



## 2024 Mentor Directory: High School Summer Research Experience Program in Cancer Science

Mentor	Department	Research Projects	Pg
Dhyan Chandra	Pharmacology and Therapeutics	Mitochondrial Regulation of Cell Death and Resistance in Cancer	2
Maciej Goniewicz	Cancer Prevention and Population Sciences	Safety of electronic cigarettes	2
Richard O'Connor	Cancer Prevention and Population Sciences	Tobacco regulatory science	3
Gal Shafirstein	Cell Stress Biology	Image-Guided Treatment Planning and Dosimetry in Photodynamic Therapy with Targeted, Radiotherapy and Immunotherapy	3
Anurag Singh	Radiation Medicine	Clinical Research Project in Radiation Medicine	4
Li Tang	Cancer Prevention and Population Sciences	Gene, Diet, and their interactions contributing to cancer characteristics and prognostic outcomes	4
Lei Wei	Bioinformatics/Biostatistics	Characterize somatic mutations in cancer genomes	5
Karen Yeary	Cancer Prevention and Population Sciences	Two weight loss strategies for prostate cancer patients on active surveillance	5

Mentor	Research Areas	Project description
<p><b>Dhyan Chandra</b></p> <p>Dept. of <b>Pharmacology and Therapeutics</b></p> <p><a href="http://www.roswellpark.org/Dhyan-Chandra">www.roswellpark.org/Dhyan-Chandra</a></p> <p><b>Mentoring style-</b> Provide opportunities to brainstorm ideas. Encourage student to ask questions. Guide student to develop collaborative skills to understand scientific research project.</p> <p><b>Expectations of summer student-</b> 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.</p>	<p><b>Scientific Research</b></p> <p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics; Urology</p>	<p><b>Mitochondrial Regulation of Cell Death and Resistance in Cancer</b></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> <p><b>Project phase:</b> Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>
<p><b>Maciej Goniewicz</b></p> <p>Dept. of <b>Cancer Prevention and Population Sciences</b></p> <p><a href="http://www.roswellpark.org/Maciej-Goniewicz">www.roswellpark.org/Maciej-Goniewicz</a></p> <p><b>Mentoring style-</b> Meetings in person at least once a week to discuss progress and challenges in experiments. Weekly presentations to my lab team. Meetings</p>	<p><b>Scientific Research</b></p> <p>Cancer prevention and epidemiology; Public Health</p>	<p><b>Safety of electronic cigarettes</b></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><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

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<p><i>in person to discuss conference submission.</i></p> <p><b>Expectations of summer student-</b> <i>Conduct a pilot experiments. Collect the preliminary data. Prepare and submit at least one abstract for scientific conference or one manuscript for peer-reviewed journal.</i></p>		
<p><b>Richard O'Connor</b></p> <p><i>Dept. of Cancer Prevention and Population Sciences</i></p> <p><a href="http://www.roswellpark.org/Richard-O'Connor">www.roswellpark.org/Richard-O'Connor</a></p> <p><b>Mentoring style-</b> <i>I allow and expect interns to work independently. I will set up weekly meetings to discuss goals and progress.</i></p> <p><b>Expectations of summer student-</b> <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><b>Scientific Research</b></p> <p>Cancer prevention and epidemiology; Regulatory Science</p>	<p><b>Tobacco regulatory science</b></p> <p>Students will have the opportunity to participate in exciting ongoing research in tobacco regulatory science. Active projects include vaping topography, focus groups with tobacco user groups to explore attitudes toward novel products, understanding characteristics of cigarettes across time, identification and monitoring of emerging tobacco and nicotine products.</p> <p><b>Project phase:</b> Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>
<p><b>Gal Shafirstein</b></p> <p><i>Dept. of Cell Stress Biology</i></p> <p><a href="http://www.roswellpark.org/Gal-Shafirstein">www.roswellpark.org/Gal-Shafirstein</a></p> <p><b>Mentoring style-</b> <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><b>Scientific Research</b></p> <p>Photodynamic Therapy; Cancer biophysics; Surgical Oncology; Radiation Oncology; Medical Oncology</p>	<p><b>Image-Guided Treatment Planning and Dosimetry in Photodynamic Therapy with Targeted, Radiotherapy and Immunotherapy</b></p> <p>My research focuses on advancing the utilization of photodynamic therapy and chemophototherapy through novel computer modelling and the development of medical devices. Our expertise is in translating preclinical findings into clinical trials. Our novel technologies are currently being tested in four clinical trials, and we are in the process of supporting three more trials. We aim to improve treatment outcomes and quality of life in patients with advanced cancer in the lung and airway, head and neck, liver, breast, and colorectal cancer.</p>

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<p><b>Expectations of summer student-</b> <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><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>
<p><b>Anurag Singh</b> <i>Dept. of Radiation Medicine</i>  <a href="http://www.roswellpark.org/Anurag-Singh">www.roswellpark.org/Anurag-Singh</a>  <b>Mentoring style-</b> <i>Close oversight with concurrent exposure to the clinic</i>  <b>Expectations of summer student-</b> <i>40 hours of work per week including 2 days/week in clinic</i></p>	<p><b>Clinical Research</b>  Radiation Oncology; Cancer pharmacology and therapeutics</p>	<p><b>Clinical Research Project in Radiation Medicine</b> 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  <b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>
<p><b>Li Tang</b> <i>Dept. of Cancer Prevention and Population Sciences</i>  <a href="http://www.roswellpark.org/Li-Tang">www.roswellpark.org/Li-Tang</a>  <b>Mentoring style-</b> <i>I believe that teaching is to introduce but not to force-feed knowledge.</i>  <b>Expectations of summer student-</b> <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><b>Scientific Research</b>  Cancer molecular epidemiology; Cancer prevention and epidemiology</p>	<p><b>Gene, Diet, and their interactions contributing to cancer characteristics and prognostic outcomes</b> 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 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.  <b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

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<p><b>Lei Wei</b></p> <p>Dept. of <b>Bioinformatics/Biostatistics</b></p> <p><a href="http://www.roswellpark.org/Lei-Wei">www.roswellpark.org/Lei-Wei</a></p> <p><b>Mentoring style-</b> <i>Flexible</i></p> <p><b>Expectations of summer student-</b> <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><b>Scientific Research</b></p> <p>Cancer bioinformatics</p>	<p><b>Characterize somatic mutations in cancer genomes</b> 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><b>Project phase:</b> Blank</p>
<p><b>Karen Yeary</b></p> <p>Dept. of <b>Cancer Prevention and Population Sciences</b></p> <p><a href="http://www.roswellpark.org/Karen-Yeary">www.roswellpark.org/Karen-Yeary</a></p> <p><b>Mentoring style-</b> <i>Not a micro-manager and more hands-off; I am more than willing to give direction if mentee asks.</i></p> <p><b>Expectations of summer student-</b> <i>To be a productive member of our research team. To meet agreed upon tasks and goals. To be willing to ask questions and take initiative in learning.</i></p>	<p><b>Clinical Research</b></p> <p>Cancer prevention and epidemiology</p>	<p><b>Two weight loss strategies for prostate cancer patients on active surveillance</b> We will test two different types of weight loss strategies on prostate cancer patients on active surveillance. One weight loss strategy will be a gold-standard behavioral weight loss intervention, whereas the other will be an intermittent fasting interven</p> <p><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>