**Meharry Cancer Summer Research Program**

Mentor Project Descriptions/Research Project Areas

**A. Basic/Translational Research**

*Zhenbang Chen, Ph.D.*

The research in Dr. Zhenbang Chen’s laboratory focuses on dysregulated signaling pathways in prostate cancer. His group has published several important discoveries on SKP2, androgen receptor (AR), ARF and MET essential oncogenic signaling in prostate cancer. Students in his laboratory will use cultured cells and animal models to explore molecular signaling pathways that influence prostate cancer growth and progression.

**Recent Publications:**


Sanford Barsky, M.D.
The research of Dr. Barsky’s laboratory is focused in the field of tumor biology and metastasis, particularly on discoveries underlying the mechanisms of metastatic progression of human breast cancer with a focus on inflammatory breast cancer, a disease that affects minorities and a disease with striking health care disparities. Recently the lab observed that inflammatory breast cancer produces lymphovascular emboli that bud into daughter emboli which eventually form micrometastases. Students working in Dr. Barsky’s lab would study the molecular mechanisms involved in this phenomenon.

Recent Publications:


Jamaine Davis, Ph.D.
The Davis laboratory uses an interdisciplinary approach (biochemistry/biophysics, bioinformatics, cell and structural biology) to elucidate mechanisms of genomic maintenance and regulation in breast cancer. Their challenge is to understand how genomic and proteomic variations affect health, disease and drug response. To address this, the lab seeks to define how dysregulated
protein-protein interaction networks obtained from bioinformatics (patient data) influence disease. They also model these observations in cell systems to determine the best course of therapy for breast cancer patients. Students working with Dr. Davis and his team will use in vitro models of breast cancer to study the structure and function of proteins involved in DNA damage repair.

Recent Publications:


Sakina Eltom, D.V.M, Ph.D.
The research in Dr. Eltom’s laboratory overlaps molecular aspects of environmental toxicology and chemical carcinogenesis. One area of research explores molecular mechanisms involved in the signaling pathways of the aryl hydrocarbon receptor (AhR) in breast cancer. The second area of research involves the examination of the differential role of environmental chemicals on the etiology of breast cancer in pre-menopausal African American and Caucasian women. The overall objective of this study is to identify biological factors contributing to the ethnic variation in breast cancer and provide mechanistic data on the possible differential role of environmental chemicals on the biology of breast cancer. Students working within the Eltom laboratory will
use cell lines to study the biology of AhR and the effects of environmental chemicals on breast cancer.

Recent Publications:


**Dana Marshall, Ph.D.**

Dr. Dana Marshall’s research focuses on identifying factors that contribute to the disparity in mortality between African-American males and their Caucasian counterparts. Her work includes the acquisition of clinical and demographic information from individuals treated for oral cancer at Nashville General Hospital at Meharry and in the Meharry Oncology Clinics. Patient tissues are evaluated molecularly for HPV as well as for other molecular clues predictive of outcome. She also works with cell lines, characterizing the role of Alpha2-HS glycoprotein (AHSG) in enhancing metastatic properties of oral squamous cell carcinoma cells while also characterizing isoforms of human AHSG using mass spectrometry.
Recent Publications:


Smita Misra, Ph.D.
Dr. Misra’s research focuses on various aspects of breast carcinogenesis, particularly the gene expression regulation, posttranscriptional regulation of RNA and the molecular mechanisms of breast tumor growth, aggressiveness, progression to invasion and metastasis. The objective of this work is to understand the basis for the progression of breast cancer, with the aim to develop novel biomarkers for the detection and targeted therapies that may be useful in the development of chemotherapy and cure/control/eradication of breast cancer in particular along with other cancers. Students working with Dr. Misra would examine gene expression and RNA regulation within human breast cancer cells.
Recent Publications:


**Siddharth Pratap, Ph.D.**

Dr. Pratap is Director of Bioinformatics and Proteomics at Meharry Medical College. Dr. Pratap has collaborated with program mentors on cancer-focused genomics and proteomics research. He will serve as a co-research mentor for students performing cancer bioinformatics research projects and provide advice on the appropriate bioinformatics tools needed to complete each student’s study.

Recent Publications:


Amos Sakwe, Ph.D.

Dr. Sakwe’s research focuses on the molecular basis of cancer progression, metastasis and chemoresistance. His laboratory uses molecular and cell biology, and biochemical techniques as well as animal models of breast cancer to study the role of calcium binding and calcium activated proteins in breast cancer progression and metastasis. The laboratory is also interested in drug discovery techniques to identify drugs that attenuate the progression of breast cancer. Students working in the Sawke laboratory will use human cell lines and other in vitro models to study breast cancer progression and metastasis.

Recent Publications:


**Anil Shanker, Ph.D.**

The central focus of Dr. Anil Shanker’s laboratory is to understand the molecular mechanisms of intratumoral functional cross-talk between T lymphocytes and natural killer (NK) cells. They are also invested in dissecting the mechanisms of immunomodulation by the proteasome inhibitor bortezomib, Notch ligands, and neurotransmitters in adoptive T cell/NK cell transfer settings in an effort to optimize lymphocyte effector function for cancer therapy. His laboratory is also interested in identifying common functional immune signatures and specifying Notch and lymphocyte repertoires in racial and ethnic minorities that could correlate with strong anti-tumor responses. Students working in Dr. Shanker’s laboratory will use *in vitro* and *in vivo* models of cancer to explore these different aspects of cancer immunology.

**Recent Publications:**


Deok-Soo Son, D.V.M., Ph.D.
The laboratory of Dr. Son examines the role of proinflammatory chemokines on the progression of ovarian cancer and the link between obesity and breast cancer. Students working in this laboratory will have an opportunity to study chemokine networks in models of human ovarian cancer in order to determine which chemokines can be used as biomarkers and therapeutic targets.

In a second project, the Son lab has identified a proinflammatory chemokine profile linking obesity and breast cancer. Students working on this project will perform experiments designed to define the roles of obesity-promoted proinflammatory chemokines on the progression of breast cancer.

Recent Publications:


LaMonica Stewart, Ph.D.
Dr. Stewart’s laboratory studies signaling pathways activated by the peroxisome proliferator activated receptor (PPARγ). Her laboratory also studies interactions between the androgen receptor signaling pathway and PPARγ in human prostate cancer cells. Students working in Dr. Stewart’s laboratory will use human prostate cancer cell lines to explore how PPARγ agonists and the anti-diabetic drug metformin regulate prostate cancer growth and progression.

Recent Publications:
1: Olokpa E, Moss PE, Stewart LV. Crosstalk between the Androgen Receptor and PPAR Gamma Signaling Pathways in the Prostate. PPAR Res. 2017; 2017:9456020.


B. Clinical/Community-Based Research

Maureen Sanderson, M.P.H., R.D., Ph.D.  Dr. Maureen Sanderson has a background in cancer epidemiology, with specific training and expertise in breast cancer, prostate cancer, human papillomavirus (HPV) related cancers, lung cancer, and cancer survivorship. Much of her research has been conducted as community based participatory research. Students who work with Dr. Sanderson will design, conduct, and interpret epidemiologic studies that focus on the causes of and means of preventing cancer.

Recent publications:


Flora Ukoli, M.D., M.P.H. The research of Dr. Flora Ukoli focuses on developing culturally appropriate prostate cancer education interventions particularly for low-income and low-education populations that will improve the level of knowledge about prostate cancer and positively impact attitude to early detection. A second area of interest is to investigate dietary exposures that might contribute in some way to the high prostate cancer risk and burden observed in African-Americans. Students working with Dr. Ukoli will have the opportunity to perform community-based participatory research and epidemiological studies to determine the effect of diet and gene-environment interactions on prostate cancer risk.

Recent Publications:


