QUILLEN COLLEGE of MEDICINE

EAST TENNESSEE STATE UNIVERSITY

Departments of Biomedical Sciences and Medical Education

June 2024

Newsletter

Message from the Chair

Dr. Krishna Singh, Ph.D., FAHA, FAPS, QDRF

Department of Biomedical Sciences

Highlights

Everyone,

The month of May brings excitement with commencement ceremonies. This year, we enjoyed seeing three of our students – Loren Peeters, Misty Owens, and Paige Shook – complete their graduation requirements. All three of them have chosen to continue their journey in academia. Dr. Peeters will join Vanderbilt University, Dr. Owens will join ETSU, and Dr. Shook will join Mayo Clinic (Arizona) for postdoctoral training.

Congratulations to faculty members who have secured new funding since the last update in December 2023. Dr. Xiaohui Wang has been awarded a new NIH RO1 grant with funding of $2.35 million. Drs. Aaron Polichnowski, Valentin Yakubenko, and Russ Brown received ETSU RFP awards. We also celebrate the faculty members who were nominated for, or honored with, the 2024 Caduceus and Scarlet Sash awards, as well as those recognized as String of Pearls Speakers.

We are delighted to add Mr. Gavin Skelton and Dr. Amy Gravitte to our team, taking on the roles of Financial Analyst and Research Assistant II, respectively. We are currently seeking a replacement for Abbigail Cornett (Research Assistant II) as she has chosen to pursue further academic endeavors in the Biomedical Science Graduate Program at Ohio State University, Columbus, OH. In addition, we are in the midst of another faculty search. The Faculty Search Committee, comprising Drs. Russ Brown (Chair), Jenny Hall, Aaron Polichnowski, Valentin Yakubenko, Qian Xie, Justin Gass, and Tammy Ozment, is diligently working on this task. I would like to express my gratitude to everyone for their service and active participation in all the staff and faculty searches. Your efforts and contributions are always appreciated.

Thank you for everything you do!

Krishna Singh

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Welcomes

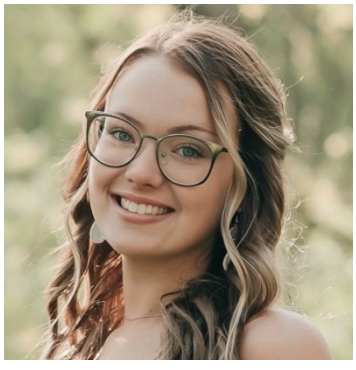
Mary Ellis Glymph, Director of Teaching and Innovation, DME

Mary Ellis Glymph is the director for Teaching and Learning Innovation for the Department of Medical Education. She has a bachelor's degree in English from Presbyterian College, a master's in English from the University of Tennessee, Knoxville, and is currently working on a doctoral degree in education at the University of South Carolina. She lives in Bristol, Virginia with her Siberian husky and enjoys reading, yoga and participating in local theatre in her spare time.

Tiffany Gasperson, Anatomy Lab Manager, DME

I was born, raised, and currently live in the small town of Fall Branch, TN. I joined the United States Army in 2008. I graduated from ETSU with a B.S. in psychology and a minor in criminal justice in 2020. I have been an employee with ETSU since 2017. My working background consists of current and past work with the William L. Jenkins Forensic Center and the Medical Examiner's Office of Hawkins County as a medicolegal death investigator. I have a passion for forensics and really enjoy focusing on blood spatter patterns and ballistics. When I am not working, I spend all of my time with my family, Jacob my husband, and our two children Isaac and Harper. My husband and I both share a passion for farming. We currently have a working farm, Blackberry Hill Farms, that takes up most of our spare time and then some. I LOVE COWS! I also enjoy playing the piano, watching the Investigation Discovery channel, deer hunting, turkey hunting (pretty much any kind of hunting), 4-wheeling, cooking and camping.

Kayla See, Coordinator, DME



I am Kayla See and graduated from Walters State with a focus in business management. I have two dogs, Trix and Sasha, and two cats, Luna, Mia. In my free time, I enjoy spending time with family, fishing and being outdoors.

Welcomes (cont.)

Gavin Skelton, Financial Analyst I, DBMS

I'm Gavin Skelton, I'm the new financial management analyst in the DBMS. I graduated from ETSU in 2019 with a bachelor's in human services. In my free time, I like to play D&D with friends, hike at Bays Mountain, and I'm a huge movie buff. I'm an easy-going person, so feel free to pop in my office (B209) and say hi if you're ever in Wing B! I'm excited to be a part of the DBMS, and I look forward to working with you all!

Dr. Amy Gravitte, Research Assistant II, DBMS

I graduated with my Ph.D. in biomedical sciences with a concentration in microbiology in 2021. My graduate mentor was Dr. Jennifer Hall and I studied the effects of female hormones on chlamydia infections. After graduation I worked with Dr. Kruppa for two years studying the fungal pathogen Candida auris. Now, I have taken the research assistant II role and I'm currently working with Dr. Xiaohui Wang.

Grant Funding

Principal Investigator: Dr. Xiaohui Wang
Agency: NIH R01
Amount: $2.35 Million
Title: Novel role of LSECs in hepatic immune and metabolic function during sepsis
Funding Period: 04/15/24-02/28/29
Project Narrative: Liver sinusoidal endothelial cells (LSECs) are crucial in maintaining hepatic immune and metabolic functions, yet their specific roles in bacterial infection and sepsis remains poorly understood. In addition, patients with nonalcoholic steatohepatitis (NASH) or cirrhosis are at increased risk of bacterial infections and subsequent sepsis. Our research shows that in these patients, severe capillarization of LSECs may contribute to observed hepatic immune and metabolic dysfunctions, increasing their susceptibility to infections. This study aims to elucidate the novel role of liver sinusoidal endothelial cells (LSECs) in regulating Kupffer cell zonation, enhancing bacterial clearance, and maintaining hepatic metabolic functions during sepsis, particularly in patients with NASH/ Cirrhosis. By elucidating these mechanisms, the findings could provide valuable insights into potential therapeutic targets, thereby improving outcomes of patients suffering from this severe condition.

Principal Investigator: Dr. Russ Brown
Agency: ETSU RFP
Amount: $20,000
Title: “Effects of nicotine vapor exposure in a heritable rodent model of psychosis.”
Funding Period: 2024-2025

Principal Investigator: Dr. Kelly Karpa
Agency: ETSU Student Activities Allocation Committee
Award: $1500.00
Title: To develop social activities and outreach activities jointly among MD, PT, OT, and Pharm students.
Funding Period: 2024-2025

Grant Funding (cont.)

Principal Investigator: Dr. Aaron Polichnowski
Co-Investigators: Rachel Grindstaff, a 3rd year Ph.D. student in Dr. Polichnowski's lab; Dr. George Youngberg, Department of Pathology; and Dr. Stacy Brown, College of Pharmacy
Agency: ETSU RFP
Amount: $20,000
Title: "Mechanisms of PFAS-induced Kidney Injury"
Funding Period: 2024-2025
Project Narrative: Per- and poly-fluoroalkyl substances (PFAS) are a large group of synthetic chemicals used in the production of numerous consumer products and are recognized as persistent organic pollutants. A growing body of epidemiological evidence indicates that PFAS are associated with chronic kidney disease and hypertension; however, the underlying mechanisms are poorly understood. The objective of this proposal is to examine the temporal evolution of PFAS-induced renal pathology and pathogenic signaling mechanisms in isolated proximal tubules using unbiased mass spectrometry/proteomic analyses.
Dr. Polichnowski also received a 2024 MBCF grant titled "PFAS-induced Proximal Tubule Injury" ($5,000). The grant will cover the costs of instrumentation usage within the MBCF to investigate indices of injury in urine samples and isolated proximal tubules of rats administered PFAS.

Principal Investigator: Dr. Valentin Yakubenko
Agency: ETSU RFP
Amount: $20,000
Title: "Exploring the role of integrin αDβ2 in neutrophil-mediated macrophage migration during inflammation."
Funding Period: 2024-2025

Publications

Owens MM, Dalal S, Radovic A, Fernandes L, Syed H, Herndon MK, Cooper C, **Singh K**, **Beaumont E**. Vagus nerve stimulation alleviates cardiac dysfunction and inflammatory markers during heart failure in rats. Autonomic Neuroscience: Basic and Clinical. 2024, Mar 4:253:103162.

Singh SK, Prislovsky A, Ngwa DN, Munkhsaikhan U, Abidi AH, Brand DD, **Agrawal A**. C-reactive protein lowers the serum level of IL-17, but not TNF-a, and decreases the incidence of collagen-induced arthritis in mice. Front. Immunol. 15:1385085, 2024.

Wang-Heaton H, Wingard MC, Dalal S, Shook PL, Connelly BA, Johnson P, Nichols PL, Singh M, **Singh K**. ATM deficiency differentially affects expression of proteins related to fatty acid oxidation and oxidative stress in a sex-specific manner in response to Western-type diet prior to and following myocardial infarction. Life Sci. 2024; 1;342:122541. doi: 10.1016/j.lfs.2024.122541.

Awujoola AO, Mokikan MT, Odebunmi OO, Mamudu HM, Stewart DW, Husari, G, **Singh K**, Grant C, Budoff M, Paul T. Factors associated with myocardial infarction in a rural population with peripheral arterial diseases. Angiology. 2024; doi: 10.1177/00033197241232608.

Jamerson L., **Bradshaw, P.** Slowing reproductive ageing by preserving BCAT-1. Nat Metab. 2024 Feb 28. doi: 10.1038/s42255-024-01009-8.

Lang HM, **Duffourc MM**, Bazyler CD, Ramsey MW,.Gentles JA.J Strength Cond Res. 2024 Feb 20. doi: 10.1519/JSC.0000000000004751. Online ahead of print.PMID: 38373069. The Relationship Between Cell-Free DNA and Resistance Training Volume Load - PubMed (nih.gov).

Flores EK, Dowling K, **Abercrombie C**, Wallace RL. Impact of interprofessional student teams at a remote area medical event in rural Appalachia. J Appalachian Health 2023; 5(2):66–84. DOI: https://doi.org/10.13023/jah.0502.06.

Keever KR, Kui Cui, Casteel JL, Singh S, Hoover DB, Williams DL, Pavlov VA, **Yakubenko VP**. Cholinergic signaling via the α7 nicotinic acetylcholine receptor regulates the migration of monocyte-derived macrophages during acute inflammation. Journal of Neuroinflammation, 2024 Jan 4;21(1):3. PMID: 38178134.

Mannon EC, Muller PR, Sun J, Bush WB, Coleman A, Ocasio H, **Polichnowski AJ**, Brands MW, O'Connor PM. NaHCO3 loading causes increased arterial pressure and kidney damage in rats with chronic kidney disease. Clinical Science 138(4):189-203, 2024.

Jia C*, Drew Gill W, Lovins, C, Brown RW, Hagg T. 2024. Astrocyte focal adhesion kinase reduces passive stress coping by inhibiting ciliary neurotrophic factor only in female mice. Neurobiology of Stress 30:100621, PMID 38516563.

Duesing P, Hameed U, Purushothaman I, **Karpa K**. Interprofessional Collaborative Practice Requirement Embedded in a Psychiatry Clerkship for Medical Students. Journal of Interprofessional Education & Practice. 2024; 35:100699 https://doi.org/10.1016/j.xjep.2024.100699

Brown C, Latimer E, Lehman E, **Karpa K**. Assessing the Effectiveness of Online Interprofessional Education Simulations: A Pre-Post Comparison of Student Learning. Interdisciplinary J Virtual Learning in Medical Sciences. 2024;15(2), Accepted April 16, 2024.

Book Chapters

Ryan Wilson and **Karpa KD**. Calcium Channel Blockers. Brody's Human Pharmacology, 7th edition. Elsevier, 2024.

Herrman F, Kocis PT, **Karpa KD**, and Vrana KE. Antithrombotic Medications. Brody's Human Pharmacology, 7th edition. Elsevier, 2024.

Presentations

Cross LB, Butler PA, **Abercrombie CL**, Williams A. Using Standardized Patients as Partners in Teaching Interprofessional Curricula. Poster. March 2024. National Academies of Practice Annual Meeting & Forum.

Abercrombie C, Hood M, Williams A. Interprofessional Engagement to Improve Clinical Collaboration. Poster. February 2024. Association of Continuing Education for Health Professionals Annual Conference.

Dinnes BE, Foster CR, **Singh, K**, Dalal S. Ataxia telangiectasia-mutated kinase deficiency induces cardiac dysfunction with increased myocyte apoptosis and hypertrophy with age. Experimental Biology (APS) meeting, Long Beach, CA, April 4-7, 2024 (poster).

Derek C, Brian W, Oliver J, Hagg T, **Jia C***, Inhibition of FAK promotes olfactory neurogenesis and function recovery following acute inflammation through CNTF. Association for chemoreception Sciences 2024 annual meeting, Bonita Springs, Florida.

Seminars

Dr. Nicole Lewis, Ph.D., Department of Medical Education, ETSU. Wait, what test am I supposed to use again? A refresher in biostatistics. January 23, 2024.

Craig Land, Department of Biomedical Sciences, ETSU. Advancing Borreliosis: The physiological and immunological response of the murine model during early Lyme disease. February 13, 2024.

Galen Huffcutt, Department of Biomedical Sciences, ETSU. Insomnia treatment drug Lemborexant rescues sleep dysfunction associated with methamphetamine vapor withdrawal. March 5, 2024.

Deepshila Gautam, Department of Biomedical Sciences, ETSU Exploring 40 Hz neuronal synchrony in different cortical regions: primary auditory and prefrontal cortices. March 19, 2024.

Akeemat Tijani, Department of Biomedical Sciences, ETSU. Overcoming the barrier to the clinical application of naloxone via the transdermal route: application of drug delivery technologies. April 2, 2024.

Bailey McGuffin, Department of Biomedical Sciences, ETSU. The role of cannabinoids in cognition, addiction, and behavior. April 9, 2024.

Britta Schwartz, Department of Biomedical Sciences, ETSU. The impact of sex in a comorbid model of posttraumatic stress disorder and alcohol use disorder. April 16, 2024.

Seminars (cont.)

Leah Jamerson, Department of Biomedical Sciences, ETSU. Decreasing NADPH levels may impair C. Elegans mitochondrial function during aging. April 23, 2024.

Morgan Callaghan, Department of Biomedical Sciences, ETSU. Cutibacterium acnes and the skin microenvironment: Optimizing a co-culture model to decipher atopic dermatitis. April 30, 2024.

Dr. Christian Lemon, Associate Professor, School of Biological Sciences, University of Oklahoma. A functional neural link between thermosensation and taste. April 29, 2024.

Dr. Jingru Sun, Associate Professor, Department of Translational Medicine and Physiology, Elson S. Floyd College of Medicine, Washington State University. Neuronal GPCR regulation of immunity in C. elegans. May 26, 2024.

Services Anniversaries

5 Years:
Dr. Chad Frasier - DBMS
Dr. James Sheffey - DME

10 Years:
Dr. Nicole Lewis - DME
Crystal Maupin - DBMS

15 Years:
Dr. Michelle Chandley - DBMS
Dr. Jennifer Hall - DBMS
Dr. Michael Kruppa - DBMS

25 Years:
Dr. Michelle Duffourc - DBMS

***45 Years:**
Dr. Richard Kostrzewa - DBMS
Dr. Paul Monaco - DME

Awards

2024 Caduceus Award Nominations and Awards to DBMS and DME Faculty and Staff

Award: M1 Outstanding Professor of the Year

Nominees:

- Dr. Robert Schoborg
- Dr. Antonio Rusinol
- Dr. Aaron Polichnowski
- Dr. Ed Mobley
- Dr. Doug Thewke

Award: M1 Outstanding Anatomy Professor of the Year

Nominees:

- Dr. Michelle Chandley
- Dr. Leon Dumas
- Dr. James Sheffey
- Dr. Thomas Kwasigroch - awardee

Awards (cont.)

Award: M1/M2 Outstanding College of Medicine Staff Award

Nominee:

- Rob Becker

Award: M2 Outstanding Course of the Year

Nominees:

- Brain, Body, and Behavior: Congratulations to Dr. Diego Rodriguez-Gil (director), Dr. Regenia Phillips-Campbell (co-director) and to all of the DBMS and DME faculty who taught in this course.
- Anatomy: Congratulations to all of the DBMS and DME faculty who taught in this program.
- Doctoring III: Congratulations to Dr. Patricia Amadio (director) and to all of the DBMS and DME faculty who taught in this course.
- IPE: Congratulations to all of the DBMS and DME faculty who taught in this program.
- Endocrinology and Reproduction: awardee. Congratulations to Dr. Tom Ecay (director) and to all of the DBMS and DME faculty who taught in this course.

Award: M2 Outstanding Professor of the Year

Nominees:

- Dr. Robert Schoborg
- Dr. Diego-Rodriguez Gil
- Dr. James Hayman
- Dr. Jennifer Hall
- Dr. Michelle Duffourc
- Dr. Thomas Ecay

2024 String of Pearls Speakers from the DME and DBMS

String of Pearls is the last official in-class activity that QCOM M4 students participate in before graduation. In this session, the M4 students invite 5-8 faculty to convey last minute "pearls" of wisdom to the class. It is a high honor from the graduating medical class to be chosen to do so. The following DME and DBMS members were chosen to be "String of Pearls" speakers by the QCOM graduating class of 2024:

- Dr. Rob Schoborg
- Dr. Tom Kwasigroch
- Dr. James Denham

2024 Graduation Awards and Honors to DBMS and DME Faculty and Staff

Every year, the QCOM graduating class also chooses faculty and staff members to honor at their graduation ceremony. The "Scarlet Sash" honor is awarded to those faculty and staff whom the graduating medical students consider to be the most influential mentors during their educational journey at QCOM. This distinction is one of the highest honors that the graduating medical class bestows upon faculty or staff members. The following DBMS and DME members were awarded the "Scarlet Sash" honor by the QCOM graduating class of 2024.

- Dr. Patricia Amadio
- Dr. Michelle Duffourc
- Dr. Tom Kwasigroch
- Dr. Aaron Polichnowski
- Dr. Antonio Rusinol
- Dr. Robert Schoborg

Awards (cont.)

In most college graduation ceremonies, the **mace bearer** leads the graduation procession. Although each university mace is designed to represent different aspects of the institution, the mace generally represents education and enlightenment. At QCOM, the mace bearer is selected by the graduating class and is an individual who is held in very high regard by the students. **Dr. Antonio Rusinol** was chosen to be the mace bearer by the QCOM graduating class of 2024.

Being chosen as one of two **faculty hooders** is the highest honor bestowed to a faculty member by the graduating class of medical students. **Dr. Robert Schoborg** was chosen as a hooder by the QCOM graduating class of 2024.

Please join me in congratulating the individual faculty and staff who were honored this year by our medical students. Additionally, I would like to take a moment to thank every DME and DBMS faculty and staff member who participates in and provides support for the QCOM medical education mission. You are all essential for the continued success of our medical education programs. Through your efforts, you have enormous positive impact on the health of people in our region, our nation and around the globe. Thank you all for your kindness, teamwork, expertise, and dedication to our college.

Congratulations to the following students who received awards at the 2024 Appalachian Student Research Forum!

Graduate Students

Jared Casteel (poster presentation)
Title: Inflammation-mediated oxidation of polyunsaturated fatty acids generates a new adhesive substrate for integrin αMβ2- and αDβ2-dependent macrophage migration and retention
Advisor: Dr. Valentin Yakubenko, Department of Biomedical Sciences

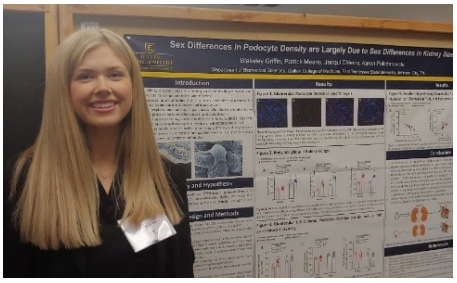
Anthony Cuozzo (poster presentation)
Title: Positive allosteric modulation of the mGlu5 attenuates enhanced D2 signaling and nicotine conditioned place preference in a heritable model of drug abuse vulnerability in psychosis
Advisor: Dr. Russell Brown, Department of Biomedical Sciences

Bailey McGuffin (poster presentation)
Title: MGlu5 modulation reduces alcohol self-administration in an animal model of THC and alcohol co-use
Advisor: Dr. Justin Gass, Department of Biomedical Sciences

Britta Schwartz (poster presentation)
Title: Sex Differences in Avoidance Behavior and Neuroinflammation in a Comorbid Model of Posttraumatic Stress Disorder and Alcohol Use Disorder
Advisor: Dr. Justin Gass, Department of Biomedical Sciences

Medical Student

Blakeley Griffin, a 4th year Quillen medical student who worked in **Dr. Polichnowski's** lab, received a poster award at the 2024 Appalachian Student Research Forum for her research presentation titled "Sex Differences in Podocyte Density are Largely Due to Sex Differences in Kidney Size".



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Biomedical Science Graduate Program Graduates

Misty Owens

Optimization of Vagus Nerve Stimulation (VNS) and the Use of Cervical VNS as a Treatment for Heart Failure with Reduced Ejection Fraction

Advisor: Dr. Eric Beaumont, Department of Biomedical Sciences

Concentration: Neuroscience

Loren Peters

Validation of a novel heritable rodent model of drug abuse vulnerability in psychosis: Implications for investigation of therapeutic targets

Advisor: Dr. Russell Brown, Department of Biomedical Sciences

Concentration: Neuroscience

Paige Shook

Exogenous ubiquitin: role in myocardial ischemia/reperfusion injury, and macrophage phenotype and function

Advisor: Dr. Krishna Singh, Department of Biomedical Sciences

Concentration: Cardiovascular Sciences

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Medical Student News

DME celebrated the success of two new Pathway Programs for MS1 students on May 2, 2024:

Clinical Navigation Pathway: Effective student engagement in the Clinical Navigation Pathway will improve patient experiences with the health care system, support person-centered care, improve patient outcomes, improve health equity, and promote cost-effectiveness. In this Pathway, students will learn: to navigate the clinical site in which they are placed, learning about the roles and responsibilities of other team members at the site as well as learn to navigate the larger health care system through referrals and transitions in care.

Patient-Student Partnership Pathway is developing in-depth, longitudinal relationships with a patient. This is accomplished through regular meetings with a single patient over the course of a year in which specific "assignments" are fulfilled and deliverables (e.g., verbal patient presentations, written reflections) are completed. Students apply skills that enable them to effectively take a patient history, aid their patient in establishing SMART goals, teach their patients strategies to maintain health and wellness (e.g., via home safety assessments, medication review, healthy eating, preventative/evidence-based medicine measures, etc). Students develop therapeutic relationships by demonstrating humility and sensitivity, learn about care provided by other professions (e.g., OT, pharmacy, dietitians, etc), and will learn how their patient's personal preferences, needs and values have been (or not been) met by the health care system. Students will learn from patients as much as patients learn from them. Students experience how delivery of person-centered care relies on patients having good care experiences, being involved in their care, and having a feeling of wellness and well-being

Other News

Dr. Kelly Karpa received a certificate for having a British J Pharmacology paper that ranked in the top 10% of all papers downloaded in 2022, Wiley. March 14, 2024.

Dr. Russ Brown participated in the Graduate School baseball weekend and cheered on the Bucs Baseball Team!