



2023 Mentor Directory: High School Summer Research Experience Program in Cancer Science

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Dhyan Chandra	Pharmacology and Therapeutics	Mitochondrial Regulation of Cell Death and Resistance in Cancer	2
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Li Tang	Cancer Prevention and Population Sciences	Gene, Diet, and their interactions contributing to cancer characteristics and prognostic outcomes	7
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<p>Boyko Atanassov</p> <p><i>Dept. of Pharmacology and Therapeutics</i></p> <p>www.roswellpark.org/Boyko-Atanassov</p> <p>Mentoring style- <i>n/a</i></p> <p>Expectations of summer student- <i>n/a</i></p>	<p>Scientific Research</p> <p>Cancer genetics; Cancer molecular and cellular biology</p>	<p>Defining the functions of Ubiquitin Specific Proteases in the regulation of Receptor Tyrosine Kinase Signaling Pathways in Cancer</p> <p>Abnormal expression of several cell growth-promoting factors, such as receptor tyrosine kinases (RTKs) and cyclins, has been recognized as a critical factor driving tumor progression and resistance to therapy. Work in our laboratory is focused on elucidating the molecular mechanisms by which ubiquitin-specific proteases (USPs) are involved in stabilizing these factors in cancer cells, hence potentiating tumor growth.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Dhyan Chandra</p> <p><i>Dept. of Pharmacology and Therapeutics</i></p> <p>www.roswellpark.org/Dhyan-Chandra</p> <p>Mentoring style- <i>Provide opportunities to brainstorm ideas. Encourage student to ask questions. Guide student to develop collaborative skills to understand scientific research project.</i></p> <p>Expectations of summer student- <i>I expect summer students to learn new ideas and approaches. I expect them to brainstorm these ideas/approaches during laboratory meeting or discussion. These activities will help student developing independent thinking process in scientific research.</i></p>	<p>Scientific Research</p> <p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics; Urology</p>	<p>Mitochondrial Regulation of Cell Death and Resistance in Cancer</p> <p>The main focus of our research is to define the role of mitochondrial biology in cancer and understand the molecular basis of therapeutic resistance in multiple types of cancer including in prostate, pancreatic, breast, and colon cancers. We are working on several interconnected and complementary research projects. The first project defines the role of mitochondrial unfolded protein response in cancer progression and development of therapeutic resistance in cancer patients. The second project delineates how mitochondria-mediated cell death signaling is defective in cancer cells and cancer stem cells. The third project characterizes the role of mitochondria in cancer health disparities among Americans. We also investigating the role of mitochondrial dysfunction in age-related neurodegenerative diseases and drug abuse. Our research suggests that deregulation of protein complexes contributes to tumor progression and therapeutic resistance in cancer. We use multiple biochemical, genetic, cellular, patient-derived cancer models, mouse models of cancer, clinical, and molecular approaches to identify and characterize protein complexes in subcellular compartments including in mitochondria. We envision that detailed understanding of protein complexes will lay a foundation for targeting mitochondria, cell death, and survival machineries for better therapeutic outcomes in cancer patients. Our ultimate goals are to understand the mitochondrial biology and identify novel targets for prevention and treatment of multiple types of cancer as well as other age-related diseases.</p>

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		<p>Project phase: Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>
<p>John Ebos <i>Dept. of Medicine</i> www.roswellpark.org/John-Ebos</p> <p>Mentoring style- <i>As a group we come to the lab everyday and push ourselves to be as conceptually innovative and creative as possible, we see no limits to how much we can invest, know, read, or test experimentally. As a mentor I try to bring out your best in these areas and work on things that are needed in any profession, such as writing, speaking, and problem solving.</i></p> <p>Expectations of summer student- <i>An ideal summer student is someone who can give their best effort, commit to learning from experienced mentors, and match the enthusiasm in the lab.</i></p>	<p>Scientific Research</p> <p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics; Tumor immunology & immunotherapy; Surgical Oncology; Cancer genetics; Medical Oncology; Cancer bioinformatics; Cancer biostatistics</p>	<p>Resistance and metastasis following tumor microenvironment inhibition</p> <p>Student will use clinically relevant models of spontaneous metastatic disease to study resistance to antiangiogenic (VEGF pathway) and immunecheckpoint (PD-1 pathway) inhibitors. Student will be mentored by experienced trainees and learn several novel techniques</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Maciej Goniewicz <i>Dept. of Cancer Prevention and Population Sciences</i> www.roswellpark.org/Maciej-Goniewicz</p> <p>Mentoring style- <i>Meetings in person at least once a week to discuss progress and challenges in experiments. Weekly presentations to my lab team. Meetings in person to discuss conference submission.</i></p> <p>Expectations of summer student- <i>Conduct a pilot experiments. Collect the preliminary data. Prepare and submit at least one abstract for scientific</i></p>	<p>Scientific Research</p> <p>Cancer prevention and epidemiology; Public Health</p>	<p>Safety of electronic cigarettes</p> <p>Research projects are focused on new nicotine-containing products and alternative forms of tobacco. We examine safety and efficacy of electronic nicotine delivery devices, commonly called e-cigarettes. These studies include the laboratory evaluation of the products, pharmacological and toxicological assessment, surveys among their users, and their potential application in harm reduction, cancer prevention and smoking cessation.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>

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<p>conference or one manuscript for peer-reviewed journal.</p>		
<p>Katerina Gurova <i>Dept. of Cell Stress Biology</i> www.roswellpark.org/Katerina-Gurova Mentoring style- na Expectations of summer student- basic knowledge of molecular biology, principles of experimental design, interest and excitement about science.</p>	<p>Scientific Research Cancer molecular and cellular biology; Cancer pharmacology and therapeutics</p>	<p>Control of chromatin stability in normal and cancer cells Control of integrity of genetic information in cells includes activation of DNA damage response, DNA-repair pathways and elimination of cells with damaged DNA[1]. The control of the integrity of epigenetic information is equally important and critical for the development and function of multicellular organisms, but far less studied. Epigenetic information is stored as chromatin, the highly organized complex of DNA, histone proteins and their chemical modifications[2]. Accelerated replication and transcription during early embryogenesis and in cancer, resulting in more frequent nucleosome disassembly and enhanced histone turnover, may cause intermixing of histones bearing epigenetic marks and loss of epigenetic information. In cancer, this should lead to the dissolution of original cell identity. However, transcriptome analysis clearly demonstrates that tumors, including cell lines propagated for years in culture, bear easily identifiable traits of tissue of origin in their transcriptional program (TCGA data), which suggests that factors ensuring chromatin stability during early development are activated in cancer to support increased chromatin dynamics. To test this hypothesis, we will optimize methods, used to study of chromatin structure/organization, to measure and compare chromatin stability in normal and tumor cells and to identify factors responsible for the maintenance of epigenetic integrity. These factors may be a source of novel cancer targets. Our data suggest that histone chaperone FACT (FACilitates Chromatin Transcription) is one such factor[3-7]. We will validate FACT as a chromatin stabilizing factor and cancer treatment target. To understand how epigenetic integrity is preserved, we will use novel tools (small molecules and FACT genetic inhibitors) to controllably disassemble chromatin in cells to study consequences and cell response to chromatin destabilization. Our studies will build a foundation for understanding various phenomena, including the stability of the cell differentiation state, low rate of reprogramming and high sensitivity of tumor cells to chromatin desilencing agents.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Nitai Hait</p>	<p>Scientific Research</p>	<p>Mechanisms by which sphingolipid mediators impact tumor progression and metastasis</p>

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<p>Dept. of Molecular and Cellular Biology</p> <p>www.roswellpark.org/Nitai-Hait</p> <p>Mentoring style- <i>As a mentor, I will be supportive and enthusiastic with students. I will help students generating a hypothesis, exploratory ideas, designing and execute experiments, collect data, analyze and present data, finally, a publishable figure.</i></p> <p>Expectations of summer student- <i>During the internship, the student should have the motivation to learn, gathering knowledge, and hands-on experiences.</i></p>	<p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics; Tumor immunology & immunotherapy</p>	<p>My research interests focus on the role of sphingolipid mediators, sphingosine-1-phosphate (S1P), and ceramide-1-phosphate (C1P) in breast cancer progression and metastasis. We use patient-derived 3D cell models, molecular biology techniques, and genetic animal models to study sphingolipid mediators signaling in inflammation and cancer. We are also interested in identifying novel molecular targets and underlying mechanisms of actions for tumor metastases. Significant projects: i) to determine the role of S1P as a cofactor in regulating master transcription factors (HIFs, STATs, NF-κB) functions in tumor metastasis; ii) to determine the role of C1P/ceramide kinase in tumor metastasis; iii) to determine the role of sphingolipid mediators in the tumor microenvironment and metastasis. We have various small projects on the role of mediator signaling in the tumor microenvironment and metastasis suitable for students. Student can be a co-author for peer-review publications.</p> <p>Project phase: Validation- confirming previous data/results with a concentration on techniques, data interpretation and science reporting; potential for contributing to a scientific paper</p>
<p>Kathleen Kokolus</p> <p>Dept. of Immunology</p> <p>www.roswellpark.org/Kathleen-Kokolus</p> <p>Mentoring style- <i>I am present in the laboratory but would like students to learn to work somewhat independently by the end of the program.</i></p> <p>Expectations of summer student- <i>Students will be expected to work in a collaborative group interacting with graduate students, researchers, clinicians, and technicians. Students will need to follow directions, spend time reading about relative subjects, and be comfortable being involved in translational research.</i></p>	<p>Scientific Research</p> <p>Tumor immunology & immunotherapy</p>	<p>Exploring Ways to Mitigate Side Effects Caused by Cancer Drugs</p> <p>Many cancer drugs cause unwanted side effects and toxicities that negatively impact the quality of life of cancer survivors. In some cases, these toxicities may be so debilitating that patients may choose to forgo lifesaving treatment. This project will investigate combination therapy approaches, in vitro and in vivo settings, that could help mitigate side effects caused by cancer treatment.</p> <p>Project phase: Design- early stage development of experimental components/methodologies with a concentration on techniques</p>

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<p>Richard O'Connor</p> <p><i>Dept. of Cancer Prevention and Population Sciences</i></p> <p>www.roswellpark.org/Richard-O'Connor</p> <p>Mentoring style- <i>I allow and expect interns to work independently. I will set up weekly meetings to discuss goals and progress.</i></p> <p>Expectations of summer student- <i>I expect interns to produce high-quality work product in a professional manner. Interns should take direction and work on tasks diligently, and ask questions when unsure of how to proceed.</i></p>	<p>Scientific Research</p> <p>Cancer prevention and epidemiology; Regulatory Science</p>	<p>Consumer responses to flavored tobacco products</p> <p>Students will have the opportunity to participate in exciting ongoing research in tobacco regulatory science as a part of our Western New York Center for Research on Flavored Tobacco Products, one of 9 Tobacco Centers of Regulatory Science in the US. Interns will assist with data processing from several studies examining consumer's cognitive and sensory responses to flavored electronic cigarettes. Activities would include secondary analysis of existing datasets, observing data collection from ongoing studies, and helping to prepare materials for upcoming research studies.</p> <p>Project phase: Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>
<p>Mukund Seshadri</p> <p><i>Dept. of Oral Oncology/Dentistry and Maxillofacial Prosthetics</i></p> <p>www.roswellpark.org/Mukund-Seshadri</p> <p>Mentoring style- <i>Democratic but expect interns to be professional in their interactions and diligent with an outstanding work ethic.</i></p> <p>Expectations of summer student- <i>Motivated, willing to take ownership of the work</i></p>	<p>Scientific Research Clinical Research</p> <p>Cancer biophysics; Radiation Oncology; Cancer experimental diagnostics; Medical Oncology; Surgical Oncology; Oral Medicine; Cancer pharmacology and therapeutics; Cancer prevention and epidemiology</p>	<p>Developing novel combination strategies for oral cancer</p> <p>Research in my laboratory is focused on three main areas: (i) understanding the 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.</p> <p>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.</p> <p>Integrating AI/Machine Learning for Early Detection and Prognostication</p> <p>We are investigating the potential of integrating artificial intelligence (AI) and machine learning (ML) with imaging methods to determine if the diagnostic or prognostic performance of traditional imaging methods such as MRI, CT and US can be improved.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>

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<p>Gal Shafirstein</p> <p>Dept. of <i>Cell Stress Biology</i></p> <p>www.roswellpark.org/Gal-Shafirstein</p> <p>Mentoring style- <i>A teamwork that includes students, faculty and outside collaborators. Use weekly lab meetings for reporting results, presentation of new ideas. I have an open-door policy for research discussions as needed.</i></p> <p>Expectations of summer student- <i>Conduct experiments with supervision from graduate students in the lab. Document the work done. Record results. Present results and plans in our weekly lab meetings.</i></p>	<p>Scientific Research</p> <p>Photodynamic Therapy; Cancer biophysics; Surgical Oncology</p>	<p>Treatment Planning and Light Dosimetry in Photodynamic Therapy (PDT)</p> <p>My research team is focused on the development and implementation of treatment planning and light dosimetry in PDT. My group includes 1 pre-doctoral student, a post doctoral and a technician. We collaborate with physicians, and faculty with expertise in radiation biology, biostatistics, and imaging at Roswell Park, and drug developers at other research institutes. We do preclinical and clinical studies, and investigate combination therapies.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Anurag Singh</p> <p>Dept. of <i>Radiation Medicine</i></p> <p>www.roswellpark.org/Anurag-Singh</p> <p>Mentoring style- <i>Close oversight with concurrent exposure to the clinic</i></p> <p>Expectations of summer student- <i>40 hours of work per week including 2 days/week in clinic</i></p>	<p>Clinical Research</p> <p>Radiation Oncology; Cancer pharmacology and therapeutics</p>	<p>Clinical Research Project in Radiation Medicine</p> <p>The goal of our clinical research overall are to assess administration of radiation treatment regimens in relationship to survival outcomes. Projects involve existing data and chart review. Projects will vary for the summer program. Past project titles t</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Li Tang</p> <p>Dept. of <i>Cancer Prevention and Population Sciences</i></p> <p>www.roswellpark.org/Li-Tang</p> <p>Mentoring style- <i>I believe that teaching is to introduce but not to force-feed knowledge.</i></p>	<p>Scientific Research</p> <p>Cancer molecular epidemiology; Cancer prevention and epidemiology</p>	<p>Gene, Diet, and their interactions contributing to cancer characteristics and prognostic outcomes</p> <p>Our research program is engaged in molecular epidemiological study of cancer and is developed in two directions with a central theme of enhancing treatment efficacy and improving cancer prognosis. The first direction is to understand the role of gene-diet interaction in cancer prognosis and treatment outcome. The primary focus is on cruciferous vegetables and their key anti-cancer effectors, the phytochemical isothiocyanates. The second research direction is to understand the biological basis for cancer characteristics. The</p>

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<p>Expectations of summer student- <i>The expectation is that the summer student may be inspired and prepared to embark on the pursuit of careers in biomedical research.</i></p>		<p>particular interest is in genetic and epigenetic contributions to racial disparities in cancer aggressiveness. The goal is to target high risk population with specific lifestyle and/or dietary intervention approaches to decrease cancer mortality.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Lei Wei Dept. of Bioinformatics/Biostatistics www.roswellpark.org/Lei-Wei Mentoring style- <i>Flexible</i></p> <p>Expectations of summer student- <i>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.</i></p>	<p>Scientific Research Cancer bioinformatics</p>	<p>Characterize somatic mutations in cancer genomes 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.</p> <p>Project phase: Blank</p>
<p>Li Yan Dept. of Bioinformatics/Biostatistics www.roswellpark.org/Li-Yan Mentoring style- <i>Lead by example</i></p> <p>Expectations of summer student- <i>Self-motivated & Team player</i></p>	<p>Scientific Research Cancer bioinformatics; Cancer biostatistics; Tumor immunology & immunotherapy; Cancer genetics</p>	<p>Translational Bioinformatics; Computational Oncology We will offer a number of Translational Bioinformatics & Computational Oncology projects, leveraging our recently funded NCI Cancer Moonshot Immuno-Oncology Translational Network (IOTN, https://www.iotnmoonshot.org/).</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>