-3044
Email: pljackson@umes.edu
Phone: (410)-651-3032
Email: NKWooten@umes.edu
Phone: (410)-651-6310
Email: mcraebel@umes.edu
Phone: (410)-621-3034
Email: pchigbu@umes.edu
Phone: (410)-651-2200
Email: HVelazquezGonzalez@umes.edu
Phone: (410)-621-3777
Email: mcpurnell@umes.edu
Phone: (410)-651-6220
Email: kipoolestykes@umes.edu
Phone: (410)-651-6220
Email: kipoolestykes@umes.edu
Phone: (410)-651-6220
Email: kipoolestykes@umes.edu
Phone: (410)-651-2200
Email: abishaque@umes.edu
Phone: (410)-651-2200
Email: abishaque@umes.edu
Phone: 410-727-4808 Ext 164
Email: tslove@umes.edu

SPRING 2026 HIGHLIGHTS: SAVE THE DATES!

15TH ANNUAL RESEARCH SYMPOSIUM APRIL 16, 2026

Get ready for one of the most anticipated academic events of the year! The 15th Annual Regional Research Symposium will showcase innovative scholarship, creative inquiry, and interdisciplinary research from graduate and undergraduate scholars across the university!

FEATURED ACTIVITIES



Poster Presentations: Students and faculty researchers will display their work in an interactive poster session designed to spark dialogue, collaboration, and new ideas.



3-Minute Thesis (3MT®) Competition: Students will compete to present their research clearly and compellingly in just three minutes. A fast-paced, exciting event you won't want to miss!



Oral Presentations: Scholars will deliver formal presentations highlighting original research, methodologies, and emerging contributions across disciplines.

CALL FOR VOLUNTEERS: PLANNING COMMITTEE

We're seeking enthusiastic volunteers to serve on the 2026 Symposium Planning Committee. This is a great opportunity to:

- Support a major academic event
- Contribute to logistics and programming
- Build leadership and event-planning experience
- Work closely with faculty, staff, and fellow students

INTERESTED?

If you're interested in joining the team, please contact:

- **Dr. Wele Elangwe** – 410-651-8626
- **Mrs. Angela Young** - 410-651-7966
- **Uchenna Nwonye** – 410-621-3367

MORE DETAILS COMING SOON

Registration deadlines, judging opportunities, and full event schedules will be announced on the Graduate Studies website... Stay tuned!

UMES GRADUATE SCHOOL SPRING 2026 GRADUATION

FEBRUARY 4, 2026

- Add/Drop Ends; No "W" grade
- Last day of Residency Petition

FEBRUARY 6, 2026

- Withdrawal period begins: Receive "W" grade

APRIL 10, 2026

- Last Day to apply for Graduation

APRIL, 2026

- Cap and Gown Orders - Herff Jones

APRIL 21, 2026

- Last Day to Defend!
- ALL defenses MUST be announced at least 10 days prior to the defense date
- ALL defenses MUST be open to the public.

MAY 5, 2026

- Certification of Completion of Degree Form
- Fulfillment of Course requirements Form
- Report of Examining Committee Form
- Final Submission of Dissertation with all corrections by email/pdf to graduatestudies@umes.edu, cc.kjendicott@umes.edu

TWO WEEKS AFTER DEFENSE

- Submit your dissertation or thesis through ProQuest
- Submit Approval Sheet
- Complete the "[Survey of Earned Doctorates](#)"

WANT TO BE FEATURED IN THE SPRING EDITION OF THE GRADPULSE?

Share your academic milestone (e.g. graduation), research, creative work, or community project from October 2025 - January 2026.

Submit by Jan 25, 2026

<https://forms.gle/iUf5KpLqAVwm2ems6>

CONTACT US

☎ 410-651-6507 /7966 /8626

🌐 www.umes.edu/grad

✉ graduatestudies@umes.edu