DEPT. OF TOXICOLOGY AND CANCER BIOLOGY NEWSLETTER

Volume 3, Issue 3

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THANK YOU!

MedChemExpress gave $1,000 to specifically sponsor a separate joint lab retreat for Drs. Xiaoqi Liu, Li, and Fong.

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

Dr. Zhiguo Li: NIH R01 CA266579, "Targeting Polo-Like Kinase 1 in Prostate Cancer to Enhance Therapeutic Efficacy". Total funding: $2,226,128 for 5 years. The studies of this proposal will dissect the role of Plk1/p62/Nrf2 signaling pathway in CRPC, and to exploit the potentially therapeutic strategies that could be benefit the CRPC patients. Specifically, the proposed study aims to test the central hypothesis that polo-like kinase 1 (Plk1) in the regulation of MDSC by activating p62/Nrf2 signaling pathway, eventually contributing to disease progression into castration -resistant stage. Co-Investigators include Drs. Derek Allison, Lutz, Charles, and Jinpeng Liu.

Dr. Xiaoqi Liu: 1. NIH R01 CA157429, "Overcoming Drug Resistance of Castration-Resistant Prostate Cancer". Total funding: $1,447,357 for 5 years. The studies of this proposal will dissect how Plk1-associated kinase activity regulates epigenetic change. Specifically, the proposed study aims to test the central hypothesis that Plk1 phosphorylation of EZH2 leads to a functional switch from PRC2-dependent gene repression to PRC2-independent but AR-dependent transcription activation, eventually contributing to disease progression into castration-resistant stage. Most of the preliminary data of this grant was generated by Dr. Ricky Wang, a former graduate student of the lab. Co-Investigators include Drs. Derek Allison, Li Chen, and Christine Brainson. This is the second competitive renewal of an existing grant, originally started in 2011.
2. COBRE COM pilot: Plk1 in serine metabolism of prostate cancer

Dr. Teresa Fan:
1. R21EB032515 C. Zhu PI, T. Fan co-I. Non-destructive optical spectroscopic assay for high-throughput metabolic characterization of in vitro cell models and patient-derived organoids.
2. COBRE CCM pilot QB She PI, T. Fan co-I. Metabolomics support for lipid metabolism reprograming analysis.
3. COBRE CCM pilot BM Evers PI, T. Fan co-I

Dr. Richard Higashi: COBRE CCM pilot T. Barrett PI, R. Higashi co-I. Validation of peripheral blood exosome lipid biomarkers in lung cancer and IBD.

Recently Accepted or Published Manuscripts:

Dr. Xiaoqi Liu:
1. Mao, F., Kong, Y., Liu, J., Rao, X., Li, C., Donahue, K., Zhang, Y., Jones, K., Zhang, Q., Xu, W., and **Liu, X.** (2022) Diptoindonesin G antagonizes AR signaling and enhances the efficacy of anti-androgen therapy in prostate cancer. The Prostate. 82, 917-932.
2. Li, C., Liu, J., He, D., Mao, F., Rao, X., Zhao, Y., Lanman, N.A., Kazemian, M., Farah, E., Liu, J., Ngule, C.M., Zhang, Z., Zhang, Y., Kong, Y., Li, L., Wang, C., and **Liu, X.** (2022) GSTM2 is a key molecular determinant of SG-ARIs resistance. Oncogene, doi: 10.1038/s41388-022-02444-1. Online ahead of print. PMID: 36038661.
3. Zhang, Z., Cheng, L., Li, J., Qiao, Q., Karki, A., Allison, D.B., Shaker, N., Li, K., Utturkar, S.M., Lanman, N., Rao, X., Rychahou, P., He, D., Konieczny, S.F., Wang, C., Shao, Q., Evers, B.M. and **Liu, X.** (2022) Targeting Plk1 sensitizes pancreatic cancer to immune checkpoint therapy. Cancer Research, doi: 10.1158/0008-5472.CAN-22-0018. Online ahead of print. PMID: 35950917.
4. Kong, Y., Allison, D. B., Zhang, Q., He, D., Li, Y., Mao, F., Li, C., Li, Z., Zhang, Y., Wang, J., Wang, C., Brainson, C. F., and **Liu, X**. (2022) Plk1 overexpression promotes development of Kras/TP53-driven lung adenocarcinoma. Online ahead of print.

Recently Accepted or Published Manuscripts:

Dr. Changhai Tian:
1. **Tian C**, Gao L, Rudebush TL, Yu L and Zucker IH*. Extracellular vesicles regulate sympatho-excitation by Nrf2 in heart failure. Circulation Research. 2022; 131:00–00. DOI: 10.1161/CIRCRESAHA.122.320916 (#Corresponding authors) (IF:23.213)

Dr. Jin-Ming Yang:
1. **Yang JM**, Ren Y, Kumar A, Xiong X, Das JK, Peng HY, Wang L, Ren X, Zhang Y, Ji C, Cheng Y, Zhang L, Alaniz RC, de Figueiredo P, Fang D, Zhou H, Liu X, Wang J, Song J. NAC1 modulates autoimmunity by suppressing regulatory T cell-mediated tolerance. Sci Adv. 2022 Jul;8(26):eabo0183. doi: 10.1126/sciadv.abo0183. Epub 2022 Jun 29. PMID: 35767626; PMCID: PMC9242588.

Dr. Luksana Chaiswing:
1. **Chaiswing, L.;** Xu, F.; Zhao, Y.; Thorson, J.; Wang, C.; He, D.; Lu, J.; Ellingson, S.R.; Zhong, W.; Meyer, K.; Luo, W.; St. Clair, W.; Clair, D.S. The RelB-BLNK Axis Determines Cellular Response to a Novel Redox-Active Agent Betamethasone during Radiation Therapy in Prostate Cancer. Int. J. Mol. Sci. 2022, 23, 6409. https://doi.org/10.3390/ijms23126409

Drs. Fan, Higashi and Lane:
1. J. Drury, L. E.A. Young, T. L. Scott, C. Kelson, D. He, J. Liu, Y. Wu, C. Wang, H.L. Weiss, **T. Fan**, M.S. Gentry, R. Sun, and Y. Y. Zaytseva* (2022) Tissue-specific deletion of fatty acid synthase is associated with increased survival and suppressed intestinal tumor development in the mouse model of Apc-driven colorectal cancer. Int. J. Molec. Sci. 23:6510
2. P. Lin, **T. W-M. Fan** and **A. N. Lane*** (2022) Chemoselection and Isotopomer Distribution Analysis by NMR. Methods 206: 8-17
3. S. Kang, L. Liu, T Wang, M. Cannon, P. Lin, **T. W.-M. Fan**, D. A. Scott, H.J. Wu, **A. N. Lane**, and R. Wang* (2022) Neurotransmitter γ-aminobutyric acid (GABA) functions as a bioenergetic and signaling gatekeeper to control T cell inflammation. Nat. Metabolism In press
4. T. Chihanga, S. Vicente-Muñoz , S. Ruiz-Torres, B. Pal , M. Sertorio , P. R. Andreassen , R. Khoury, P. Mehta, S. M. Davies, **A. N. Lane**, L. E. Romick-Rosendale , S. I. Wells (2022)
Dysregulation of Mitochondrial Metabolism in Fanconi Anemia-Deficient Cells. https://encyclopedia.pub/entry/24921
5. Scott, T.L; Zhu, J; Cassel, T.A; Vicente, S., Lin, P., **Higashi, R.M; Lane, A.N*; Fan, T.W-M*** (2022). A small-scale microwave-assisted acid hydrolysis method for glycogen determination and turnover in biological samples using Stable Isotope Resolved Metabolomics. Metabolites 12: 760
6. Lin, P., Crooks, D., Linehan, W.M., **Fan, T. W-M., Lane AN.*** (2022) Resolving enantiomers of 2-hydroxy acids by NMR. Anal Chem https://doi.org/10.1021/acs.analchem.2c00490
7. **T. W-M. Fan***, S. Daneshmandi, T. A. Cassel, M.B. Uddin, J. Sledziona, P. Lin, P. T. Thompson, **R. M. Higashi, A. N. Lane*** (2022) Polarization and b-glucan reprogram immunomodulatory metabolism in human macrophages and ex vivo in lung cancer tissues. J. Immunol. **Accepted**

Faculty Activity:

Dr. Xiaoqi Liu, Presentations:

1. July 27-31, 2022, The 18th Society of Chinese Bioscientists in America Scientific Symposium, Boston, MA. “Plk1 in prostate cancer progression and therapy resistance”.

2. August 18, 2022, University of Louisville, Department of Pharmacology and Toxicology, Louisville, KY 40202 “Plk1 in lung cancer”.

3. August 26, 2022, University of Georgia, Department of Environmental Health Science, Athens, GA 30602 “Plk1 in Cr (VI)-induced lung cancer progression”.

Dr. Teresa Fan, Presentations: Innate immune activation by checkpoint inhibition in human patient-derived lung cancer tissues. 7th CESB Metabolism on Metabolism, UKy

Faculty Activity:

Dr. Jin-Ming Yang: Oncological Sciences F09C fellowship study section. July 14-July 15, 2022

Dr. Nathan Vanderford, Awards - Congratulations on all of your amazing accomplishments!:

1. Academy of Medical Educator Excellence in Medical Education Award, Teaching. Award recognizes members of the faculty who have made significant contributions in the educational programs in the College of Medicine at the University of Kentucky.
2. Society of Research Administrators International Excellence Award - Advanced. The award results from your ability to be a self-starter in both your workplace and in your own professional development, as well as your contributions as a speaker at SRAI Meetings.
3. Elected to fill one of two basic science seats on Faculty Council for the next three-year term.

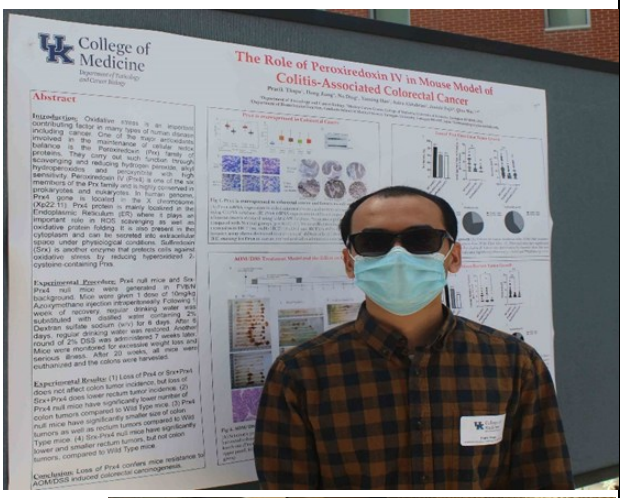
Dr. Nathan Vanderford: Member/Co-chair, National Institutes of Health, Risk, Prevention and Health Behavior F16 Fellowship Special Emphasis Study Section (2022/10 ZRG1 F16-L (20) L)

Lab Activity:

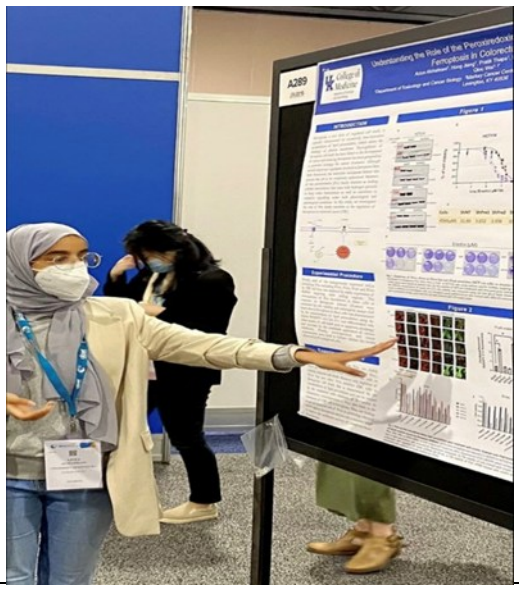
The Wei Lab at 2022 ASBMB Meeting:



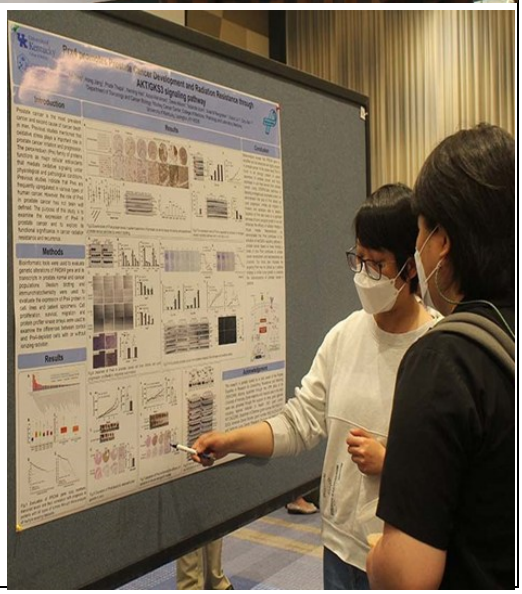
Left: Yanning Hao



Right: Pratik Thapa



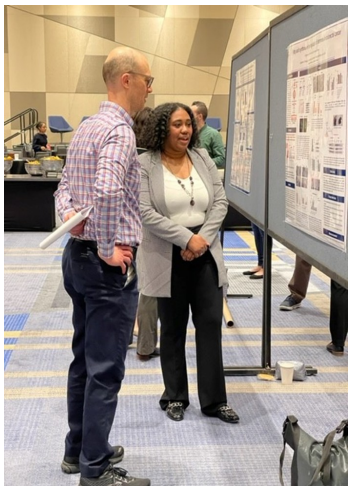
Left: Aziza Alshahrani



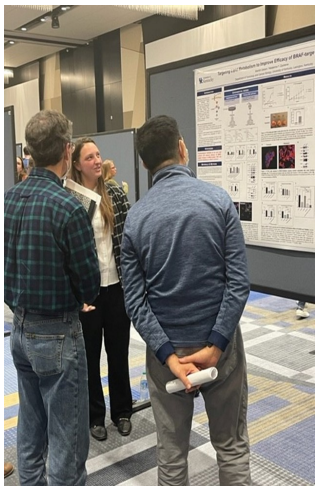
Right: Na Ding

Lab Activity:

The Zaytseva Lab at a Meeting:



Courtney Kelson



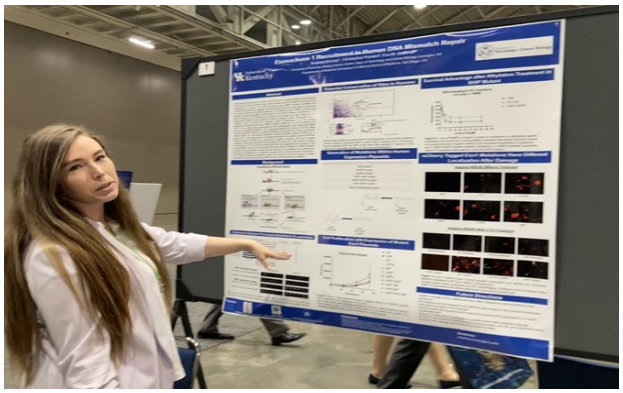
Mariah Geisen

The Xiaoqi Liu Lab at 2022 AACR Meeting:

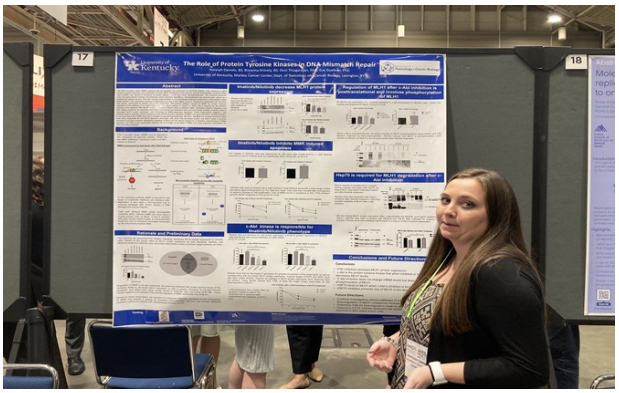


Everyone!

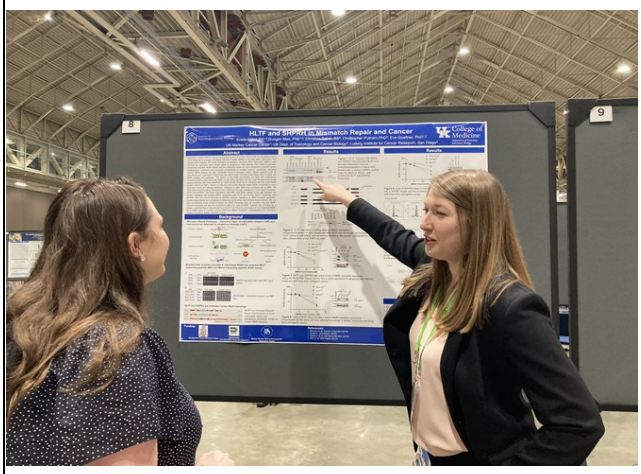
The Goellner Lab at 2022 AACR Meeting:



Breanna Knicely



Hannah Daniels



Kristin Miller



Everyone!

2022 DTCB Annual Retreat

This year's Retreat was held August 11, 2022 at UKY's Gatton Student Center. This year's Retreat was sponsored by Dr. David Li from MedChemExpress, LLC. Thank you everyone who helped organize it!

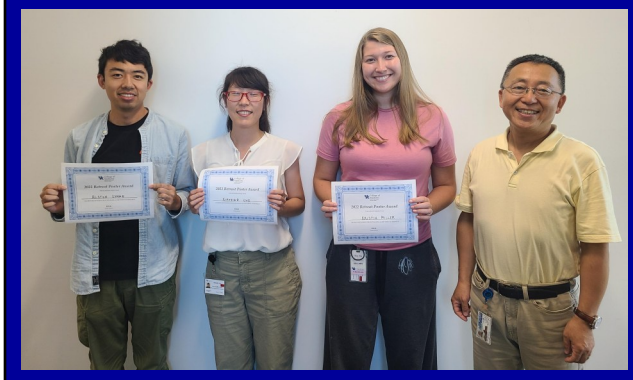








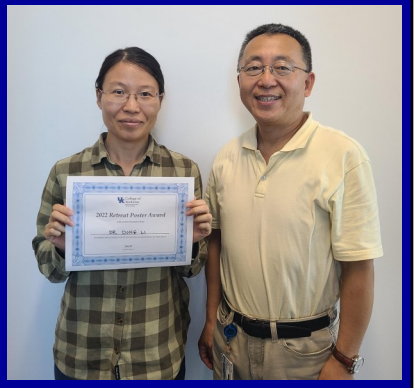
2022 Retreat Poster Awards ($50)



Senior Students (L to R):
Qiongsi Zhang (Xiaoqi Liu)
Xiaojing Cui (Ying Liang)
Kristin Miller (Eva Goellner)



Junior Student:
Chrispus Ngule (J. Yang)



Post Doctoral Scholar:
Dong Li (Xia Liu)

2022 DTCB Fellowships and Awards



Thesis Fellowship ($30,000): Xiaojing Cui (Liang)



Excellent Research Fellowship ($30,000): Na Ding (Wei)



Research Fellowship ($5,000): (L to R) Kristin Miller (Goellner), Yanning Hao (Wei), Mariah Geisen (Zaytseva), Hannah Daniels (Goellner)



Yulan Sun's Early Publication Award ($500): (L to R) Kristin Miller (Goellner), Na Ding (Wei)



Yulan Sun's Outstanding Graduate Student Award ($1,000): (L to R) Chaohao Li (Liu), Jenni Ho (St. Clair)



Dr. Matt Devalaraja Grad Student Travel Award ($500): (L to R) Chrispus Ngule (J. Yang), Kassandra Naughton (Brainson), Caitlin Miller (Chaiswing)

Welcome to our new students!



Some of the new PhD Students



New Forensics Students



New TOX MS Student

New PhD Students:
Tristin Miller, Hamed Maasoumyhaghighi, Han Cong, Rakibul Alam, Mohammad Esfini Farahani, Min Zhang, Avery Childress, Maria Edwin, Christian Gosser, Kahleel Guerrier, Cheng Zhang, Dave-Preston Esoe.

New Forensics Students:
Amber Fregalette, Latasha Thompson, Alexis Corriette, Hailey Fite, Ila Iniyavan, Malone Lee, Alexis Obman, Hannah Harrell, Sky Lafary, Jennifer Grasso, Fernando Cardenas, McCall Price, Dylan Welch, Carlee Potter, Kayla Wolf.

New TOX MS Student:
Abigail Freeman

Lab Placement of Second Year PhD Students

Dr. Zhiguo Li Lab - Amos Akinyemi
Dr. Kate Zaytseva Lab - Jerika Durham
Dr. Ying Liang Lab - Kevin Fulp, Niyi Obaleye
Dr. Eva Goellner - Breanna Knicely
Dr. Xiaoqi Liu - Tempany Arbogast, Fatemeh Seilani, Maria Nur, Sai Wu



Congratulations to our PhD Students who passed their qualifying exam!



L to R: Tempany Arbogast, Charles Bailey, Mariah Geisen, Sarah Alqithami, Chrispus Ngule

The Student Forum has been coordinating some fun activities! Check it out -

July: Mammoth Cave Kayaking





Other Activities:

July: Tours of Mammoth Cave
August: General Meeting
September: Welcome Back Party!

Keep an eye on your email for future activities and meetings!



Cancer Biology T32 Fellows:

Congratulations to Courtney Kelson and Kate Jones on being awarded Predoctoral Fellowship positions on the Cancer Biology T32 (Markey Cancer Center)!





Recent PhD Graduation:

Dr. Chaohao Li (Xiaoqi Liu)
Dr. Li is now a Postdoctoral Scholar in Dr. Xiaoqi's Lab



Congratulations!

Alumni Awarded K01:

Dr. Christina Wicker (Dr. Tadahide Izumi's former student), now a postdoc at University of Cincinnati awarded K01.

Grant title: Mentored Career Development Award: Isothiocyanates to Improve response to Proton Radiotherapy

Funding agency: National Institute of Dental & Craniofacial Research

Total Award: $300K

Budget period: 2022 -2025