Internship Directory: Roswell Park Summer Research Experience Program in Oncology (Medical Students)

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Lei Wei *Dept. of* ***Bioinformatics/Biostatistics*** **www.roswellpark.org / Lei-Wei**	Cancer bioinformatics;Cancer genetics	Scientific Research	**Identifying driver mutations by using next generation sequencing (NGS)** Next generation sequencing (NGS) is providing an efficient system for characterizing cancer genomes. By comparing with the matched normal DNA, we can identify additionally acquired mutations, so called somatic mutations in cancers. Certain somatic mutations may directly contribute to tumorigenesis process by disrupting tumor suppressors or activating oncogenes. Identifying such driver mutations is an important step for understanding the mechanism of cancers and facilitating the development of personalized treatments. The current research will work on the somatic mutations found by NGS in various cancer types. The trainee will be expected to: 1) develop a good understanding of cancer NGS data; 2) by doing literature search and data-mining, identify novel mutations/mechanisms that may contribute to tumor initiation, progression and recurrence; 3) contribute to scientific publications.
Andrei Bakin *Dept. of* ***Cancer Genetics*** **www.roswellpark.org / Andrei-Bakin**	Cancer genetics;Cancer molecular and cellular biology;Tumor immunology & immunotherapy	Scientific Research	**Tumor-Fibroblast crosstalk In Breast Cancer progression and Tumor Angiogenesis** Tumor microenvironment facilitates cancer recurrence and metastasis, and can reduce the efficacy of anti-cancer therapy. Tumor-infiltrating myeloid-derive cells and tumor-associated fibroblasts are major components of breast cancer microenvironment that affect disease progression and treatment. We identified a molecular pathway that controls tumor vascularization and mobilization of pro-tumor myeloid cell populations. The study will explore the treatment strategies and the contribution of the specific factors in the identified pathway using cell culture and preclinical mouse models. Goals: To examine the treatment strategies and to define the contribution of the specific factors in the identified pathway driving the expansion and mobilization of myeloid-derived cell populations. Projects: 1. Test the effect of a pathway inhibitor in mouse models of breast cancer alone and in combination with other therapies. 2. Examine gene expression profiles after genetic inactivation of the pathway in tumor and stromal cells.

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Kent Nastiuk *Dept. of* ***Cancer Genetics and Genomics, Urology*** **www.roswellpark.org / Kent-Nastiuk**	Cancer experimental diagnostics;Cancer genetics;Cancer molecular and cellular biology;Cancer pharmacology and therapeutics;Urology	Scientific Research	**muscle loss with androgen deprivation therapy for prostate cancer, or imaging of prostate cancer** My lab is investigating how androgen regulated growth and apoptosis signaling pathways are changed in prostate cells in culture, in mouse models and in patient samples of prostate disease (BPH, inflammation, cancer). Since androgen deprivation therapy (ADT) is the principal treatment for advanced prostate cancer, and when administered for extended periods causes frailty, a major focus is examining the mechanism of ADT-induced muscle loss. We are also working to develop targeted molecular agents for both MR and photoacoustic imaging of prostate cancer (with Hans Schmitthenner, RIT). We use a broad range of techniques from whole animal imaging to protein biochemistry to gene expression analysis to determine mechanism in order to develop better therapies for prostate diseases.
Binnian Wei *Dept. of* ***Cancer Prevention and Population Sciences*** **www.roswellpark.org / Binnian-Wei**	marijuana and tobacco specific - biomarker measurement;Cancer prevention and epidemiology;Cancer molecular epidemiology;Pediatrics	Scientific Research	**Developing and Optimizing Automated Sample Preparation Methods for Measuring Tobacco- and Marijuana-Specific Biomarkers in Human Samples** Qualified candidates will work with the scientists in our lab to develop and optimize high throughput automated methods that use cutting-edge liquid-handling workstation for quantifying tobacco and marijuana specific biomarkers, i.e. nicotine, cannabinoids and their metabolites in human samples.

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Subhamoy Dasgupta *Dept. of* ***Cell Stress Biology*** **www.roswellpark.org / Subhamoy-Dasgupta**	Cancer genetics;Cancer molecular and cellular biology;Cancer pharmacology and therapeutics;Tumor immunology & immunotherapy	Scientific Research	**Metabolic Control of Tumor Progression and Metastasis** Metabolic reprogramming is an essential hallmark of tumor progression and metastasis. Cancer cells use altered metabolic pathways to sustain rapid growth and to overcome enormous stress encountered in tumor microenvironment. Tumor cells constantly alter their metabolic state in response to oncogenic stimuli, nutrient availability, and interaction with immune cells however the precise regulation that precedes the metabolic alteration is poorly understood. Our lab uses state-of-art facilities such as metabolomics, proteomics, and genomics along with molecular biology techniques to investigate the crosstalk between metabolic signaling and transcriptional networks. Multiple animal model systems including genetically engineered mouse models (GEMMs), patient-derived xenograft (PDX), and syngeneic tumor models are used to investigate metabolic adaptations that tumor progression and metastasis. Projects: (1) Metabolic adaptations driving castration resistant prostate cancer, (2) Oncogenic drivers of bone metastatic prostate cancer, (3) Mechanisms of breast tumor recurrence and metastasis.

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Asoke Mal *Dept. of* ***Cell Stress Biology*** **www.roswellpark.org / Asoke-Mal**	Cancer genetics;Cancer molecular and cellular biology;Cancer pharmacology and therapeutics; Pediatrics	Scientific Research	**Molecular mecanisms driving translocation-associated soft tissue cancer rhabdomyosarcoma** Soft tissue tumor such as rhabdomyosarcoma (RMS) is a highly malignant and the most commonly diagnosed cancer in children and adolescents. Current therapies have improved overall survival of RMS patients, yet remain lower than that for many other pediatric cancers. RMS is falls into one of two biologically distinct subgroups: embryonal RMS (eRMS) or the aggressive alveolar RMS (aRMS), however their treatment regimens have been very similar. While current therapeutic strategies have improved the overall survival in patients with eRMS (>80%), the efficacy in aRMS remains dismal (<50%). Molecularly, aRMS is defined as a specific chromosomal translocation associated fusion carrying tumor e.g. fusion PAX3-FOXO1 transcription factor and patients with fusion-positive tumors exhibit the worst prognosis (<10% overall survival). In addition, studies both from genetic and functional point of view highlight that PAX3-FOXO1 acts as a driver oncogene in aRMS tumorigenesis and tumor cells depend on continuous activity of this fusion oncoprotein. While these facts underscore that PAX3-FOXO1 is the most suitable therapeutic target for aRMS, so far, any PAX3-FOXO1 directed therapeutic strategies have not been explored. Therefore, functional studies at different molecular angles are necessary to identify tumor specific vulnerabilities that may open the door to eradicate biological behaviors of PAX3-FOXO1-positive tumor with the goal for its potential as the most effective therapeutic strategy. Since aRMS-specific PAX3-FOXO1 bearing tumor is a transcription-driven disease, our research study involves epigenetic mechanisms and signaling pathways in regulating aRMS and discovering potential therapeutic targets and strategies. Our approaches to identify tumor specific aberrations such as epigenetic mechanisms and signaling pathways, and to identify drug-like compounds by functional screening of small molecules chemical libraries will likely provide opportunities for novel therapeutic interventions in patients with fusion-positive aRMS tumors

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Gal Shafirstein *Dept. of* ***Cell Stress Biology*** **www.roswellpark.org / Gal-Shafirstein**	Photodynamic Therapy	Scientific Research	**Treatment Planning and Light Dosimetry in Photodynamic Therapy (PDT)** My research team is focused on the development and implementation of treatment planning and light dosimetry in PDT. My group includes, 2 engineers, 2 research scholars and 3 pre-doctoral student. We do preclinical and clinical studies, and investigate combination therapies.
Fumito Ito *Dept. of* ***Immunology*** **www.roswellpark.org / Fumito-Ito**	Tumor immunology & immunotherapy	Clinical Research	**Blood-based T-cell Biomarkers for Prediction of Treatment Response and Early Diagnosis of Immune-related Adverse Events to Immune Checkpoint Inhibitors** Cancer immunotherapies that target the T-cell immune checkpoints, such as CTLA-4, PD-1, and PD-L1 have shown unprecedented success for the treatment of a variety of malignancies. Although a significant number of cancer patients benefit from immune checkpoint inhibitors (CPI), many fail to have clinical responses. Some pretreatment predictors of response to immune checkpoint inhibition have been reported such as PD-L1 expression in tumor cells and the tumor microenvironment (TME), genetic alterations and mutational load in tumor cells, and pre-existing immunity and its enhancement during treatment through tumor-infiltrating immune cells, but there are limitations to tumor site analysis, especially in patients with visceral tumors. Additionally, these therapeutic agents often elicit immune-related adverse events (irAEs) that may result in substantial morbidity. Early intervention can markedly reduce the severity of the irAEs, but biomarkers that allow for their early detection and guide their management are lacking. There is a critical need for blood-based biomarkers to monitor or predict patients' clinical outcome and induction of irAE. Because CPI enhance T-cell responses, we will investigate potential blood-based T-cell biomarkers to predict and monitor treatment response and irAES in patients undergoing treatment with CPI.

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Scott Olejniczak *Dept. of* ***Immunology*** **www.roswellpark.org / Scott-Olejniczak**	Cancer molecular and cellular biology;Tumor immunology & immunotherapy	Scientific Research	**Harnessing the power of microRNAs to improve tumor immunotherapy** MicroRNAs are small non-coding RNAs that function to repress expression of target genes and thereby possess the ability to fundamentally alter how cells behave. We hope to co-opt this ability of microRNAs in order to enhance the immune response to tumor cells. A common means by which tumor cells evade immune cell killing is by signaling to immune cells through so called checkpoint molecules that repress the ability of these immune cells to function. We believe that certain microRNAs have the ability to instruct immune cells to ignore checkpoint molecule signals and therefore kill tumor cells more effectively. A major challenge, however, is to determine which microRNAs possess this ability. Summer interns will participate in screening of many known microRNAs for their ability to limit repressive signals propagated by checkpoint molecules. These studies will expose students to translational research in a basic laboratory setting with a focus on immunology, cell biology and molecular biology.
Joseph Skitzki *Dept. of* ***Immunology*** **www.roswellpark.org / Joseph-Skitzki**	Tumor immunology & immunotherapy;Surgical Oncology	Scientific Research Clinical Research	**real-time monitoring of anti-cancer immune responses** My laboratory focuses on the understanding of how lymphocytes trafficking to sites of tumor during immunotherapy. Recent advances in intravital microscopy are being leveraged for clinical translation. Specific projects in the lab are: 1. To evaluate reagents for human lymphocyte labeling 2. To determine if endogenous lymphocyte activity can be followed over time in mouse models 3. To develop analytical methods for intravital microscopy **observership in surgical oncology** I am a surgical oncologist in the area of soft tissue surgery. My focus is on melanoma and regional therapies for cancer. There are opportunities for an interested student to observe our clinic and OR practice. A melanoma clinical database exists along with corresponding tissue and blood samples which could be a source for a short-term project. The end-goal would be to generate a clinical hypothesis, extract the data and have it presented in a scientific manner (abstract, manuscript, poster)

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John Ebos *Dept. of* ***Medicine*** **www.roswellpark.org / John-Ebos**	Cancer molecular and cellular biology;Cancer pharmacology and therapeutics;Tumor immunology & immunotherapy;Surgical Oncology;Cancer genetics	Scientific Research	**Resistance and metastasis following tumor microenvironment inhibition** Student will use clinically relevant models of spontaneous metastatic disease to study resistance to antiangiogenic (VEGF pathway) and immunecheckpoint (PD-1 pathway) inhibitors.
Michael Nemeth *Dept. of* ***Medicine*** **www.roswellpark.org / Michael-Nemeth**	Tumor immunology & immunotherapy	Scientific Research	**Determining mechanisms of immune dysfunction in leukemia** The overall goal of this project is to elucidate aspects of the mechanisms that regulate the progression of bone marrow failure diseases to acute myeloid leukemia. The focus of this project will be on the impact of immune dysfunction on disease progression. This project will involve the use of pre-clinical models as well as primary patient samples.
Eunice Wang *Dept. of* ***Medicine*** **www.roswellpark.org / Eunice-Wang**	Cancer pharmacology and therapeutics;Medical Oncology;Cancer molecular and cellular biology;Tumor immunology & immunotherapy	Scientific Research	**Novel Biological Therapies for Acute Leukemia** Our laboratory research focuses on the preclinical assessment and development of novel therapeutic strategies for acute leukemia. We are specifically interested in how interactions between tumor cells and other elements of the host marrow microenvironment contribute to leukemia cell survival and therapeutic resistance. Current projects in the lab are focused on optimizing immunotherapy for acute myeloid leukemia, evaluation of novel antibody drug conjugates targeting CD33 and CD123 expressed on leukemia cells, and the role of autophagy inhibitors in overcoming therapy resistance. Students will gain experience in sterile cell culture, proliferation assays, colony formation assays using primary leukemia patient samples, flow cytometry, and bioluminescent mouse models. The goal of our translational laboratory research is to agents amenable to rapid translation into early stage clinical trials at our institute.

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Michael Higgins *Dept. of* ***Molecular and Cellular Biology*** **www.roswellpark.org / Michael-Higgins**	Epigenetics and Cancer	Scientific Research	**Epigenetic Affects of Reproductive Factors** We are interested in whether the number of pregnancies and/or the breast feeding may affect the methylation of key developmental genes in the human breast and mouse mammary gland. Methylation at one or more of these genes may impact the prevalence of more aggressive estrogen receptor negative (ER-) breast cancer. This study will involve isolation of murine mammary gland epithelial cells, their analysis by flow cytometry, as well as methylation analysis and gene expression analysis of both mouse and human mammary gland cells.
Mukund Seshadri *Dept. of* ***Oral Medicine/Head and Neck Surgery*** **www.roswellpark.org / Mukund-Seshadri**	Cancer biophysics;Cancer pharmacology and therapeutics;Radiation Oncology;Cancer experimental diagnostics;Cancer prevention and epidemiology	Scientific Research Clinical Research	**Multi-modal Imaging of Cancer** Research in my laboratory is focused on three main areas: (i) understanding the vascular biology of head and neck cancers and exploiting them for therapeutic benefit, (ii) development of safe and effective bio-adjuvant approaches for the prevention of oral cancers and, (iii) the use of advanced imaging methods such as MRI, CT in preclinical models and in patients to study response of head and neck tumors to chemotherapy and radiation. The work is interdisciplinary in nature and draws on concepts from biophysics, cancer biology, pharmacology and molecular biology. Given my clinical background, I feel strongly about pursuing a research program that addresses clinically-relevant questions in the laboratory setting and potentially translates the knowledge gained into meaningful outcomes for patients.
Boyko Atanassov *Dept. of* ***Pharmacology and Therapeutics*** **www.roswellpark.org / Boyko-Atanassov**	Cancer genetics;Cancer molecular and cellular biology	Scientific Research	**Defining the functions of Ubiquitin Specific Proteases in the regulation of Receptor Tyrosine Kinase Signaling Pathways in Cancer** Abnormal expression of receptor tyrosine kinases (RTKs) has been recognized as a key factor driving tumor progression of several cancers. Work in our laboratory is focused on elucidating the molecular mechanisms by which ubiquitin-specific proteases (USPs) are involved in RTK stabilization in cancer cells and hence potentiate tumor growth.

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Dhyan Chandra *Dept. of* ***Pharmacology and Therapeutics*** **www.roswellpark.org / Dhyan-Chandra**	Cancer molecular and cellular biology;Cancer pharmacology and therapeutics	Scientific Research	**Mitochondrial Regulation of Cell Death and Resistance in Cancer** The main focus of our research is to understand the molecular basis of therapy resistance in multiple cancer types including in prostate, breast, and colon cancers. To accomplish our goals, we are investigating two different, but complementary projects. The first project delineates how mitochondria-mediated cell death signaling is defective in cancer cells and cancer stem cells. The second project defines the role of heat-shock proteins in cancer cell survival and death. We are also characterizing the role of mitochondria in health disparities among prostate and breast cancer patients. Our research suggests that protein complexes are important regulators of cancer cell death and survival. We use multiple biochemical, genetic, cellular, mouse models of cancer, and molecular approaches to identify and characterize protein complexes in subcellular compartments including in the mitochondrion. Detailed understanding of protein complexes will lay a foundation for targeting cell death and survival machinery for cancer therapy. Our model systems include both laboratory cell culture and mouse models of cancer to examine cellular signaling in response to anticancer agents. Our ultimate goals are to understand mitochondrial biology in cancer and target mitochondria for prevention and therapy of multiple types of cancer.
Fengzhi Li *Dept. of* ***Pharmacology and Therapeutics*** **www.roswellpark.org / Fengzhi-Li**	Cancer molecular and cellular biology;Cancer pharmacology and therapeutics	Scientific Research	**Mechanism of action for FL118 analogue Hx6 to induce kidney cancer apoptosis** The student will work together with the PhD student Ms. Ieman Aljahdali to study the mechanism by which the FL118 analogue Hx6 induces apoptosis in papillary renal cell carcinoma (pRCC) cancer.

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Xinjiang Wang *Dept. of* ***Pharmacology and Therapeutics*** **www.roswellpark.org / Xinjiang-Wang**	Cancer genetics;Cancer pharmacology and therapeutics;Cancer molecular and cellular biology	Scientific Research	**Development of Novel Targeted Therapies for Leukemia Treatment** The goal of this study is to evaluate the antitumor effect of newly identified small molecule inhibitors for Mdm2-MdmX E3 ubiquitin ligase in leukemia/lymphoma cells. Specifically, we are trying to understand how these compounds kill drug-resistantleukemia/lymphoma cells and whether they can be used as novel combination therapies for melanoma and pancreatic cancer to overcome their resistance to current therapies. The summer students will be assigned to one of the current projects under supervision of experience postdocs or research associate.The projects will involve techniques of protein analysis such as Western blotting and molecular biology methods such as DNA cloning and gene expression and analysis in cancer cells, proliferation assays and cell death assays of drug-treated cancer cells.
Yuesheng Zhang *Dept. of* ***Pharmacology and Therapeutics*** **www.roswellpark.org / Yuesheng-Zhang**	Cancer pharmacology and therapeutics	Scientific Research	**Targeting ErbB receptor tyrosine kinases in cancer** Cell membrane-bound ErbB receptor tyrosine kinases, particularly ErbB1 and ErbB2, are major oncogenic drivers and cancer therapeutic targets. We have recently found that a novel human protein targets both ErbB1 and ErbB2 and are doing research to better understand its antitumor activity.

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Santosh Patnaik *Dept. of* ***Surgical Oncology*** **www.roswellpark.org / Santosh-Patnaik**	Cancer bioinformatics;Cancer biostatistics;Cancer genetics;Cancer molecular epidemiology;Cancer pharmacology and therapeutics;Tumor immunology & immunotherapy;Surgical Oncology;Cancer molecular and cellular biology;Radiation Oncology;Cancer experimental drug therapeutics	Scientific Research	**Experimental and computational examination of genes in cancer and immunology** We are interested in genetics (gene mutations, gene expression, etc.) and epigenetics (microRNAs, RNA editing, etc.) as it pertains to cancer and the human body's immunological response to it. This is a very broad area, and allows for a visiting student to contribute their ideas to develop an exciting yet feasible project to carry out during their stay. The project work will involve one or more of the following: (1) Cell biology: cell culture, genetic engineering of cells, etc. (2) Molecular biology: various DNA, RNA, and protein assays, including their development. (3) Animal biology: growing foreign tissue/cells in the mouse, analysis of DNA/RNA/proteins of mouse, etc. (4) Patient biology: various assays of diseased tissues, including association with clinical parameters; (5) Computation: large-scale data analysis, data visualization, bioinformatics, software programming, etc. As a mentor, my goal will be to help the visiting student attain the following: (1) Experience these aspects of scientific research: collate facts from published knowledge and knowledgeable individuals; use facts and imagination to generate hypotheses and exploratory ideas; design, prepare for, and execute experiments; collect, analyze, and present data; set forth a future direction. (2) Learn some common biomedical or computational research techniques. (3) Bring to completion during the student's stay a small but independent project that the student helps with the design, execution, and analysis of.
Chukwumere Nwogu *Dept. of* ***Thoracic Surgery*** **www.roswellpark.org / Chukwumere-Nwogu**	Surgical Oncology;Other (please specify);Thoracic Surgery	Clinical Research	**Minimally Invasive Thoracic Surgery Clinical Outcomes** This Internship offers the opportunity to participate in various projects related to minimally invasive (Robotic and VATS) thoracic surgical oncology, multidisciplinary thoracic oncology conferences and/or photodynamic therapy of lung tumors in mice. Observation in the thoracic surgery clinic and the operating room will be incorporated into the internship. Global health projects are also available.

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Michael Fiandalo *Dept. of* ***Urology*** **www.roswellpark.org / Michael-Fiandalo**	Urology	Scientific Research	**Inhibition of Dihydrotestosterone Synthesis in Prostate Cancer by Combined Frontdoor and Backdoor Pathway Blockade** Androgen deprivation therapy (ADT) is palliative and prostate cancer (CaP) recurs as lethal castration-recurrent CaP. One mechanism of CaP resistance to ADT is backdoor androgen metabolism. The goal of the summer research project is to assist with identification of small molecules that target enzymes used in the terminal steps in the pathways using ImageStream and immunohistochemistry.

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Khurshid Guru *Dept. of* ***Urology*** **www.roswellpark.org / Khurshid-Guru**	Urology;Medical Oncology;Surgical Oncology;Surgical training, human factors engineering, etc.	Scientific Research Clinical Research	**ATLAS Internship** Specialties: 1) Medicine 2) Engineering 3) Medical Illustration 4) Data Managing Past Intern Accomplishments: 1. Published as co-authors of manuscripts, posters, and presentations in prestigious journals and conferences such as the Journal of Urology, BJUI, IJU, AUA, ERUS, EAU, etc. 2. Develop medical technologies and apply and achieve patents for their inventions 3. Invited to attended and present projects at national conferences 4. Develop patient education tools (Android application) 5. Become a co-consenter in clinical trials where they are able to interact with patients in RPCI clinic 6. Become wet-lab certified to bed-side assist in robotic surgery labs 7. Log hours of OR observation and video classification of real cases 8. Complete the Introduction to Robotic Surgery and Introduction to Laparoscopic Surgery Curriculum (Certification) 9. Learn how to navigate patient records on multiple web-based platforms 10. Learn how to maintain, develop, and manipulate databases for research purposes **ATLAS Internship** Specialties: 1) Medicine 2) Engineering 3) Medical Illustration 4) Data Managing Past Intern Accomplishments: 1. Published as co-authors of manuscripts, posters, and presentations in prestigious journals and conferences such as the Journal of Urology, BJUI, IJU, AUA, ERUS, EAU, etc. 2. Develop medical technologies and apply and achieve patents for their inventions 3. Invited to attended and present projects at national conferences 4. Develop patient education tools (Android application) 5. Become a co-consenter in clinical trials where they are able to interact with patients in RPCI clinic 6. Become wet-lab certified to bed-side assist in robotic surgery labs 7. Log hours of OR observation and video classification of real cases 8. Complete the Introduction to Robotic Surgery and Introduction to Laparoscopic Surgery Curriculum (Certification) 9. Learn how to navigate patient records on multiple web-based platforms 10. Learn how to maintain, develop, and manipulate databases for research purposes

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Eric Kauffman *Dept. of* ***Urology*** **www.roswellpark.org / Eric-Kauffman**	Cancer genetics;Cancer molecular and cellular biology;Cancer pharmacology and therapeutics;Urology;Medical Oncology;Surgical Oncology;Other (please specify);Radiology	Scientific Research Clinical Research	**Molecular and cellular research in kidney cancer and prostate cancer** Our research is focused on kidney cancer primarily, and prostate cancer secondarily. There are two main projects undergoing. The first project investigates the role of iron metabolism and resulting oxidative stress levels in the development and progression of kidney tumors. Iron metal is among the greatest sources of oxidative stress in cells of the human body, but also provides the sole "ingredient" needed to transform precursor tissue into kidney tissue during embryo organogenesis. We hypothesize that iron is therefore important in the development of kidney tumors and their progression. In mice, administration of high levels of iron leads to mouse kidney tumors which morphologically mimic human kidney cancer. On the other hand, too high iron levels are detrimental to kidney cancers. Drug treatments targeting iron/oxidative stress metabolism will be tested in vitro and mice to determine whether kidney cancer growth can be blocked. The second project investigates "circulating" cancer cells in the bloodstream of patients with kidney or prostate tumors. These cells exist at extremely low concentrations in the bloodstream and are challenging to identify. This project is exploring cell imaging based on flow cytometry principles to characterize protein expression in these circulating cancer cells to better guide treatment decisions of kidney and prostate cancer patients. **Clinical research in kidney cancer and prostate cancer patients**This internship involves clinical data abstraction and analysis for patients diagnosed with kidney or prostate cancer at Roswell Park who have been treated with surgery or managed non-operatively with active surveillance. Comprehensive patient databases within the Department of Urology are already constructed for these patient populations and will be used to assist this research. The student will perform patient chart reviews, clinical data collection and simple data analyses to answer key questions about kidney or prostate cancer patient care. Numerous questions are currently under study, and several different options will be available to for the student to choose from. Several projects have considerable overlap with Radiology.This internship is an ideal opportunity for the highly motivated medical student who is considering a career in Urologic Oncology, Medical Oncology or Radiology.

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Yue Wu *Dept. of* ***Urology*** **www.roswellpark.org / Yue-Wu**	Cancer molecular and cellular biology;Cancer molecular epidemiology;Cancer pharmacology and therapeutics;Cancer prevention and epidemiology;Cancer bioinformatics;Cancer genetics;Urology;Medical Oncology	Scientific Research	**Understanding Progression of Prostate Cancer to Castration Re-Current Disease** My research interest is in microenvironment of cancer - how cancer cells, endothelial cells and stromal cells interact with each other, and how the interactions affect cancer cell growth. Prostate cancer models are used primarily in my lab. The ultimate goal is to delineate mechanisms that drive progression of androgen-stimulated prostate cancer to castration-resistant prostate cancer, and to identify novel modalities to prevent or treat castration-resistant prostate cancer.