DEPT. OF TOXICOLOGY AND CANCER BIOLOGY NEWSLETTER

Volume 5, Issue 2

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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.

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Thank you for your support!

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



Dr. Guan-Yu Xiao (PI in grant below):

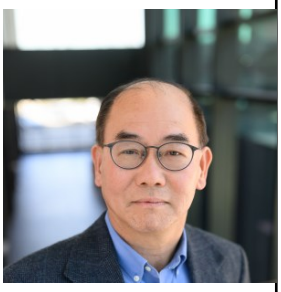
National Cancer Institute, "A Pro-Metastatic Secretory Program Activated by Epithelial-to-Mesenchymal Transition." Total funding: $224,101 for 3 years. The goal of this grant is to determine the functions of Rab6A machinery in cancer progression.



Dr. Jin-Ming Yang (PI in grant below):

National Cancer Institute, "Novel Strategy to Augmenting Immunotherapy Against Melanoma." Total funding: $392,252 for 2 years.

Featured Grant



Dr. Jin-Ming Yang (PI in grant below):

National Institute of Health, "Integrative Targeted Therapy for Melanoma." Total funding: $3,011,387 for 5 years.

Dr. Jin-Ming Yang's project entitled "Integrative Targeted Therapy for Melanoma" was recently funded by NIH (R01CA 282254). This project aims to define eukaryotic elongation factor-2 kinase (eEF-2K) as a novel and effective immune-modulatory target. The studies by Dr. Yang's lab strongly suggest that eEF-2K is an as-yet-unappreciated but critical regulator of antitumor immunity and that integrative targeting of this kinase may beneficially maximize the potency of immunotherapeutic intervention against melanoma. The central hypothesis is that eEF-2K modulates antitumor immunity via its regulatory roles in both tumor cells and tumor-reactive immune cells, and integrative targeting of eEF-2K could be exploited as an innovative therapeutic strategy for treatment of melanoma. Through comprehensive cellular, molecular, and pre-clinical studies, this project will pursue the following aims: (1) Determine the role and in-depth mechanism of eEF-2K in immune evasion; (2) Define the role of eEF-2K as a regulator of tumor-reactive immune cells; (3) Evaluate the antitumor efficacy of the eEF-2K-based and integrative targeted therapy. This research is innovative and significant because successful completion of this project would not only reveal eEF-2K as a novel and effective immuno-modulatory target for overcoming tumor immune-resistance as well as regulating immune cell functions, but also provide new therapeutic opportunities to substantially improve immunotherapy for advanced treatment-refractory melanoma through the eEF-2K-based integrative-targeted approach.

Recently Accepted or Published Manuscripts:

Dr. Xiaoqi Liu:

Kong, Y., Li, C., Liu, J., Wu, S., Zhang, M., Allison, D.B., Hassan, F., He, D., Wang, X., Mao, F., Zhang, Q., Zhang, Y., Li, Z., Wang, C., and **Liu, X.** (2024) Single-cell analysis characterizes PLK1 as a catalyst of an immunosuppressive tumor microenvironment in LUAD. *PLOS Genetics,* 20(6): e1011309. https://doi.org/10.1371/journal.pgen.1011309.

Dr. Yekaterina Zaytseva:

Tessmann JW, Deng P, Durham, Li C, Banerjee M, Wang Q, Goettl RA, He D, Wang C, Lee YY, Evers BM, Hennig BM, and Zaytseva YY. Perfluorooctanesulfonic acid exposure leads to downregulation of 3-hydroxy-3-methylglutaryl-CoA synthase 2 expression and upregulation of markers associated with intestinal carcinogenesis in mouse intestinal tissues. *Chemosphere*, doi.org/10.1016/j.chemosphere.2024.142332

Drury J, Geisen M, Tessmann J, Rychahou P, Kelson CO, He D, Wang C, Evers BM, and Zaytseva YY**.** Overexpression of Fatty Acid Synthase upregulates Glutamine--Fructose-6-Phosphate Transaminase 1 and increases O-GlcNAc protein glycosylation to promote colorectal cancer growth. *Jnt J Mol Sci.* 2024 Apr 30;25(9):4883. doi: 10.3390/ijms25094883.PMID: 38732103

Kelson CO, Zaytseva YY. Altered lipid metabolism in APC-driven colorectal cancer: the potential for therapeutic intervention. Front Oncol. 2024 Mar 25;14:1343061. doi: 10.3389/fonc.2024.1343061. eCollection 2024. PMID: 38590663

Center for Environmental and Systems Biochemistry (Drs. Lane, Fan and Higashi):

Lin, P., Sledziona, J; Akkaya-Colak, K.B.; Mihaylova, M.M.; Lane, A.N*. (2024) Determination of fatty acid uptake and desaturase activity in mammalian cells by NMR-based stable isotope tracing. Anal. Chim. Acta 1303: 2342511

Fan, T. W-M.*, Higashi, R.M., Lane, A.N. (2024) Metabolic reprogramming in human cancer patients and patient-derived models. CSH Perspectives accepted

P. Lin, A.N. Lane* and T. W-M. Fan (2024) NMR-based stable isotope tracing of cancer metabolism. Methods in Molecular Biology in press

C. J. Kinslow, M. Bousamra II, Y. Cai, J. Yan, P. K. Lorkiewicz, A. Al-Attar, J. Tan, R. M. Higashi, A. N. Lane,* T. W-M. Fan* (2024) Stable isotope-resolved metabolomics analyses of metabolic phenotypes reveal variable glutamine metabolism in different patient-derived models of non-small cell lung cancer from a single patient. Metabolomics in press DOI : 10.1007/s11306-024-02126-x

Dr. Yekaterina Zaytseva Selected as New Director of Graduate Studies for Research Students!

After careful consideration, the ad hoc committee for the selection of the Director of Graduate Studies (DGS) for DTCB has reached a decision. We received applications from several highly accomplished colleagues, and the committee, consisting of Dr. Beth Garvy (the senior associate dean for biomedical education), Dr. Nicole McCoin (vice dean for faculty affairs and development), Dr. Christine Brainson, and Dr. Luksana Chaiswing, convened to thoroughly evaluate all candidates.



We are delighted to announce that Dr. Yekaterina Zaytseva has been unanimously selected to serve as our next DGS for a three-year term.

Effective from July 1, 2024, to June 30, 2025, Dr. Zaytseva will assume the role of Associate DGS, collaborating closely with Dr. Isabel Mellon to ensure a seamless transition.

From July 1, 2025, to June 30, 2028, Dr. Zaytseva will serve as the DGS.

Please join us in congratulating Dr. Zaytseva on her appointment and in extending our support as she assumes these important responsibilities.

Faculty Activity:

Dr. Christine Brainson:

Dr. Brainson served on American Cancer Society, DOD Lung Cancer Research Program, and NCI SPORE grant review panels. She also gave seminars at University of Florida, Uniformed Services University of the Health Sciences, and University of West Virginia, and joined the editorial board of Carcinogenesis.

Dr. Eva Goellner:

Dr. Goellner gave a selected oral presentation at the 25th Midwest DNA Repair Symposium in Louisville, Ky!

"Enhancing Immunotherapy by Modulating MLH1 Phosphorylation with ABL Kinase Inhibitors."

Dr. Jin-Ming Yang:

Member, National Institutes of Health/ZRG1 BTC-M (02)M Study section (2024)

Center for Environmental and Systems Biochemistry (Drs. Fan, Higashi, and Lane):

T. W-M. Fan EU Innovations April 2024 (Study Section)

Oral Presentations:

T. W-M. Fan *Exploring human tumor metabolism in situ and in preclinical models using Stable Isotope Resolved Metabolomics (SIRM).* Cold Spring Harbor Metabolism Workshop, NY June 2024

T. W-M. Fan *Introduction to NMR for SIRM.* Cold Spring Harbor Metabolism Workshop, NY June 2024

T. W-M. Fan *How is patient breast cancer tissue metabolism reprogrammed?* Breast Cancer Symposium UKy, June 14, 2024.

Poster Presentations:

P. Lin, **R.M. Higashi, T. W-M. Fan and A.N. Lane.** *Simultaneous ^{1}H NMR quantification of stable isotope enriched metabolite in multiplexed labeling. Stable Isotope Resolved Metabolomics*. 65th ENC Asilomar April 2024

D. R. Crooks, Y. Yang, A. N. Lane, J. R. Brender, M. C. Krishna, W. M. Linehan. Lipid Biosynthesis as a Biomarker of Metformin Treatment in Renal Tumor Cells Using Stable Isotope Resolved Metabolomics and High Field NMR. ISMRM 2024, Singapore. May 2024.

M. M. Y. Kaddah; T. W-M. Fan; A.N. Lane; R.M. Higashi Stable Isotope Resolved Metabolomics of cancer cells by Cation-Exchange Ion Chromatography Coupled to Ultra-High Resolution Mass Spectrometry. ASMS, Anaheim. June 2024

Y. Yang; D.R. Crooks; L. S. Schmidt; C. J. Ricketts; N. Maio; R.Holewinski; T.Andresson; R. Higashi; T. W.-M. Fan; A. Lane; Y. Yang; C.C. Vocke; W. M. Linehan. Quantification of intra- and extracellular metabolites in Birt-Hogg-Dubé syndrome renal tumors by Ultra-High-Resolution Mass Spectrometry based Stable-Isotope-Resolved Metabolomics. ASMS, Anaheim. June 2024

Lab Activity:



Dr. Christine Brainson's Lab:

Erika Skaggs (Brainson Lab) received a grant through the UK Artificial Intelligence and Machine Learning Hub to evaluate the AI-based digital pathology quantification program called HALO. Dr. Sally Ellingson is co-I on the project.

Dr. Yekaterina Zaytseva's Lab:

04/2024 Jerika Durham, The honorable mention poster winner, 2024 John P. Wyatt Environment and Health Symposium, Lexington, KY

04/2024 Josiane Tessmann, The best research poster winner, 2024 John P. Wyatt Environment and Health Symposium, Lexington, KY

05/2024 Mariah Geisen, oral presentation (graduate student category) at the Markey Cancer Center Research Day

05/2024 Courtney Kelson, 1st Place poster presentation (graduate student category) at the Markey Cancer Center Research Day

07/2024 Mariah Geisen was appointed to the T32 Traineeships in Cancer Biology





Dr. Luksana Chaiswing's Lab:

Kahleel Guerrier—3rd Place Poster Presentation, Clinical Science, Markey Cancer Research Symposium.
"Utilizing Mitochondria Modulating Agents to Sensitize Prostate Cancer to Radiation Treatment."

Nolan Marcum—CURE (Commonwealth Undergraduate Research Experience) Summer Fellowship (May 15 to August 8)

Malinda Rijai—OBE (Office of Biomedical Education) Summer Fellowship (May 15 to August 8)

Dr. Eva Goellner's Lab:

Breanna Knicely delivered a selected oral presentation at the CCTS Symposium. She participated in the 1 Minute Poster Pitch and won first place!



Faculty Awards and Recognition:

The University of Kentucky College of Medicine is excited to share the winners of the third annual Mission, Vision, Pillar, and Enabler (MVPE) Awards.

Mission Award

Christine Brainson, PhD | Faculty Winner
Associate Professor with Tenure, Toxicology and Cancer Biology
Department Diversity Ambassador

Dr. Christine Brainson:



Dr. Brainson's unwavering commitment to diversity and inclusivity, combined with her exceptional mentoring and groundbreaking research in lung cancer, positions her as a catalyst for positive change in the realms of education, health care, and research. Her efforts not only enrich the academic and scientific landscape at the University of Kentucky College of Medicine but also contribute significantly to the well-being of Kentuckians, leaving an indelible mark on the pursuit of excellence in these critical domains.



Dr. Eva Goellner, Assistant Professor, was nominated for the “Excellent Research Mentor Award” for undergraduate students!

Welcome Reception Hosted for Dr. Eunus Ali!

A welcome reception was hosted for Dr. Eunis Ali following the faculty meeting on May 21, 2024. Dr Ali recently arrived at the University of Kentucky as an Assistant Professor. Dr. Ali previously worked as a Post-doc at Northwestern University in Illinois for over 7 years.

Dr. Ali has a PhD in Biochemistry & Cell Biology from the Flinders University School of Medicine. He has published several important articles regarding cancer metabolism. His study on how cancer cells hijack nucleotide metabolism to boost their cell proliferation compared to normal cells has been published in Molecular Cell.

A well-traveled individual, he has obtained degrees on 2 continents, performed research on 3 continents and resided on 4 continents. He has a fondness for learning about new cultures and lifestyles.

Please introduce yourselves to our newest faculty member!



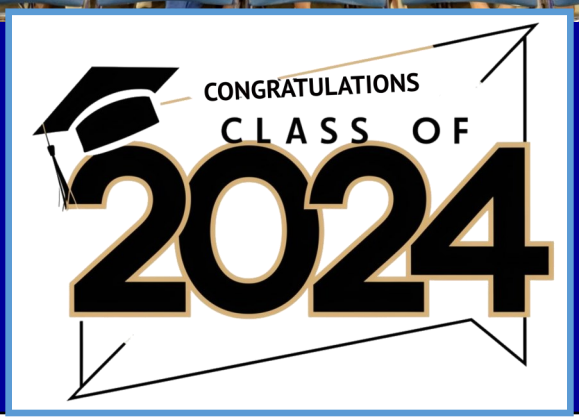
Congratulations!











(L to R) Row 1: Jennifer Grasso, Ila Iniyavan, Hannah Harrell, Lexi Obman,
Row 2: Trudy Colaco, Latasha Thompson, McCall Price, Carlee Potter, Alexis Corriette, Kayla Wolf, Sky Lafary,
Row 3: Fernando Cardenas, Hailey Fite, Malone Lee, Amber Fregalette, Dr. Nathan Vanderford



Dr. Kassandra Naughton with mentor Dr. Christine Brainson.



Dr. Saptadwipa Ganguly with mentor Dr. Vivek M. Rangnekar.

Sapta plans to train as a post-doctoral fellow.



(L to R) Dr. Kendall Simpson, mentor Dr. Xiaoqi Liu, Dr. Katelyn Jones.

Kendall has accepted an assistant professor role at EKU teaching vertebrate physiology.



(L to R) Dr. Hong Jiang, Dr. Aziza Alshahrani, Dr. Qiou Wei

Aziza will be joining King Khalid University in Abha, Saudi Arabia as an Assistant Professor with a research lab!

DTCB Faculty and Students attend AACR Annual Meeting!

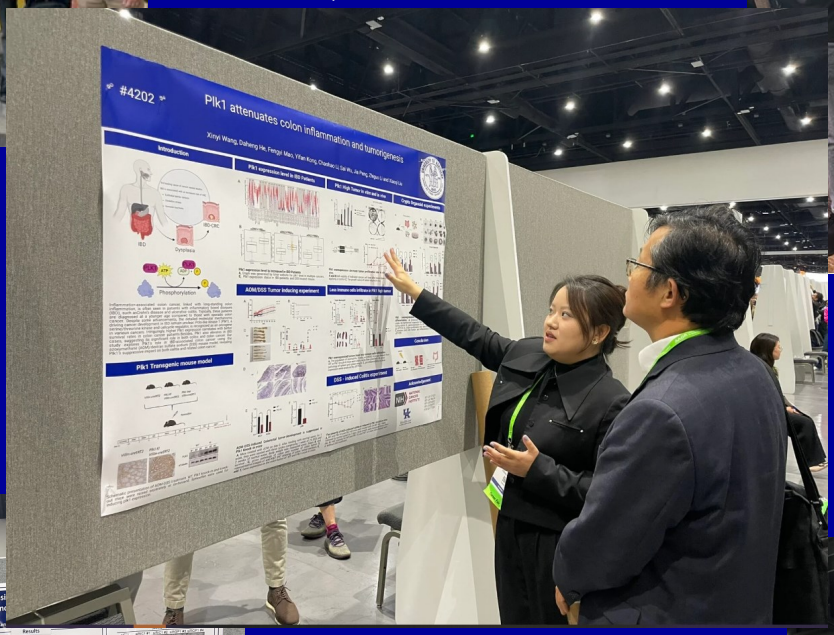


(L to R) Dr. Yanquan Zhang, Dr. Ricky Wang, Dr. Xiaoqi Liu, Dr. Jinghui Liu, and Dr. Zhiguo Li

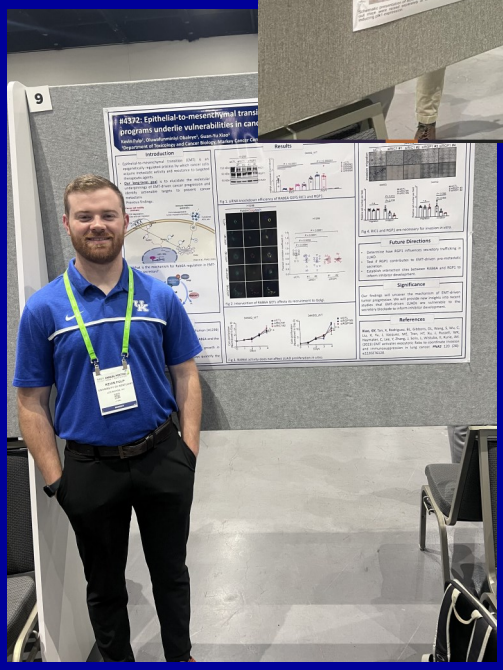


PhD students arrive at the welcome party for AACR!

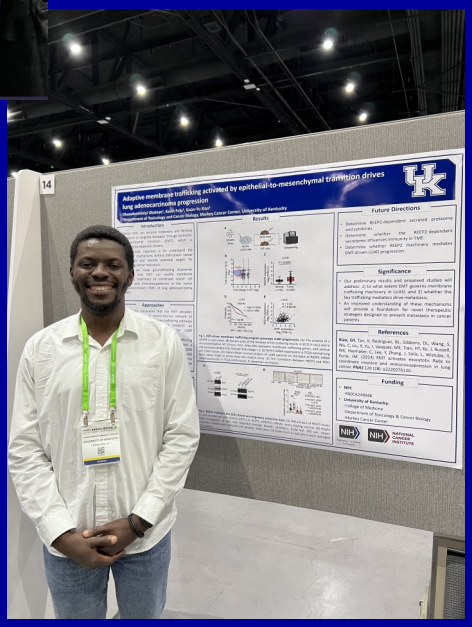
(L to R) Niyi Obaleye, Kevin Fulp, Mariah Geisen, Josiane Tessman, and Jerika Durham



PhD Candidate, Xinyi Wang, speaks to a visitor during the poster presentation at AACR. Xinyi is part of Dr. Liu's lab.



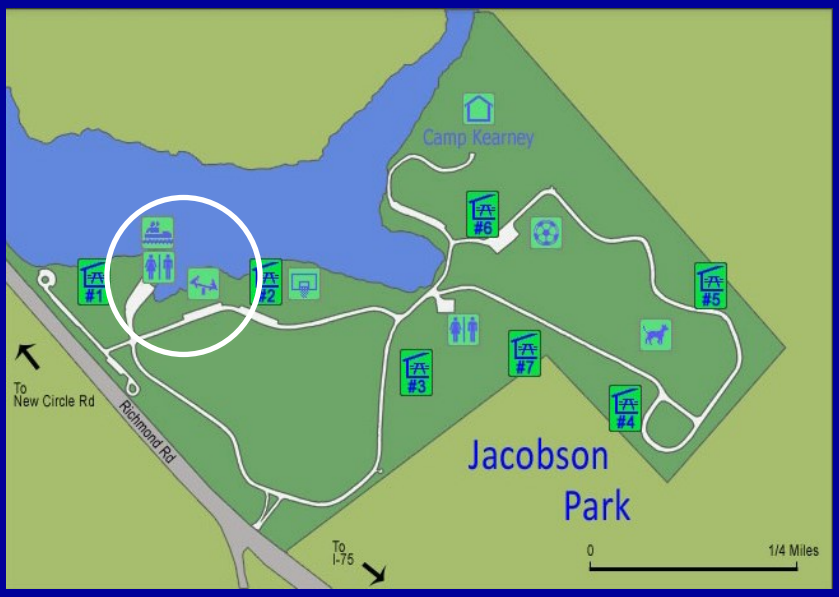
PhD Candidate, Kevin Fulp, gives a poster presentation for Dr. Guan-Yu Xiao's lab.



PhD Candidate, Niyi Obaleye, gives a poster presentation for Dr. Guan-Yu Xiao's lab.

Student Forum Events:

Join the student forum June 29th for kayaking at Jacobson Park!



Who: DTCB Student Forum

What: Kayaking at Jacobson Park

When: June 29th, 11 AM

Where: 4001 Athens-Boonesboro Rd, Lexington, KY



Fall 2024 Semester: DTCB Faculty Grant Talk Series

12:00-1:00 PM

HKRB 410A

Sept 6 — Dr. Qiou Wei

Sept 20 — Dr. Changhai Tian

Oct 4 — Dr. Zhiguo Li

Oct 18 — Dr. Christine Brainson

Nov 1 — Dr. Xiaoqi Liu

Fall 2024 Semester: DTCB Trainee Talk Series

12:00-1:00 PM

MN 463

Sept 13 — Miyeong Kim (Fong) and Cheng Zhang (Fong)

Sept 27 — James Rao (Liu) and Josiane Tessman (Zaytseva)

Oct 11 — Mithu Howlader (Li) and Mansoureh Nouri (Liu) *in MN 263

Oct 25 — Felix Oyelami (J Yang) and Andrew Shinkle (J Yang)

Nov 8 — Kahleel Guerrier (Chaiswing) and Sara Macias Palacio (Chaiswing)

Nov 22 — Elham Zokaei (HS Yang) and Zeng Liang (HS Yang)

NEWSLETTER ITEMS

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

