

DEPT. OF TOXICOLOGY AND CANCER BIOLOGY NEWSLETTER

Volume 7, Issue 3

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SUPPORT THE DEPARTMENT

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New Grants (New grants are shared once the department receives PADR 1 stating the account has been created):



Xia Liu (PI in grant below):

NCI R01 CA311275, "Systemic Crosstalk Between Tumor Cells and Neutrophils in Triple-Negative Breast Cancer". Total funding: \$2,004,482 for 5 years. Triple-negative breast cancer (TNBC) is an aggressive breast cancer subtype with a high risk of metastasis and limited treatment options. Our research investigates how TNBC tumors reprogram the bone marrow to produce pro-tumor neutrophils that promote cancer progression, metastasis, and therapy resistance. We identified p38δ as a key mediator of this process and found that targeting p38δ can reduce the production of these harmful neutrophils and suppress tumor growth and metastasis. This project will define the underlying mechanisms and evaluate the therapeutic potential and clinical relevance of targeting p38δ and tumor-driven emergency granulopoiesis. Ultimately, our work may provide a new strategy to disrupt tumor-induced systemic immune changes and improve treatment for patients with aggressive TNBC.



Teresa Fan (PI in grant below) & Richard Higashi (co-I in grant below):

NCI R21 CA307890, "Single Cell-Resolution Imaging of Drug Resistance via Toxic Metal Pre-exposure in Lung Patient Tumor Microenvironment". Total funding: \$395,973 for 2 years. Toxic metal pre-exposure can be an important but unexplored resistance mechanism for cancer therapy such as platinum (Pt)-based therapy, particularly for toxic metal-polluted regions such as the US Appalachia. This urgent and unmet need for improving patient care can be best addressed by developing a tool for in situ single cell-resolution imaging of common toxic metals such as chromium (Cr)/lead (Pb) and Pt drug metal in juxtaposition to tumor and drug resistance-promoting markers in the tumor microenvironment of Pt-resistant patient tissues. A successful outcome will reveal a new drug resistance mechanism for cancer therapy that contributes to Appalachian health disparity.

Teresa Fan & Yekaterina Zaytseva (co-Is in grant below):

NCI R01 CA296401, "Rewired Lipid Metabolism Upon Spermine Synthesis Inhibition In Colorectal Cancer Tumorigenesis". Total funding \$1,750,000 for 5 years.

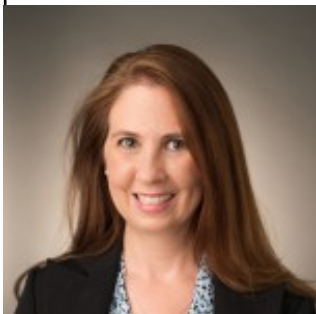
Richard Higashi (co-I in grant below):

NIDDK R01 DK148764, "Target PAQR4-Ceramide-GPNMB Pathway in MASH". Total funding: \$2,858,468 for 4 years. MASLD is a growing public health crisis, projected to affect 121.9 million people in the U.S. by 2050, with its severe form, MASH, driving fibrosis, cirrhosis, and hepatocellular carcinoma amid a lack of reliable biomarkers and limited therapies. Aberrant ceramide levels, a lipotoxic sphingolipid class, are closely linked to MASLD and MASH; our published and unpublished data indicate that PAQR4 promotes ceramide buildup, and activates the ceramide responsive effector GPNMB, leading to hepatic metabolic dysfunction and liver injury. The goal of this project is to define how the PAQR4-ceramide-GPNMB axis drives MASH and liver fibrosis, providing novel mechanistical insights and therapeutic opportunities for MASH and related fibrosis.

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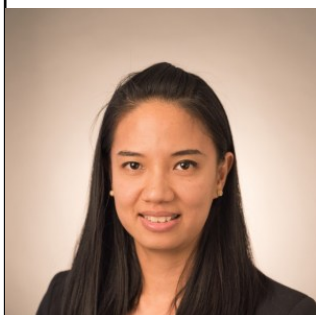
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New Grants (continued) (New grants are shared once the department receives PADR 1 stating the account has been created):



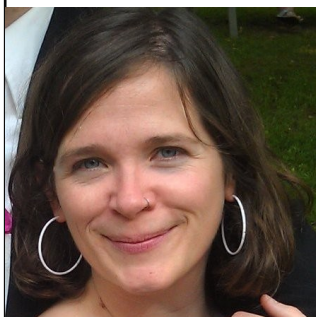
Christine Brainson (PI in grant below):

National Cancer Institute, “CCSG Pilot: COE: Understanding How to Implement Methionine Restriction to Improve Lung Cancer Treatments”. Total funding: \$76,500 for 1 year.



Luksana Chaiswing (PI in grant below):

National Cancer Institute, “CCSG Pilot: Radiation-Derived Extracellular Vesicles Promote Prostate Cancer Colonization in Bone Through Activation of the mtROS–RANKL–TFAM Axis”. Total funding: \$76,500 for 1 year. This work will define a previously unrecognized mechanism by which radiation therapy may systemically influence prostate cancer metastasis through EV-mediated mitochondrial signaling.



Mary Mohrin (PI in grant below):

Leukemia Research Foundation Inc, “A Nucleolar Stress Response Axis: Using SIRT7 To Predict & Potentiate Menin Inhibitors In Npm1-Mutated AML”. Total funding: \$149,976 for 2 years. Dr. Mohrin’s laboratory is developing new therapeutic strategies for NPM1-mutated acute myeloid leukemia (AML), a common and aggressive subtype that can develop resistance to recently approved menin inhibitors. This work will investigate whether the nucleolar regulator SIRT7 can serve as a biomarker of treatment response and if activating SIRT7-dependent stress pathways alongside menin inhibition can more effectively eliminate leukemia cells and prevent relapse.



Amrita Machwe and David Orren (co-Is in grant below):

National Cancer Institute, “Correlates and Transitions in Nicotine Pouch Use and Biomarker Validation Among Rural Adults: Appalachian Kentucky”. Total funding: \$399,864 for 1 year. The CASEL grant examines urinary biomarkers in human subjects to assess tobacco products use in the APPALTRUST cohorts. Drs. Machwe and Orren are affiliate members of APPALTRUST, the Tobacco Center of Regulatory Science here at UK.

Recently Accepted or Published Manuscripts:

Xiaoqi Liu:

1. Zhang, M. and **Liu, X.** (2026) Metabolic plasticity and enzalutamide resistance: emerging roles of PGK1 in prostate cancer. *Endocrinology*, May 26; 167(7):bqag063. doi: 10.1210/endocr/bqag063. PMID: 42178481. PMCID: PMC13234611.
2. Seilani, F., Peng, J., Wu, M., Farahani, M. E., Wang, X., Akinyemi, A. O. and **Liu, X.** (2026) BRN2 in Lineage Plasticity: A Prostate Cancer-Focused Perspective. *Endocrinology*, Sep 3; 167(10):bqag102. doi: 10.1210/endocr/bqag102. PMID: 42687120.
3. Nouri, M., Maasoumyhaghighi, H., **Liu, X.**, and Liu, J. (2026) HOXB13 as a lineage-restricted chromatin regulator linking androgen signaling, epigenetic remodeling, metabolic reprogramming, and kinase signaling in prostate cancer progression. *Serican Journal of Medicine*, 3(3), 25715. <https://doi.org/10.17161/sjm.v3i3.25715>.
4. Rao, X., Liu, J., Allison, D.B., Harrison, D.A., Fong, K.W., Wu, Y., He, D., Peng, J., Li, Z., Wang, C., Sturgill, J.L., Sen, P., and Liu, X. (2026) mTORC1-dependent regulation of the CCL24-CCR3 axis controls granuloma formation and maintenance in sarcoidosis. *Molecular and Cellular Biology*, 1–22. <https://doi.org/10.1080/10985549.2026.2680144>.

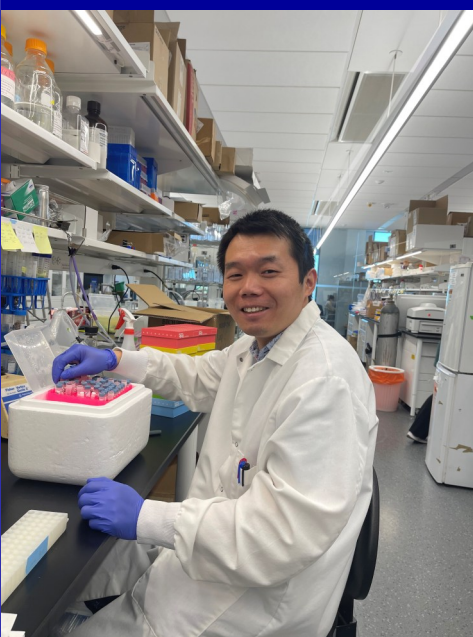
Center for Environmental and Systems Biochemistry (CESB):

N. Rashid, M. Otunla, N. Hasan, M. Hodges, H. Qaissi, T. S. Faniyan, P. R. Clement, **P. Lin, M. M. Y. Kaddah, T.A. Cassel**, D. Morgan, K. Rahmouni, K. H. Chhabra (2026). Renal glycosuria triggers a coordinated mannose and glutamine metabolic program to maintain glucose homeostasis. *Cell Reports* **45**, 117804

Qing Wang and Hsin-Sheng Yang :

Qing Wang, Yumeng Xin, Elham Zokaei, Liang Zeng, Dava Piecoro, Min Chen, Yanquan Zhang, Katie S. Yang, Chi Wang, Xiaoqi Liu, **Hsin-Sheng Yang**. Pdc4–Rictor interaction suppresses mTORC2–PFKFB3 axis and tumorigenesis in NSCLC, *Neoplasia* **80** (2026) 101354.

Featured Publication:



Dr. Xiongjian Rao (Scientist II in Dr. Xiaoqi Liu's Lab) Publication in *Proceedings of the National Academy of Sciences (PNAS)*

Rao, X., Allison, D.B., Flight, R.M., Lin, P., He, D., Li, Z., Zhang, Y., Wang, R., Li, C., Wang, J., Wang, X., Peng, J., Fong, K.W., Shao, Q., Wang, C., Ali, E.S., Moseley, H.N., and **Liu, X.** (2026) PLK1-mediated phosphorylation of PHGDH reprograms serine metabolism in advanced prostate cancer. *Proc. Natl. Acad. Sci. USA*, 123:31, e2618349123. doi:10.1073/pnas.2618349123. <https://doi.org/10.1073/pnas.2618349123>.

Abstract: Metabolic reprogramming is one of the hallmarks of cancer, yet how tumors fully exploit dysregulated metabolism is still an enigma. In this study, Dr. Rao and his colleagues found that PLK1 could divert serine metabolism from de novo synthesis to exogenous uptake by regulating phosphoglycerate dehydrogenase (PHGDH), the first rate-limiting enzyme of de novo serine biosynthesis. They show that PLK1 phosphorylation of PHGDH leads to its degradation, thus reducing de novo serine biosynthesis. As a compensatory response, cells with elevated PLK1 levels significantly increase the uptake of serine to produce more

sphingolipids, which are pivotal metabolites for cancer cell growth. The findings reveal how cancer cells orchestrate macromolecules like glucose, amino acids, and lipids to benefit cancer growth. This insight may provide guidance on targeting de novo serine biosynthesis, serine uptake, or sphingolipid metabolism to treat advanced prostate cancer.

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Faculty Activity:

Teresa Fan:

Study Section: EU Pathfinder grant proposals July 2026.

Xiaoqi Liu:

1. Seminar Presentation: The Coriell Institute for Medical Research, Camden, NJ 08103. "Moving PLK1 Beyond Mitosis". June 17, 2026.
2. Seminar Presentation: University of Wisconsin - Madison, Department of Dermatology, Madison, WI 53715. "Moving PLK1 Beyond Mitosis". Aug 3, 2026.
3. Seminar Presentation: Louisiana State University, Department of Pharmacology, Biochemistry, and Experimental Therapeutics, New Orleans, LA 70112. "Moving PLK1 Beyond Mitosis". Aug 19, 2026.
4. Seminar Presentation: University of Toledo, Department of Cell and Cancer Biology, Toledo, OH 43614. "Moving PLK1 Beyond Mitosis". Sep 3, 2026.

Tadahide Izumi:

1. NIH Review: NCI ZRG1 TCO-T Radiation Therapeutics (R01). July 17, 2026.
2. NIH Review: NIH/DOD reviews "Uniformed Services University's Armed Forces Radiobiology Research Program Grant Applications", AFRRI. July 29, 2026.

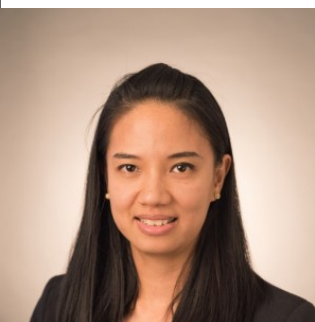
Luksana Chaiswing:

Oral presentation at the KY INBRE Annual Research Conference (ARC26), Hyatt Regency in Louisville, KY, USA. "Radiation-induced glioblastoma extracellular vesicles promote cognitive dysfunction and NFkB-dependent microglial neurotoxicity". Sep 11-12, 2026.



Dr. Luksana Chaiswing presenting

Faculty Promotion:



Luksana Chaiswing:

Was promoted to Associate Professor with Tenure. July 1, 2026.

Congratulations!

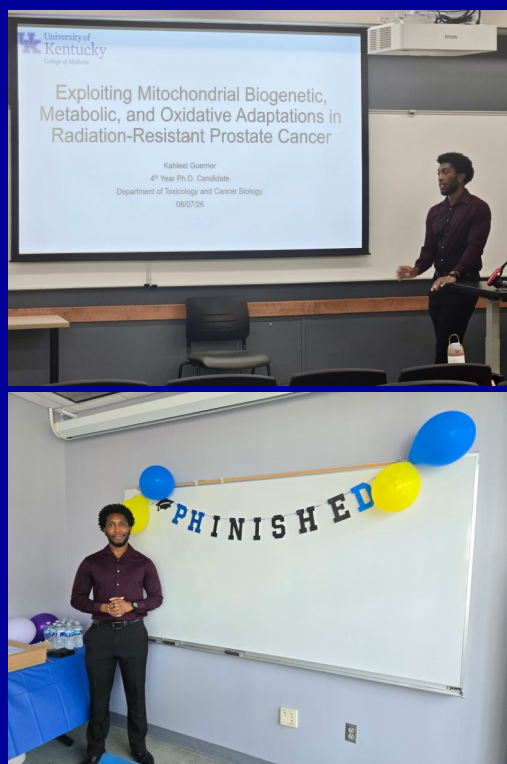
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Congratulations!

Dr. Kahleel Guerrier successfully defended his dissertation in August 2026. Congrats to him and his mentor Dr. Luksana Chaiswing, and his other committee members Drs. Xiaoqi Liu, Teresa Fan, Tadahide Izumi, and Tianyan Gao!

Dr. Guerrier is now working as a postdoctoral researcher in Dr. David Yu's lab at Emory University School of Medicine.



L to R: Dr. Kahleel Guerrier, Dr. Luksana Chaiswing



L to R: FangFang Xu, Dr. Kahleel Guerrier, Sophia Roth, Dr. Luksana Chaiswing

Congratulations to the PhD student who recently passed their qualifying exams!

L to R: Botao Zhang, Yumeng Xin, Fang Lu, Yindan Lin, Qingxuan Li, Xiangzhen 'Wayne' Wei. Yinping Jiang not pictured.

Congratulations!



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Welcome New Lab Member:



Dr. Hanling Gong received her medical degree and completed clinical training in the Department of Obstetrics and Gynecology in China. She later transitioned from clinical medicine to biomedical research and received her Ph.D. in Cell and Molecular Biology from the University of Texas at Dallas in 2026. During her research training, she gained experience in both cancer biology and microbiology.

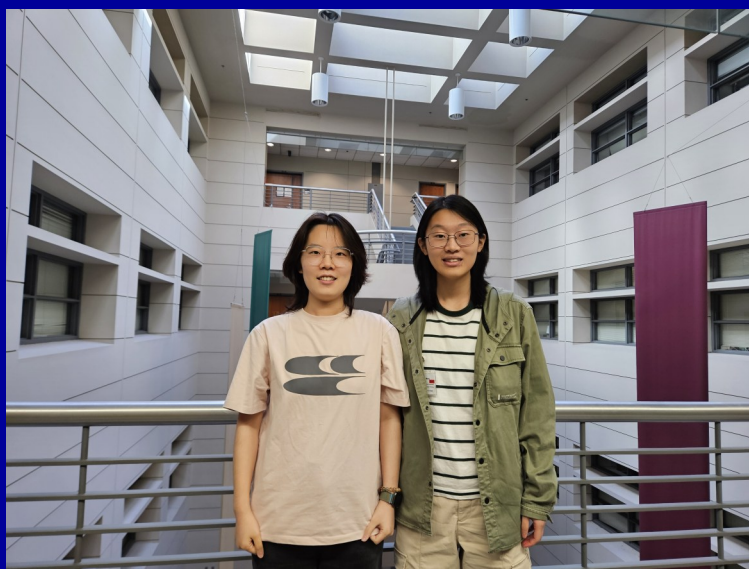
Hanling joined the Xiao Lab at the University of Kentucky as a postdoctoral researcher in Fall 2026. Her current research focuses on understanding the molecular mechanisms underlying cancer progression and metastasis.

Outside of the lab, Hanling enjoys watching movies, reading, getting her hands dirty with yard work, and traveling to experience new cultures—and, of course, good food along the way.

Welcome to Our New PhD Students!

New PhD Students:

L to R: Dingye Zhang and Xueqing Wang



Welcome to Our New MS Forensics Students!

L to R: Dejuante Davenport, Matthew Hargittai, Nathan Bearden, Ally Palumbo, Mackenna Harper, and Kailey Stafford.

Savannah Allen not pictured.



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DTCB Forensic Student Orientation

The DTCB Forensic Student Orientation was held on Friday, August 21st, 2026 in the Healthy Kentucky Research Building. A welcome for the first year students was given and then a welcome back for the second year students who gave talks about their summer internships.

Thank you to everyone who attended!



Katie Riley presenting on her internship with University of Kentucky Genetic Testing at Gluck



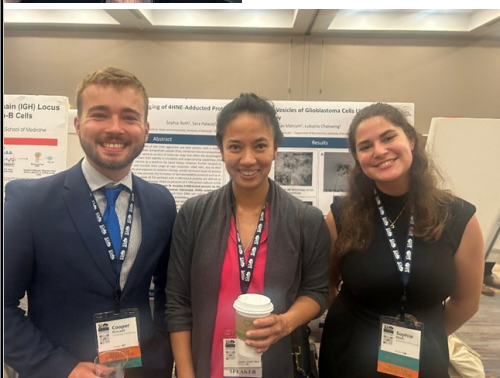
Abby Noren presenting on her internship with University of Kentucky Harm Reduction Hub

Student Activity:



Kailey Stafford:

Kailey Stafford, a MS in Forensic Toxicology and Analytical Genetics student, has been awarded a Lyman T. Johnson Fellowship for the 2026-2027 academic year from the Graduate School. Kailey received an academic year (Fall-Spring) stipend of \$10,000, plus a graduate tuition scholarship.



Sophia Roth:

Sophia Roth, 2026 OBE fellowship, poster presentation "Imaging of 4-HNE-Adducted Proteins in Extracellular Vesicles of Glioblastoma Cells". KY INBRE ARC26 conference, Hyatt Regency in Louisville, KY, USA. Sep 11-12, 2026.

Cooper Kincaid:

Cooper Kincaid, ACTION program student, poster presentation "Impact of Glioblastoma-Derived RedoxEVs on Neuroinflammatory Biomarkers in Mice". KY INBRE ARC26 conference, Hyatt Regency in Louisville, KY, USA. Sep 11-12, 2026.

L to R: Cooper Kincaid, Dr. Luksana Chaiswing, Sophia Roth

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Forensic Alumni Spotlight:

Aj McCondichie, a recent graduate of the MS Forensic Toxicology and Analytical Genetics program

The Department of Toxicology & Cancer Biology is proud to highlight Aj McCondichie, a recent graduate of the MS in Forensic Toxicology and Analytical Genetics program. Following graduation, Aj was hired as a genomics technician at the University of Chicago Medicine's Cytogenetic Laboratory.

Reflecting on his journey, Aj shared how his academic coursework and an internship opportunity directly shaped his career trajectory:

"My interest in cytogenetics came from a lecture Dr. Orren gave that included the Philadelphia translocation, leading me to choose UChicago Medicine's Cytogenetic lab as an internship site. While there, I had the opportunity to see cytogenetics from accessioning to analysis. I also had the opportunity to learn karyotyping, ISCN nomenclature, and report writing. I am looking to get ASCP certified in cytogenetics soon and possibly obtain a PhD in genetics to do what the directors at the lab do."



Student Forum Events:

The Student Forum continues to coordinate activities for all students to participate in! Keep an eye on your email for future activities and meetings.

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Fall 2026 Semester: DTCB Monday Seminars

12:00-1:00 PM

MN 463

Aug 31, 2026: Cheng Zhang, PhD Candidate
(Dr. Fong)

Sept 14, 2026: Dr. Tanya Stoyanova, UCLA
(Dr. Izumi)

Sept 21, 2026: Mansoureh Nouri, PhD Candidate
(Dr. Xiaoqi Liu)

Sept 28, 2026: Christian Gosser, PhD Candidate
(Dr. Brainson)

Oct 5, 2026: Elham Zokaei, PhD Candidate
(Dr. Xiaoqi Liu)

Oct 12, 2026: Dr. Jiaoti Huang, Duke University
(Dr. Fong)

Oct 19, 2026: Dr. Li Xin, University of Washington
(Dr. Li)

Nov 02, 2026: Rakibul Alam, PhD Candidate
(Dr. Li)

Nov 9, 2026: Dr. Ann Stowe, University of Kentucky
(Dr. Tian)

Nov 16, 2026: Andrew Shinkle and Meng Wu
(Dr. Li)

Nov 23, 2026: Mithu Howlader and Liang Zeng
(Dr. Li)

Nov 30, 2026: Dr. Xu Xiao, University of Kentucky
(Dr. Li)

Dec 7, 2026: Botao Zhang and Xiangzhen Wei
(Dr. Li)

Dec 14, 2026: Yindan Lin and Qingxuan Li
(Dr. Li)

Baby Watch 2026

Dr. Xiongjian 'James' Rao, Scientist II in Dr. Xiaoqi Liu's lab, and his wife recently welcomed twins- a boy and a girl, Peter and Mary Rao born on June 10, 2026.

In a creative celebration of a milestone year, the twins' names are inspired by Dr. Rao's exceptional research accomplishments in 2026. Their son Peter is named after PNAS (Proceedings of the National Academy of Sciences) and their daughter Mary is named after MCB (Molecular and Cellular Biology), marking the two prestigious, peer-reviewed journals in which Dr. Rao published papers this year.

Congratulations Rao family!



L to R: Mary and Peter Rao
Photo taken at half a month old.

NEWSLETTER ITEMS

Want to include something in the next newsletter?

Send your stuff to:

ToxAndCancerBio@uky.edu

