DEPT. OF TOXICOLOGY AND CANCER BIOLOGY NEWSLETTER

Volume 6, Issue 2

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NEWSLETTER ITEMS

Want to include something in the next newsletter? Send your stuff to Cherish Oliver at ToxAndCancerBio@uky.edu

New Grants:

Dr. Luksana Chaiswing:

National Cancer Institute, "Targeting Mitochondria in Prostate Cancer with Novel A Gold (Au)-based Therapeutic Compound to Improve Radiation Treatment." Total funding: $38,500 for 1 year.

Our preliminary data show that mitochondrial biogenesis, regulated by transcription factor A, mitochondrial (TFAM), is upregulated in recurrent prostate cancer (PCa), and radioresistant PCa cells exhibit increased mitochondrial metabolism and mtROS, indicating that mitochondrial redox regulation contributes to radioresistance. Our research aims to evaluate novel gold compound AuPhos89 in two specific areas: Aim 1 assesses its ability to enhance RT efficacy in radioresistant PCa models by overloading mitochondrial ROS to sensitize cancer cells to radiation; Aim 2 evaluates whether AuPhos89 can prevent PCa invasion and bone resorption by inhibiting TFAM-driven mitochondrial biogenesis in PCa and suppressing osteoclast differentiation through the RANKL pathway. If successful, this project could establish gold-based compounds as novel mCRPC therapies that integrate well with existing treatments, potentially reducing recurrence and skeletal-related complications.

Dr. Qing Wang:

American Cancer Society, "Specific inhibition of mTORC2 activity by a novel peptide in Rictor-elevated lung cancer." Total funding: $40,000 for 1 year.

The major goals of the study are to elucidate the mechanism by which the Rictor-binding domain (RBD) peptide suppresses migration in Rictor-elevated non-small cell lung cancer (NSCLC) by downregulating PFKFB3-mediated glycolytic ATP production and actin reorganization, and to validate that mTORC2-specific inhibition by RBD peptide preferentially suppresses invasion and metastasis in Rictor-elevated NSCLC. In addition, the accomplishment of the proposed studies will not only provide a strong rationale for Rictor-elevated lung cancer therapeutics via RBD peptide, a mTORC2-specific inhibitor, but also lay a solid foundation for applying extramural funding in the future.

Featured Grant:

Dr. Zhiguo Li:

Department of Defense, "Targeting MNK/GRP78 Pathway to Disrupt Proteostasis Rewiring in Castration-Resistant Prostate Cancer." Total funding: $1,602,137 for 3 years.

Prostate cancer (PCa) is a prevalent disease among men, with castration-resistant prostate cancer (CRPC) posing a significant challenge due to limited treatment options and poor survival rates. Current therapies, such as androgen signaling inhibitors (ASIs), provide only modest survival benefits, typically extending life by a few months. Therefore, there is an urgent need for innovative therapeutic strategies that can effectively combat CRPC. Therapeutic interventions targeting the androgen receptor (AR) disrupt protein homeostasis (proteostasis), leading to proteotoxic stress and cell death. However, residual drug-tolerant cells must overcome imbalances in the proteostasis network to survive. The mechanisms behind the reprogramming of the proteostasis network that allow these cells to bypass AR pathway inhibition and acquire resistance to AR-targeted therapies remain largely unknown. This research focuses on the MNK/GRP78 signaling pathway. Residual cells that survive androgen signaling inhibitor (ASI) treatment restore the GRP78/IRE1 and GRP78/ATF6 branches. This restoration is mediated by MNK-mediated phosphorylation of GRP78, which reestablishes proteostasis and promotes ASI resistance. The central hypothesis is that targeting this pathway could disrupt the proteostasis network in castration-resistant prostate cancer (CRPC) cells, potentially overcoming resistance to ASI therapy.

Recently Accepted or Published Manuscripts:

Dr. Xiaoqi Liu:

Wang, X., Liu, J., Mao, F., Kong, Y., Zhang, Q., Li, C., He, D., Wang, C., Zhang, Y., Wang, R., Ellingson, S. R., Wei, Q., Li, Z. and **Liu, X.** (2025) Artesunate enhances the efficacy of enzalutamide in advanced prostate cancer. *J. Biol. Chem.* doi: 10.1016/j.jbc.2025.108458. PMID: 40154619.

Liu, J., Wang, X., He, D., Maasoumyhaghighi, H., Nouri, M., Peng, J., Wu, S., Wang, J., Brooks, N., Pegg, N., Frese, K., Li, Z., Wu, M., Rao, X., Wang, R., and **Liu, X.** (2025) Therapeutic Targeting of the p300/CBP Bromodomain Enhances the Efficacy of Immune Checkpoint Blockade Therapy. *Oncogene.* https://doi.org/10.1038/s41388-025-03417-w.

Dr. Changhai Tian:

Qingxuan Li, Neha Dhyani, Lie Gao, Tara L. Rudebush, Irving H. Zucker, and **Changhai Tian**[#]. Cardiac Injury Potentially Contributes to Neuroinflammation via Extracellular Vesicles. Abstract WMP13 was published on *Stroke*, 2025, Volume 56, Number Suppl_1. https://doi.org/10.1161/str.56.suppl_1.WMP13. (#Corresponding author).

Tian, CH, Chen, L and Hu, GK. Chapter 22: Chromatin isolation by RNA purification (ChIRP) and its applications, Editor(s): Trygve Tollefsbol, In Translational Epigenetics, Epigenetics Methods, Academic Press, 2025 (2nd edition); Volume 19, Pages 507-521, ISSN 25425358, ISBN 9780128194140, https://doi.org/10.1016/B978-0-12-819414-0.00025-2.

Qingxuan Li, Ramzi H. Hamdalla, Neha Dhyani, Lijun Sun, Lie Gao, Tara L. Rudebush, Irving H. Zucker, and **Changhai Tian**[#]. Cardiac injury regulates neuroinflammation through extracellular vesicle-mediated heart-brain crosstalk. *J Am Coll Cardiol Basic Trans Science*. 2025 (In press)

(#Corresponding author).

Dr. Nathan Vanderford:

Bardhan R, Hudson-Rose L, Burke H and **Vanderford NL**. Multilevel Mentorship Prepares Youth for the Oncology Workforce in Appalachian Kentucky. *Health Promotion Practice*. Published ahead of print.

Hudson-Rose L, Burke H, Thornsbury O, Jackson K, Spradlin R and **Vanderford NL**. Cancer Advocacy Empowers Appalachian Kentucky Youth. *Health Promotion Practice*. Published ahead of print.

Faculty Awards and Recognition:

Dr. Nathan Vanderford:

2025 University of Kentucky Center for Clinical and Translational Science Mentor Award

2025 University of Kentucky Advising Network Ken Freedman Outstanding Faculty Advisor Award

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Faculty Activity:

Dr. Xiaoqi Liu:

Dr. Xiaoqi Liu travelled to Chicago to attend ASBMB annual meeting from March 11-14, 2025. Dr. Liu co-chaired a session and gave an oral presentation entitled “Targeting Plk1 to enhance the efficacy of immunotherapy in prostate cancer.”

Dr. Changhai Tian:

2025 IBS Course Directors and Teachers Meeting with IBS External Review Committee, March 11, 2025.

2025 Judge for the 16th Annual COM Trainee Research Day (postdoc poster session), University of Kentucky, March 24, 2025.

Serve as an Ad hoc reviewer of 2025 Transformational Projects (TPA) Award Brain Sciences Peer Review Committee, May 8, 2025.

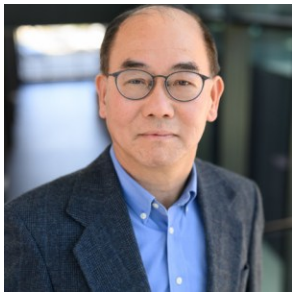
2025 Judge for the 15th Annual Markey Cancer Center Research Day, University of Kentucky, May 13, 2025.

Tian, CH. Extracellular vesicle-mediated Heart-Brain Axis Communication Following Myocardial Injury. Department of Toxicology and Cancer Biology Seminar Series, University of Kentucky, May 05, 2025.

Dr. Nathan Vanderford:

4/2025 Member, National Institutes of Health, National Institute of Allergy and Infectious Diseases R25 Research Education Program Special Emphasis Study Section (2025/05 ZAI1 SPJ-D (M4) 1)

Dr. Jinming Yang:



Dr. J. Yang will on the NIH BCO Study Section on June 25-26, 2025.

Dr. Hsin-Sheng Yang:

Awarded rank of full professor within the College of Medicine.

Lab Activity:

Dr. Christine Brainson:

Christian Gosser has been awarded the T32 Fellowship!

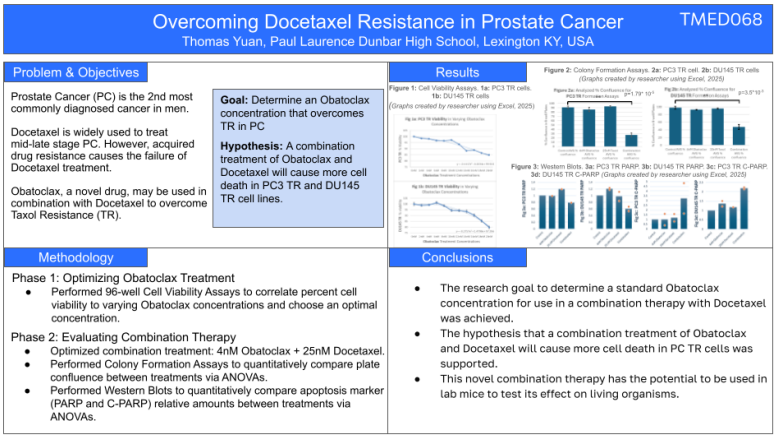
Dr. Zhiguo Li:

Lab members Amos Akinyemi, Md Rakibul Alam, and Mithu Howlader attended the AACR conference in Chicago, IL.

Thomas Yuan, a high school Magnet program student from Paul Laurence Dunbar High School, completed an internship in Dr. Li's lab. Lab members mentored the student over the past 6 months. Per Amos Akinyemi, "As my personal belief goes—sometimes, it's not just about the awards we receive, but about the meaningful impact we make on the younger generation. Together with Rakibul and Mithu, we had the privilege of mentoring Thomas. Through our guidance, he secured 1st place locally in a poster presentation competition, which qualified him for the international level, where he proudly achieved 4th place. Despite our demanding schedules as PhD candidates, we were able to invest in his growth and success. It's a testament to the supportive and enriching environment within the Department of Toxicology and Cancer Biology."

Paul Laurence Dunbar student Thomas Yuan

Yuan placed 1st in Cellular and Molecular Biology and placed 3rd for the overall fair at the Kentucky Science and Engineering Fair. He placed 4th at the International Science and Engineering Fair in Translational Medical Science.



Overcoming Docetaxel Resistance in Prostate Cancer TMED068

Thomas Yuan, Paul Laurence Dunbar High School, Lexington KY, USA

Problem & Objectives

Prostate Cancer (PC) is the 2nd most commonly diagnosed cancer in men.

Docetaxel is widely used to treat mid-late stage PC. However, acquired drug resistance causes the failure of Docetaxel treatment.

Obatoclax, a novel drug, may be used in combination with Docetaxel to overcome Taxol Resistance (TR).

Goal: Determine an Obatoclax concentration that overcomes TR in PC

Hypothesis: A combination treatment of Obatoclax and Docetaxel will cause more cell death in PC3 TR and DU145 TR cell lines.

Results

Figure 1: Cell Viability Assays. 1a: PC3 TR cells. 1b: DU145 TR cells (Graphs created by researcher using Excel, 2025)

Figure 2: Colony Formation Assays. 2a: PC3 TR cell. 2b: DU145 TR cells (Graphs created by researcher using Excel, 2025)

Figure 3: Western Blots. 3a: PC3 TR PARP. 3b: DU145 TR PARP. 3c: PC3 TR C-PARP. 3d: DU145 TR C-PARP (Graphs created by researcher using Excel, 2025)

Methodology

Phase 1: Optimizing Obatoclax Treatment
- Performed 96-well Cell Viability Assays to correlate percent cell viability to varying Obatoclax concentrations and choose an optimal concentration.

Phase 2: Evaluating Combination Therapy
- Optimized combination treatment: 4nM Obatoclax + 25nM Docetaxel.
- Performed Colony Formation Assays to quantitatively compare plate confluence between treatments via ANOVAs.
- Performed Western Blots to quantitatively compare apoptosis marker (PARP and C-PARP) relative amounts between treatments via ANOVAs.

Conclusions
- The research goal to determine a standard Obatoclax concentration for use in a combination therapy with Docetaxel was achieved.
- The hypothesis that a combination treatment of Obatoclax and Docetaxel will cause more cell death in PC TR cells was supported.
- This novel combination therapy has the potential to be used in lab mice to test its effect on living organisms.

Yuan's prize-winning poster from the International Science and Engineering Fair.

Dr. Xiaoqi Liu:

Dr. Meng Wu, a Scientist of Dr. Liu's lab attended ASBMB meeting as he was recently elected to join the editorial board of J of Biological Chemistry.

Dr. Hsin-Sheng Yang:

Lab member, Elham Zokaei, attended AACR in Chicago, IL.

Dr. Jinming Yang:

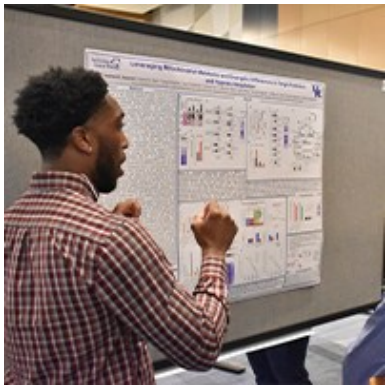
While attending AACR, J. Yang lab members met Dr. William Hait.

Dr. Hait is a prominent figure in cancer research and currently serves as the Chief Scientific Advisor to AACR. It was a great moment for the students, especially because their PI, Dr. Jin-Ming Yang, previously worked under Dr. Hait's supervision and helped establish the Rutgers Cancer Institute alongside him.

Dr. Hait's leadership at Johnson & Johnson was instrumental in launching over 20 breakthrough therapies, including treatments like DARZALEX® and ZYTIGA®, significantly advancing patient care worldwide.

L to R: Felix Oyelami, Dr. William Hait, Andrew Shinkle

Students Excel at Markey Cancer Center Research Day:



Kahleel Guerrier presents at Markey Cancer Center Research Day

The University of Kentucky Markey Cancer Center's 15th annual Research Day on May 13 brought together researchers, clinicians, staff and students to celebrate the center's scientific accomplishments and spotlight ongoing cancer research across UK.

The day-long event featured oral presentations, poster sessions and two distinguished guest speakers who addressed key developments in cancer research and community engagement. More than 100 posters were presented, spanning all areas of cancer research — from prevention and control to basic science, clinical care and survivorship.

Students placing in the poster competition included:

Students and Postdoctoral Fellows, Basic Science

- 1st place and overall winner: Dave-Preston Esoe, "Targeting Mesenchymal Cells with Epigenetic Therapy in Lung Cancer and Lung Disease"

2nd place (tie):

- Christian Gosser, "Targeting EZH2 to Overcome Osimertinib Resistant Non-Small Cell Lung Cancer"
- Amos Akinyemi, "Targeting ER Stress Sensors to Overcome Enzalutamide Resistance in Prostate Cancer"

L to R: Kahleel Guerrier (Chaiswing), Amos Akinyemi (Li), Dave-Preston Esoe (Brainson), Christian Gosser (Brainson)

Students and Postdoctoral Fellows, Clinical/Population Science

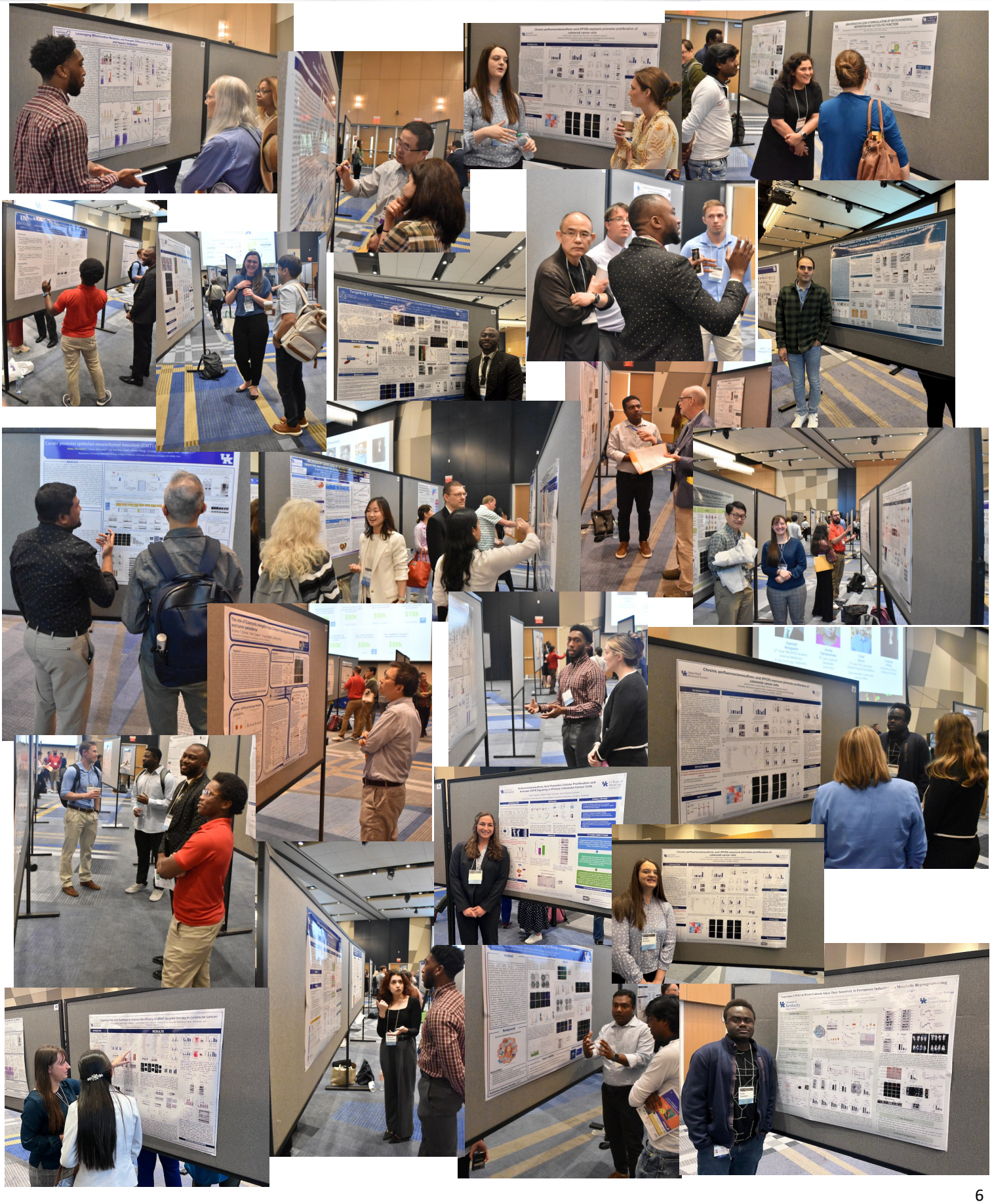
- 1st place: Kahleel Guerrier, "Leveraging Mitochondrial Metabolic and Energetic Differences to Target Radiation and Hypoxic Adaptation"

J. Yang is Invited Speaker for MCC Research Day!

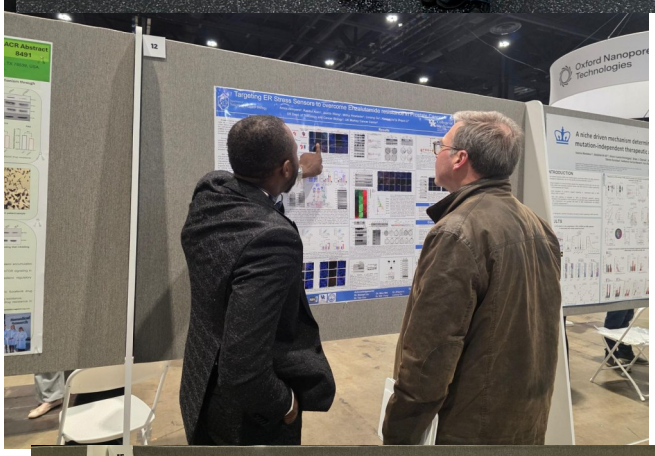
Dr. JinMing Yang presented recently published study findings in an invited talk at the MCC Research Day.

Jin-Ming Yang, M.D., Ph.D., professor in the UK College of Medicine's Department of Toxicology and Cancer Biology, presented his research on NAC1, a protein his lab has identified as a promising cancer treatment target.

In his presentation, Yang described how NAC1 functions as a key regulator in multiple cancer types, particularly in aggressive triple-negative breast cancer. His work, recently published in Molecular Cancer, shows that inhibiting NAC1 could reduce cancer metastasis and enhance the effectiveness of immunotherapy treatments.




UNIFYING
CANCER SCIENCE AND MEDICINE:
A CONTINUUM OF INNOVATION FOR IMPACT
AACR American Association for Cancer Research
ANNUAL MEETING
25 CHICAGO
#AACR25



AACR


UNIFYING
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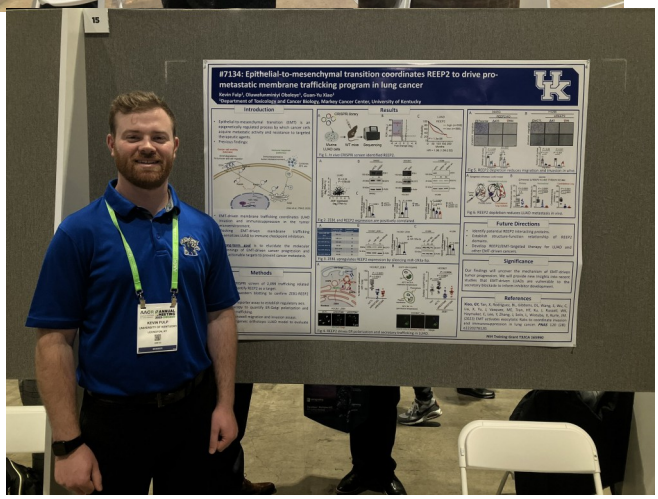
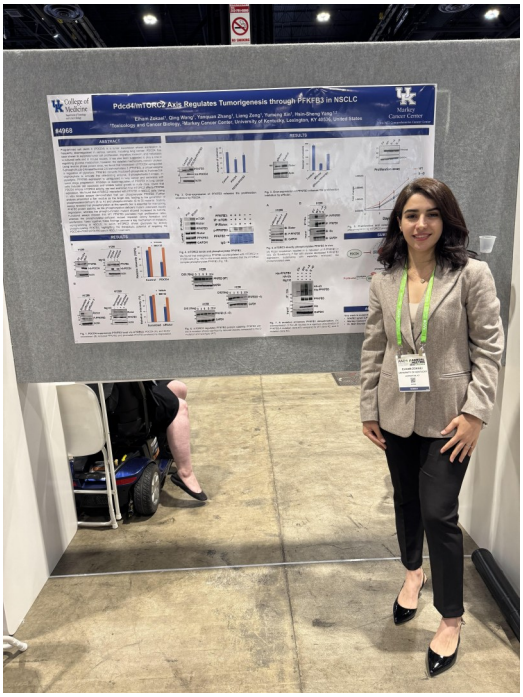
A CONTINUUM OF INNOVATION FOR IMPACT
#AACR25


#7134: Epithelial-to-mesenchymal transition coordinates REEP2 to drive pro-metastatic membrane trafficking program in lung cancer


PdcsdimTORC2 Axis Regulates Tumorigenesis through PFKFB3 in NSCLC


UNIFYING
CANCER SCIENCE AND MEDICINE:
A CONTINUUM OF INNOVATION FOR IMPACT
AACR American Association for Cancer Research
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#AACR25

Congratulations, Dr. Wang!!

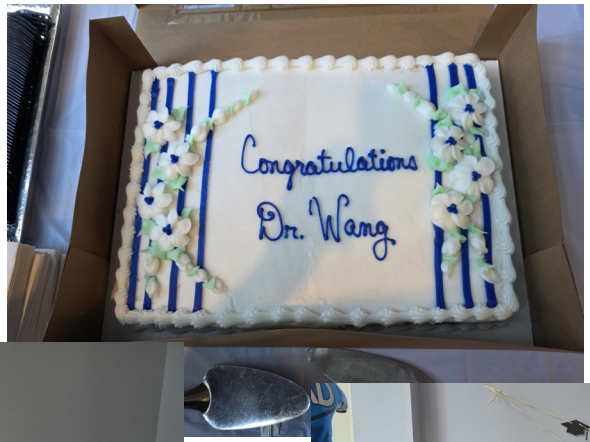
Xinyi Wang has successfully defended her thesis, “Aretesunate Enhances the Efficacy of Enzalutamide in Advanced Prostate Cancer, and PLK1 Attenuates Colon Inflammation and Tumorigenesis.” The defense was scheduled for April 23rd and was well attended by students and faculty.

Xinyi worked with both Dr. Liu’s and Dr. Li’s labs. After graduation, Xinyi will remain in Dr. Liu’s lab as a postdoctoral scholar.

A celebration was held for Xinyi where cake and refreshments were served!

We wish Xinyi all the best as she starts her new journey!

L to R: Dr. Xiaoqi Liu, Dr. Xinyi Wang, Dr. Zhiguo Li



Back Row L to R: Dr. Xiongjian Rao, Dr. Jinghui Liu, Mohammad Esfini-Farahani, Dr. Zhiguo Li
Front Row L to R: Dr. Pingli Mo, Dr. Xiaoqi Liu, Dr. Xinyi Wang, Dr. Jia Peng, Fatemeh Seilani, Mansoureh Nouri, Hamed Maasoumyhaghighi, Sai Wu

L to R: Amos Akinyemi, Mithu Howlader, Md. Rakibul Alam, Dr. Xinyi Wang, Dr. Zhiguo Li

Congratulations, Dr. Sarah Alqithami !!

Sarah Alqithami successfully defended her thesis, "NF-κB-Mediated Oxidative Stress Drives Cigarette Smoke-Induced EMT in Human Bronchial Cells," on April 24th, 2025. Sarah has worked in Dr. David Orren's lab during her tenure in the department.

A party was held for Sarah on the day of her defense to celebrate her achievements. By request, her cake was customized to reflect her years of research which focused on tobacco smoke.

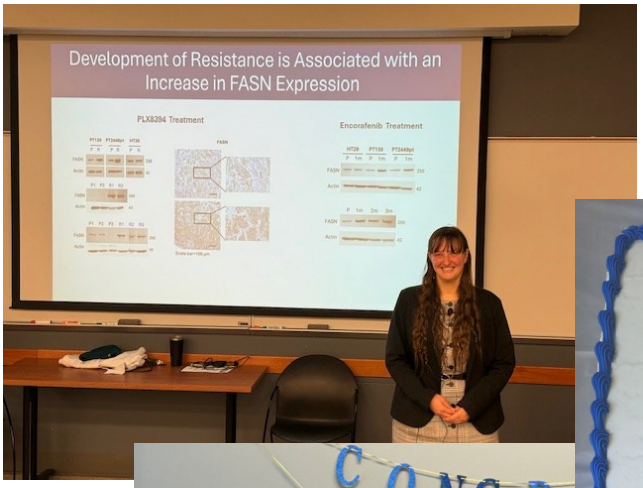
After graduation, Sarah will be returning to Saudi Arabia where she will teach at a university! We wish Dr. Alqithami all the best in her future endeavors!

Congratulations, Dr. Geisen!

Mariah Geisen has successfully defended her thesis, "Developing Novel Therapeutic Strategies for mCRC with a $BRAF^{V600E}$ Mutation." Both Mariah's defense seminar and celebration were held on May 9th, 2025 coinciding with the College of Medicine commencement.

Mariah has worked diligently in Dr. Zaytseva's lab throughout her studies and will remain in the lab until her final day, June 30th. Mariah has accepted a position with MedPace as a Clinical Research Assistant and will be based out of Cincinnati.

During her tenure within the department, Mariah served as vice president for the DTCB Student Forum. She helped organize activities for fellow students including cookouts, ice skating, and volunteer opportunities for fellow graduate students.



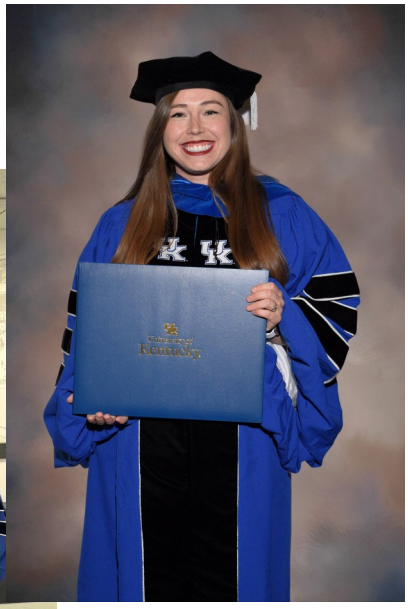
We wish Mariah all the best in her new adventures!

Dr. Mariah Geisen and Meagan Geisen

Dr. Yekaterina Zaytseva and Dr. Mariah Geisen

L to R: Dr. Erika Elias Ferreira, Jerika Durham, Fake Mariah (Meagan), Dr. Zaytseva, Dr. Mariah Geisen, Emily Ferguson, Dr. Josie Weber-Tessman, Ila Iniyavan


UK25



Congratulations to all of our MS in Forensic Toxicology and Analytical Genetics students on their recent graduation!

Graduated Students:

Aislin Blair

Gabrielle Boyd

Bethany Flannery

Jooli Hansen

Kelli Harpe

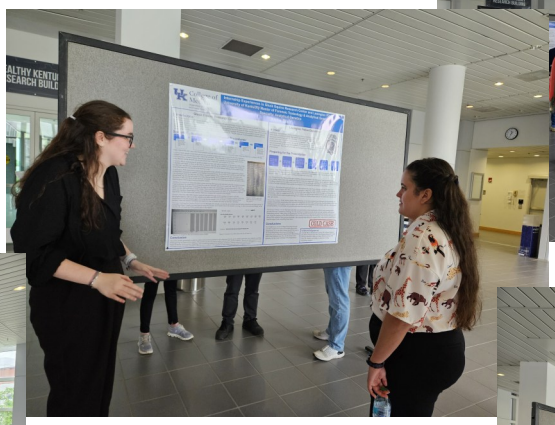
Megan Hayden

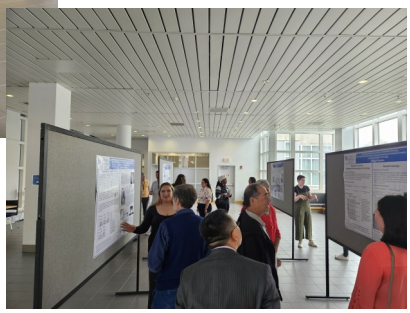
Konner Schieman

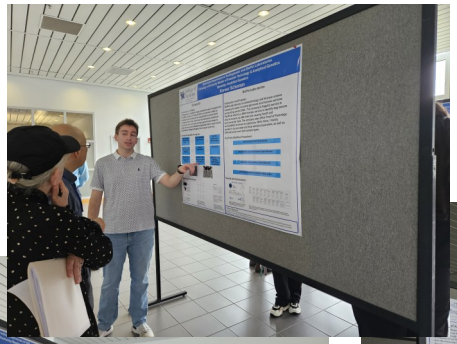
Back Row (L to R): Kelli Harpe, Konner Schieman, Aislin Blair

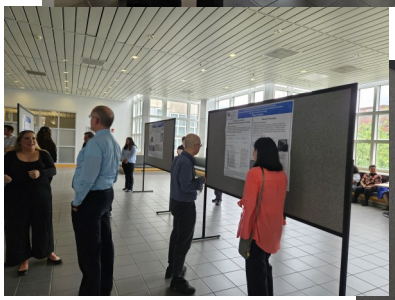
Front Row (L to R): Megan Hayden, Bethany Flannery, Jooli Hansen, Gabrielle Boyd

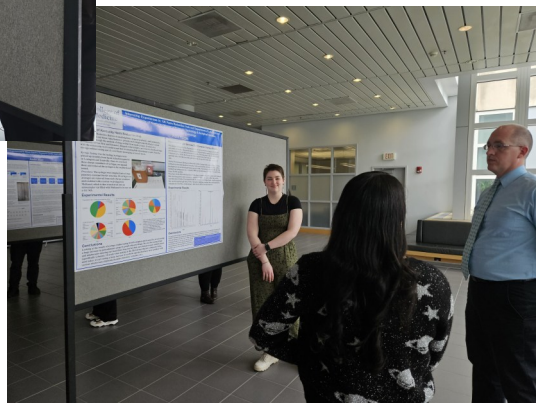
The 2025 Forensic Poster Session held on May 8, 2025 in the BBSRB Atrium was a huge success! Please see photos from the event below.











Four MS in Forensic Toxicology and Analytical Genetic second year students begin internships this summer!

Farzam Alavi:

California State University, Northridge (CSUN): Dr. Mariano Loza-Coll's Lab

Ryan Asmann:

UKY College of Public Health with Dr. Rachel Vickers-Smith

Zoe Krispin:

KY Energy & Environment Cabinet

Lexi Ward:

Integrated DX

Incoming Forensic Students Awarded Lyman T. Johnson Graduate Fellowship for 2025-2026 school year!

Lyman T. Johnson was the first Black student to enroll as a graduate student at the University of Kentucky in 1949 after a successful legal challenge. He embodied a courage in pursuit of scholarship and development that continues to inspire all who work and study at UK. In his honor, the Lyman T. Johnson (LTJ) Fellowship is available for students entering one of the many programs at the University of Kentucky Graduate School. Applicants must describe, in an essay, how their pursuit of graduate education reflects the values of the fellowship's namesake. The application must be accompanied by the support of the program's Director of Graduate Studies. Awards are highly competitive, as we receive many more applications than can be funded each year.

Recipients include:

- Daniel Daly
- Laura Hoskins

Forensics Students Complete Internship with Lexington Police Department!

In photo (L to R): Bethany Flannery, Aislin Blair

SAVE THE DATE!!

The Forensics Retreat will be held on August 22, 2025 from 9:00 am to 1:00 PM

Student Forum Activity:

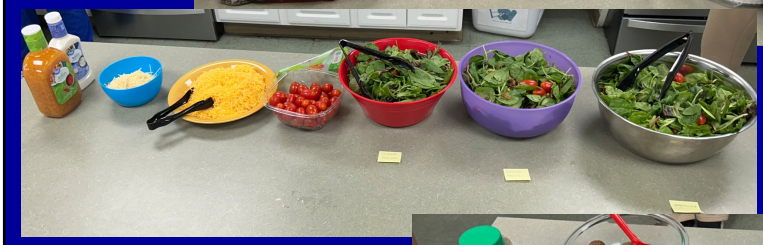
L to R: Jerika Durham and Yinping Jiang

DTCB Student Forum cooks up delicious dinner for ACS Hope Lodge!

Students from the DTCB Student Forum volunteered at the ACS Hope Lodge, cooking dinner on May 15th. A spaghetti dinner, complete with sides and dessert was prepared to feed 40 family members currently housed at the ACS Hope Lodge.

The event was a huge success!

L to R: Niyi Obaleye, Felix Oyelami, Kevin Fulp, Yinping Jiang, Mariah Geisen, Amos Akinyemi, Jerika Durham



Niyi Obaleye

Spring 2025 Semester: DTCB Monday Seminars
12:00-1:00 PM
MN 463

August 25th	Dee Mazzetti and Noe Tirado-Muniz, UK
September 8th	Sara Macias Palacio, UK
September 15th	Maria Nur, UK
September 22nd	Avery Childress, UK
September 29th	Hai Wang, Roswell Park CCC
October 6th	Ling Cai, Duke University
October 13th	Hao Chang, U of Wisconsin at Madison
October 20th	Jason Liu, UTHSC at San Antonio
November 3rd	Kevin L. Fulp, UK
November 10th	Jinpeng Liu, UK
November 17th	Derek Allison, UK
November 24th	Oluwafunminiyi E. Obaleye, UK
December 1st	Samuel Awuah, UK
December 8th	Sheng Tong, UK

College of Medicine
Department of Toxicology and Cancer Biology

Fall 2025 Semester: DTCB Faculty Grant Talk Series

2:00 PM—3:00 PM

HKRB 410

Sept 26 —	Dr. Eunus Ali
Oct 10 —	Dr. Mary Mohrin
Oct 24 —	Dr. Kate Zaytseva
Nov 14 —	Dr. Zhiguo Li

Fall 2025 Semester: DTCB Trainee Talk Series
2:00 PM—3:00 PM
MN 463

Sept 19 — Mansoureh Nouri (Liu) & Min Zhang (Liu)

Oct 3 — Liang Zeng (HS Yang) & Elham Zokaei (HS Yang)

Oct 17 — Kahleel Guerrier (Chaiswing) & Felix Oyelami (J Yang)

Nov 21 — Andrew Shinkle (J Yang) & Cheng Zhang (Fong)

SUPPORT THE DEPARTMENT

Gifts to the department will be directed toward emerging needs and opportunities for our students, faculty research support, and unrestricted support for the department.

Click here to learn more and donate.

Thank you for your support!