

2022 Mentor Directory: High School Summer Research Experience Program in Cancer Science

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<p>Ethan Abel</p> <p><i>Dept. of Molecular and Cellular Biology</i></p> <p>www.roswellpark.org/Ethan-Abel</p> <p>Mentoring style- <i>As a new investigator, my mentoring approach is very hands-on. I typically go into great detail with trainees as to what the hypotheses 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>Scientific Research</p> <p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics</p>	<p>Epigenetic targeting of pancreatic cancer stem cells 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>Project phase: Elements of all three (Design, Discovery, Validation)</p> <p>Expectations of summer student- <i>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>

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<p>Dhyan Chandra</p> <p>Dept. of <i>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 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>Project phase: Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>

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<p>Maciej Goniewicz</p> <p><i>Dept. of Cancer Prevention and Population Sciences</i></p> <p>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 conference or one manuscript for peer-reviewed journal.</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>Katerina Gurova</p> <p>Dept. of <i>Cell Stress Biology</i></p> <p>www.roswellpark.org/Katerina-Gurova</p> <p>Mentoring style- <i>I like to discuss with a student major concepts and puzzling questions and then allow student to read a learn and come back with questions. As a hand on experience I am ready to give all necessary instructions and examples but then allow student to do work independently.</i></p> <p>Expectations of summer student- <i>Be interested in science and cancer Understand major concepts of molecular and cellular biology be willing to work hard and learn a lot.</i></p>	<p>Scientific Research</p> <p>Cancer bioinformatics; Cancer biophysics; Cancer molecular and cellular biology; Cancer pharmacology and therapeutics</p>	<p>Comparison of chromatin organization and function between tumor and normal cells.</p> <p>Cancer is disease of uncontrolled proliferation. However, just proliferating cells are not so dangerous for an organism. The property which makes cancer dangerous or aggressive is an ability of cancer cells to endless adaptations. Aggressive cancer cells can change their phenotype easy and quickly what helps them to survive in almost any conditions. Traditionally we thought that genomic instability and high mutational rate were responsible for this. However, more and more data are accumulated that these changes of cancer phenotype are transitory and reversible, and therefore non genetic. We believe that specific state of cancer cell chromatin is responsible for this phenotypic plasticity (also known as epigenetic plasticity). We are trying to find what specific properties of chromatin underlie phenotypic plasticity of tumor cells and how they can be utilized for cancer treatment. Our goal is to compare normal and tumor cells chromatin to identify the mechanism enabling epigenetic plasticity of tumor cells. Projects include understanding of how chromatin stability is achieved in normal cells, how it is broken in tumor cells, what cellular factors are involved in chromatin stability regulation and maintenance and how we can use small molecules affecting chromatin stability for cancer treatment. This work include molecular biology experiments, biochemistry, cell culture and animal studies as well as bioinformatic approaches.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>

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<p>Nitai Hait</p> <p><i>Dept. of Molecular and Cellular Biology</i></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>Scientific Research</p> <p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics; Tumor immunology & immunotherapy</p>	<p>Mechanisms by which sphingolipid mediators impact tumor progression and metastasis</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>

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<p>Eugene Kandel</p> <p><i>Dept. of Cell Stress Biology</i></p> <p>www.roswellpark.org/Eugene-Kandel</p> <p>Mentoring style- <i>I am indebted to many people who provided me with research opportunities and nurtured my scientific exploits since my middle-school days to the present. I believe that my responsibility is to pay it forward. I am willing to share my time, knowledge and other resources with aspiring young scientists who are self-motivated, honest, eager to learn and ready to work for their goals.</i></p> <p>Expectations of summer student- <i>A self-motivated individual, interested in a career as a biomedical scientist and willing to invest more than a nominally required effort into this research opportunity. Intellectual curiosity, independent thought, perseverance and dependability are expected.</i></p>	<p>Scientific Research</p> <p>Cancer molecular and cellular biology; Cancer pharmacology and therapeutics; Cancer genetics</p>	<p>Cell stress response pathways as new therapeutic targets.</p> <p>We study cell stress responses in order to improve protection of normal cells and uncover vulnerabilities in cancers. We use cell culture, genetic engineering, pharmacological and biophysical treatment of mammalian cells, as well as biochemical analysis of cell functions and individual gene expression. Current topics of research include :</p> <ol style="list-style-type: none"> 1. Resistance and sensitivity to targeted therapies in melanoma and colon cancer. 2. The mechanisms of resistance to oxygen and nutrient deprivation in mammalian cells. <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>

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<p>Amanda Quisenberry <i>Dept. of Health Behavior</i></p> <p>www.roswellpark.org/Amanda-Quisenberry</p> <p>Mentoring style- <i>I am an interactive, involved mentor with a desire to share my work and motivate young investigators.</i></p> <p>Expectations of summer student- <i>The summer intern will be trained in using behavioral economic and eye tracking methodologies, how to collect quality data from human participants, and how to clean and organize data for analysis. The opportunity for data analysis and manuscript preparation exists based on interest and skill level.</i></p>	<p>Scientific Research</p> <p>Cancer prevention and epidemiology</p>	<p>Tobacco Product Consumption under Hypothetical Flavor Policy Environments Using Behavioral Economic and Eye Tracking Methods</p> <p>The goal of this project is to identify the behaviors of menthol smokers when various hypothetical tobacco flavor policies are enacted using the Experimental Tobacco Marketplace. Eye tracking methodology is enacted simultaneously, measuring objective attention to product components while purchasing under these conditions. Research tasks will include collecting and analyzing data with opportunity for manuscript preparation. Involvement in other ongoing studies of the behavioral economics of tobacco products is also possible.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Brahm Segal <i>Dept. of Medicine</i></p> <p>www.roswellpark.org/Brahm-Segal</p> <p>Mentoring style- <i>na</i></p> <p>Expectations of summer student- <i>na</i></p>	<p>Scientific Research</p> <p>Tumor immunology & immunotherapy</p>	<p>Innate Immune Responses in Ovarian Cancer</p> <p>Our lab is interested in innate immune responses in the tumor microenvironment (TME), with a focus on metastatic ovarian cancer. We observed that neutrophils (a type of white blood cell) recruited to the tumor microenvironment can impair the activation of T cells that is required for anti-tumor immunity. The scientific research project will be focused on learning about mechanisms that make neutrophils suppress T cells in the TME. The student will work under the supervision of a doctoral student. The goals for the student are to acquire basic knowledge about immune responses to tumor, to develop a specific hypothesis to test, and to help design and conduct experiments under the mentorship of the doctoral student. The student will learn basic lab skills from members of our lab, such as flow cytometry. The student will participate in our lab meetings and we encourage students to ask questions and present their data.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>

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<p>Gal Shafirstein</p> <p><i>Dept. of 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><i>Dept. of 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>

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<p>Joseph Skitzki</p> <p><i>Dept. of Immunology</i></p> <p>www.roswellpark.org/Joseph-Skitzki</p> <p>Mentoring style- <i>Drs. Fisher and Kim run the day to day lab activities and are excellent teachers, I will provide oversight and an opportunity to see my clinical practice of surgical oncology</i></p> <p>Expectations of summer student- <i>to be enthusiastic, to be proactive in their learning, and to develop as a learner</i></p>	<p>Scientific Research Clinical Research</p> <p>Tumor immunology & immunotherapy; Surgical Oncology</p>	<p>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</p> <p>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</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Pamela Sung</p> <p><i>Dept. of Pharmacology and Therapeutics</i></p> <p>www.roswellpark.org/Pamela-Sung</p> <p>Mentoring style- <i>I plan to meet one-on-one with a student on at least a weekly basis to discuss the project and ensure that the experience is catered to the student's educational goals. I believe in maintaining a good work-life balance and have no set hours that one "must" be in lab, so long as you continue to be productive.</i></p> <p>Expectations of summer student- <i>I expect students to be engaged in understanding the rationale behind the experiments and learn techniques to be able to perform them independently. Students will have their own project, but are welcome to be involved with other ongoing projects in the lab.</i></p>	<p>Scientific Research</p> <p>Cancer pharmacology and therapeutics</p>	<p>Novel therapies in Acute Myeloid Leukemia My laboratory focuses on a pathway (FLT3) that is frequently abnormal in acute myeloid leukemia (AML), which is a blood cancer affecting people of all ages. A drug targeting FLT3 was FDA approved recently. While it is effective, it is not curative. My goal is to better understand the biology of FLT3, so we can improve upon this therapy. We use a number of techniques including molecular biology, cell culture, flow cytometry, and mouse modeling. As a leukemia physician, I hope these studies will lead to clinical trials for AML.</p> <p>Project phase: Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>

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<p>Song Liu</p> <p>Dept. of <i>Biostatistics/Bioinformatics</i></p> <p>www.roswellpark.org/Song-Liu</p> <p>CSTEP Peer-to-Peer Program? Yes</p> <p>Mentoring style- <i>lead by example; team work</i></p> <p>Expectations of summer student- <i>self-motivated; team player</i></p>	<p>Cancer bioinformatics; Cancer genetics;Tumor immunology & immunotherapy</p>	<p>Cancer Bioinformatics for Immuno-Oncology As the sole data coordination center for the prestigious NCI Cancer Moonshot Immuno-Oncology Translational Network (IOTN, https://www.iotnmoonshot.org), we have a number of exciting cancer bioinformatics projects in the cutting edge field of immuno-oncology.</p> <p>Project phase: Elements of all three (Design, Discovery, Validation)</p>
<p>Mark Long</p> <p>Dept. of <i>Biostatistics/Bioinformatics</i></p> <p>www.roswellpark.org/Mark-Long</p> <p>CSTEP Peer-to-Peer Program? No.</p> <p>Mentoring style- <i>I would describe my mentoring style as laid-back but engaged. I will work directly with you and encourage you, but ultimately you will get out of this internship what you want to put into it.</i></p> <p>Expectations of summer student- <i>I expect a summer student to be involved, passionate and curious about computational biology and their research project. There must be some experience or enthusiastic willingness from the student to learn coding/programming (specifically R programming) as it will be a major focus of the internship.</i></p>	<p>Cancer bioinformatics; Cancer biostatistics</p>	<p>Application of bioinformatics approaches to cancer research The scientific research conducted through this internship will be heavily focused on the application of computational approaches to high-throughput cancer omics datasets. The work will include implementing approaches for handling the various steps of a typical data analysis including importation, tidying, statistical modeling, data visualization, and biological interpretation of results. The goals of the internship will be to learn the process of carrying out a typical bioinformatics project, understand the methodologies of the various steps involved, and ultimately be able to write scripts or tools (using the R programming language) to answer cancer related questions with big data. Experience with programming and/or biostatistics is highly beneficial for this internship, but not necessarily required.</p> <p>Project phase: Discovery- initial probing of scientific problem using established methods with a concentration on techniques, data analysis</p>

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<p>Li Tang</p> <p><i>Dept. of 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>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>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 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</p> <p><i>Dept. of Bioinformatics/Biostatistics</i></p> <p>www.roswellpark.org/Lei-Wei</p> <p>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</p> <p>Cancer bioinformatics</p>	<p>Characterize somatic mutations in cancer genomes</p> <p>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: n/a</p>