

## Table of Contents

Mentor	Department	Research Project	Pg.
Dhyan Chandra	Pharmacology and Therapeutics	Mitochondrial Regulation of Cell Death and Resistance in Cancer	1
Gokul Das	Pharmacology and Therapeutics	Mechanisms by Which Hormone Receptors and Tumor Suppressors Impact Cancer	2
John Ebos	Department of Medicine	Resistance and Metastasis Following Tumor Microenvironment Inhibition	3
Maciej Goniewicz	Urology Cancer Prevention and Population Sciences	Safety Of Electronic Cigarettes	4
Richard O'Connor	Cancer Prevention and Population Sciences	Consumer Responses To Flavored Tobacco Products	5
Gal Shafirstein	Cell Stress Biology	Treatment Planning and Light Dosimetry in Photodynamic Therapy (PDT)	6
Li Tang	Cancer Prevention and Population Sciences	Gene, Diet, And Their Interactions Contributing To Cancer Characteristics And Prognostic Outcomes	7
Yue Wu	Urology	Understanding Progression of Prostate Cancer to Castration Re-Current Disease	7
Anna Bianchi-Smiraglia	Cell Stress Biology	Metabolic Alterations in Cancer	8
Ethan Abel	Molecular and Cellular Biology	Epigenetic Targeting of Pancreatic Cancer Stem Cells	9
Nitai Hait	Molecular and Cellular Biology	Mechanisms by Which Sphingolipid Mediators Impact Tumor Progression and Metastasis	10

Mentor	Research Areas	Project Description
<p><b>Dhyan Chandra</b></p> <p><i>Dept. of Pharmacology and Therapeutics</i></p> <p><a href="http://www.roswellpark.org/Dhyan-Chandra">www.roswellpark.org/ Dhyan-Chandra</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> Yes</p> <p><b>Mentoring style-</b> <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><b>Expectations of summer student-</b> <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><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 understand the molecular basis of therapy resistance in multiple cancer types including in prostate, breast, pancreatic, 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, patient-derived models, 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.</p> <p><b>Project phase:</b> Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>

Mentor	Research Areas	Project Description
<p><b>Gokul Das</b></p> <p><i>Dept. of Pharmacology and Therapeutics</i></p> <p><a href="http://www.roswellpark.org/">www.roswellpark.org/</a> <b>Gokul-Das</b></p> <p><b>CSTEP Peer-to-Peer Program?</b> No</p> <p><b>Mentoring style-</b> <i>I motivate the students to think. Myself and senior people in the laboratory will discuss the project and guide you through the experiments on the bench. Students are encouraged to present their experimental data (whether the experiment succeeds or fail at times) at the weekly lab meetings. The lab meetings are semi-formal with all members participating in open discussions and brainstorming.</i></p> <p><b>Expectations of summer student-</b> <i>The student should be highly motivated and inquisitive and be willing to read research publications relevant to the topic of research. The student should attend the weekly laboratory meeting. The student should maintain detailed records of the laboratory experiments on a daily basis.</i></p>	<p><b>Scientific Research</b></p> <p>Cancer Genetics; Cancer Molecular and Cellular Biology; Cancer Pharmacology and Therapeutics</p>	<p><b>Mechanisms By Which Hormone Receptors And Tumor Suppressors Impact Cancer</b></p> <p>The research in Das lab focuses on understanding the cellular and molecular mechanisms of cancer, especially breast ,lung, and ovarian cancers and how to exploit them for developing new therapeutic strategies. For example, we are analyzing the role of hormone receptors (such as the estrogen receptor) and tumor suppressors (such as the p53 protein) in cancer onset and progression using cell culture and mouse tumor models. Summer projects will involve modern cellular and molecular biological techniques.</p> <p><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

Mentor	Research Areas	Project Description
<p><b>John Ebos</b> <i>Dept. of Medicine</i></p> <p><a href="http://www.roswellpark.org/John-Ebos">www.roswellpark.org/ John-Ebos</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> No</p> <p><b>Mentoring style-</b> <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><b>Expectations of summer student-</b> <i>Current lab members include late-stage PhD students who are exceptionally committed to their projects and represent model examples of work ethic and intellectual investment, so there is an excellent opportunity for strong mentorship by committed teachers. An ideal summer student is someone who can give their best effort to learn from these examples, and match the enthusiasm in the lab.</i></p>	<p><b>Scientific Research</b></p> <p>Cancer Molecular and Cellular Biology; Cancer Pharmacology and Therapeutics; Tumor Immunology &amp; Immunotherapy; Surgical Oncology; Cancer Genetics; Medical Oncology; Cancer Bioinformatics; Cancer Biostatistics</p>	<p><b>Resistance And Metastasis Following Tumor Microenvironment Inhibition</b></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><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

Mentor	Research Areas	Project Description
<p><b>Maciej Goniewicz</b></p> <p><i>Dept. of Cancer Prevention and Population Sciences</i></p> <p><a href="http://www.roswellpark.org/Maciej-Goniewicz">www.roswellpark.org/ Maciej-Goniewicz</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> Yes</p> <p><b>Mentoring style-</b> <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><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>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>

Mentor	Research Areas	Project Description
<p><b>Richard O'Connor</b> <i>Dept. of Cancer Prevention and Population Sciences</i></p> <p><a href="http://www.roswellpark.org/">www.roswellpark.org/</a> <b>Richard-O'Connor</b></p> <p><b>CSTEP Peer-to-Peer Program? No</b></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>Consumer Responses To Flavored Tobacco Products</b> 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><b>Project phase:</b> Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>

Mentor	Research Areas	Project Description
<p><b>Gal Shafirstein</b>  <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>CSTEP Peer-to-Peer Program? No</b></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>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>Scientific Research</b></p> <p>Photodynamic Therapy; Cancer Biophysics</p>	<p><b>Treatment Planning and Light Dosimetry in Photodynamic Therapy (PDT)</b></p> <p>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.</p> <p><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

Mentor	Research Areas	Project Description
<p style="text-align: center;"><b>Li Tang</b></p> <p style="text-align: center;"><i>Dept. of Cancer Prevention and Population Sciences</i></p> <p style="text-align: center;"><a href="http://www.roswellpark.org/Li-Tang">www.roswellpark.org/ Li-Tang</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> No</p> <p><b>Mentoring style-</b> <i>I believe that teaching is to introduce but not to force-feed knowledge.</i></p> <p><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 style="text-align: center;"><b>Scientific Research</b></p> <p>Cancer Molecular Epidemiology; Cancer Prevention and Epidemiology</p>	<p style="text-align: center;"><b>Gene, Diet, And Their Interactions Contributing To Cancer Characteristics And Prognostic Outcomes</b></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 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><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>
Mentor	Research Area	Project Description
<p><b>Yue Wu</b></p> <p><i>Dept. of Urology</i></p> <p style="text-align: center;"><a href="http://www.roswellpark.org/Yue-Wu">www.roswellpark.org/ Yue-Wu</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> No</p> <p><b>Mentoring style-</b> <i>I would like to mentor through active discussions, and would like the student to be able to bring their own questions to the discussions.</i></p> <p><b>Expectations of summer student-</b> <i>A summer student would be an active thinker, and has basic skills to manage PowerPoint and Excel.</i></p>	<p style="text-align: center;"><b>Scientific Research</b></p> <p>Cancer Molecular And Cellular Biology; Cancer Molecular Epidemiology; Cancer Pharmacology and Therapeutics; Cancer Prevention and Epidemiology; Cancer Bioinformatics; Cancer Genetics; Urology; Medical Oncology</p>	<p style="text-align: center;"><b>Understanding Progression of Prostate Cancer to Castration Re-Current Disease</b></p> <p>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.</p> <p><b>Project phase:</b> Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>

Mentor	Research Areas	Project description
<p><b>Anna Bianchi-Smiraglia</b> <i>Dept. of Cell Stress Biology</i></p> <p><a href="http://www.roswellpark.org/Anna-Bianchi-Smiraglia">www.roswellpark.org/ Anna-Bianchi-Smiraglia</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> No</p> <p><b>Mentoring style-</b> <i>Open door policy for any question, suggestion, issue, etc. Ready to lend a hand when needed but not constantly over people's shoulder. Promoting independence and critical thinking</i></p> <p><b>Expectations of summer student-</b> <i>To be curious about science and the work being performed. To be responsible and committed. To work with integrity and as a team <b>player</b>.</i></p>	<p><b>Scientific Research</b></p> <p>Cancer Molecular and Cellular Biology</p>	<p><b>Metabolic Alterations In Cancer</b> We have two projects running in the lab: the first one revolves around the role of GTP metabolic enzymes to support the growth and metastasis of triple negative breast cancer cells. The second one is investigating the role of the aryl hydrocarbon receptor in MYCN-amplified neuroblastoma.</p> <p><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

Mentor	Research Areas	Project Description
<p><b>Ethan Abel</b></p> <p><i>Dept. of Molecular and Cellular Biology</i></p> <p><a href="http://www.roswellpark.org/Ethan-Abel">www.roswellpark.org/ Ethan-Abel</a></p> <p><i>CSTEP Peer-to-Peer Program? Yes</i></p> <p><i>Mentoring style- As a new investigator, my mentoring approach is very hands-on. I typically go into great detail with trainees as to what the hypothesizes we are trying to answer are, what techniques we will use to answer it and why, and the actual principles behind the techniques. I typically demonstrate techniques first, followed allowing students to do techniques in supervised manner until they are proficient, but remain regularly within reach for experimental guidance, technical support, or anything else a student has questions regarding.</i></p> <p><i>Expectations of summer student- By the end of their time in the lab a summer student should be able to become proficient in a small number of routinely used techniques/approaches (generally 5 or less), and with guidance/supervision carry out a set of pre-designed experiments in a reproducible manner (at least 3 times) so that some conclusions regarding the questions behind the experiments can be confidently made (e.g. results support or refute the hypothesis). Students should gain a general/basic understanding of field the lab is in and the lab's overall research interests/goals and a solid understanding of why the experiments they are conducting are being done (e.g. what is their project about). I expect all trainees to be excited, hardworking, careful, honest, and mutually respectful so as to promote and maintain a collaborative work environment that conducts high-quality science at all times.</i></p>	<p><b>Scientific Research</b></p> <p>Cancer Molecular and Cellular Biology; Cancer Pharmacology and Therapeutics</p>	<p><b>Epigenetic Targeting Of Pancreatic Cancer Stem Cells</b></p> <p>Students will test the effects of drugs called BET-inhibitors on pancreatic cancer stem cells (PCSCs), which are a subtype of cancer cell that fuels the tumor, as well as the interplay between BET-inhibitors and proteins that drive PCSCs. Students will use human cancer cells as models, and utilize protein, RNA, and DNA analyses in their studies.</p> <p><b>Project phase:</b> Elements of all three (Design, Discovery, Validation)</p>

Mentor	Research Areas	Project description
<p><b>Nitai Hait</b></p> <p><i>Dept. of <b>Molecular and Cellular Biology</b></i></p> <p><a href="http://www.roswellpark.org/Nitai-Hait">www.roswellpark.org/ Nitai-Hait</a></p> <p><b>CSTEP Peer-to-Peer Program?</b> No</p> <p><b>Mentoring style-</b> <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><b>Expectations of summer student-</b> <i>During the internship, the student should have the motivation to learn, gathering knowledge, and hands-on experiences.</i></p>	<p><b>Scientific Research</b></p> <p>Cancer Molecular and Cellular Biology; Cancer Pharmacology and Therapeutics</p>	<p><b>Mechanisms By Which Sphingolipid Mediators Impact Tumor Progression And Metastasis</b></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-kB) 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><b>Project phase:</b> Validation- confirming previous data/results with a concentration on techniques, data interpretation and science reporting; potential for contributing to a scientific paper</p>