

2027 NSIP Mentors

[Aditi Banerjee](#)

Research Description & Primary Methods

My research is mainly focused on the pediatric brain tumors, medulloblastoma, the malignant brain tumor in children. Our lab investigates how tumor cells, and organoids grow, survive treatment, and communicate with their environment. We test promising drug and drug-delivery approaches that may improve therapy while reducing long-term side effects.

Cell Culture/Organoids, Molecular/Omics, Animal Models, Computational Biology, Data Science & AI, Clinical Studies/Clinical Trials, Imaging, High Throughput Screening;

[Daniel Bergman](#)

I use agent-based models (ABMs) to understand the dynamics of tumor-immune interactions in solid malignancies. Integrating with omics datasets, we are building patient-specific virtual models of cancer that can be used to predict tumor trajectory and response to therapy.

Computational Biology, Data Science & AI, Imaging, Molecular/Omics

[Cristiana Cairo](#)

I am a human immunologist with a primary research interest in T cell responses to pathogens of global health relevance in neonates and adults. The model cell population for our studies are human T cells, a subset of innate-like lymphocytes that respond rapidly to a broad range of microbes (including *P. falciparum*, *M. tuberculosis* and HIV). Our objective is to study the functional program of these lymphocytes in neonates and the impact of pathogen exposure before birth on the development of the infant immune system.

Molecular/Omics, Flow cytometry

[Curt Civin](#)

I study the cell and molecular biology of leukemias and normal hematopoietic stem-progenitor cells.

Cell Culture/Organoids, Molecular/Omics, Animal Models, Clinical Studies/Clinical Trials, Imaging

[Elizabeth Dennis](#)

My work focuses on lifestyle interventions to improve health and chronic disease related outcomes, particularly in older adults with multiple comorbid conditions. I currently have a few grants exploring

how virtual group nutrition education and cooking demos improve dietary quality, functional outcomes, and metabolic markers of health among older adults.

Community-Engaged Research

[Helen Dooley](#)

My team is developing novel shark-derived nanobodies as future cancer detection agents and therapeutics. We use a range of molecular biology, immunology, and protein engineering approaches to explore the potential of these nanobodies.

Cell Culture/Organoids, Molecular/Omics

[Alex Drohat](#)

We study DNA repair and how it corrects DNA damage that can cause mutations and lead to cancer, and how it functions in regulating DNA (cytosine) methylation, an epigenetic modification that regulates gene expression. We are also working to discover inhibitors of DNA repair enzymes, with the long-term goal of identifying compounds that could be used to treat cancer and provide research tools for studying the role of these enzymes in carcinogenesis.

Structural Biology, High Throughput Screening, Enzymology methods to study the mechanism and inhibition of repair enzymes

[Elana Fertig](#)

My lab develops computational models and AI techniques for biological research. We apply these technologies to understand how cancer develops and responds to therapy.

Molecular/Omics, Computational Biology, Data Science & AI

[Vivek Ganesh](#)

Neurava is developing industry leading AI-powered wearable technology to monitor multiple physiological signals to detect, alert and predict seizure and cardiorespiratory dysfunctions in patients with epilepsy, with potential future applications across sleep apnea, SIDS and other neurological conditions. The company is HQ'd in Baltimore in a new state of the art facility, where it not only develops but manufactures its units and will soon be FDA cleared.

Computational Biology, Data Science & AI, Clinical Studies/Clinical Trials, Real-World Data (EHR, Registries, Claims Data), Engineering, High Throughput Screening

[Arif Hussain](#)

The research involves the study of different molecular signaling pathways in various disease states of prostate cancer using pre-clinical models, to identify such pathways for combinatoric targeting to improve treatment outcome.

Cell Culture/Organoids, Molecular/Omics, Computational Biology, Data Science & AI, Clinical Studies/Clinical Trials, Real-World Data (EHR, Registries, Claims Data)

[Anthony Kim](#)

See faculty profile.

Cell Culture/Organoids, Animal Models, Imaging, High Throughput Screening

[Amber Kleckner](#)

I do clinical trials with human participants testing the effects of nutrition programs on symptom outcomes. We also explore underlying mechanisms of cancer-related fatigue to better leverage dietary programs to treat it.

Clinical Studies/Clinical Trials

[Ian Kleckner](#)

The Cancer Control Mind & Body Lab aims to understand how the body and brain produce subjective feelings, and to translate that knowledge into treatments that help patients with cancer feel better. Our current NCI- and ACS-funded research focuses on how cancer chemotherapy cause side-effects such as neuropathy and distress via basic and translational research, and how to treat these symptoms using exercise via local and multi-site clinical trials. We use methods from psychophysiology (measuring heartbeats, skin conductance), neuroimaging (fMRI), exercise science, and behavioral science with computational approaches honed from his backgrounds in physics and biophysics.

Computational Biology, Data Science & AI, Clinical Studies/Clinical Trials, Imaging, Real-World Data (EHR, Registries, Claims Data)

[Aikaterini Kontrogianni](#)

My research centers on the cytoskeleton as both a structural framework and a signaling mediator. Using muscle and breast epithelial cells as model systems, my group has pioneered the

molecular and functional characterization of obscurin and its binding partner, Myosin Binding Protein-C slow, in health and disease, spanning skeletal and cardiac myopathies to breast and pancreatic cancer.

Cell Culture/Organoids, Molecular/Omics, Animal Models, Imaging

[Vikas Kundra](#)

We work on three main topics: (1) Multifunctional nanoparticles for imaging and therapy, (2) Imaging of delivered genes for gene therapy and for imaging delivered cells, and (3) Imaging tumor response to therapy.

Cell Culture/Organoids, Molecular/Omics, Animal Models, Clinical Studies/Clinical Trials, Imaging

[Rena Lapidus](#)

My lab is called the Translational Laboratory Shared Resource (TLSR). We are a service lab in the Cancer Center that models cancer *in vitro* and *in vivo*. We modify cells by CRISPR and we support early Phase clinical trials. Typically, we pair with a clinical who would like to conduct preclinical studies. For several years, we have tested approved chemotherapies, targeted therapies, and/or novel agents in their cancer of interest.

Cell Culture/Organoids, Animal Models, Clinical Studies/Clinical Trials

[Yajie Liang](#)

Our lab develops ways to watch individual cells inside the living brain over time, using advanced fluorescence imaging. We apply this to understand how cells behave in brain tumor. The goal is to understand tumor heterogeneity to guide therapy.

Imaging, Animal Models, Molecular/Omics

[Bolgni Nagalo](#)

My research focuses on developing next-generation cancer therapies that use engineered viruses to selectively attack tumors and activate the immune system. We study how these viruses can remodel the tumor environment and work with other treatments, such as immunotherapy and radiation, to improve outcomes for difficult-to-treat cancers like pancreatic cancer.

Cell Culture/Organoids, Molecular/Omics, Animal Models, Computational Biology, Data Science & AI, Clinical Studies/Clinical Trials, Imaging, High Throughput Screening;

[Mustafa Ozcam](#)

Our lab investigates how the trillions of microbes living in the human gut shape immune responses from early life onward and how disruptions to this relationship can lead to allergic and inflammatory diseases, including some with cancer-relevant links. We use a combination of clinical cohort studies, high-throughput metagenomics, and cellular immunology to identify specific gut bacteria and their metabolites that either promote or disrupt immune tolerance. The ultimate goal is to harness these microbial insights to develop microbiome-based therapeutics that prevent or reverse dysregulated immune states.

Molecular/Omics, Computational Biology, Data Science & AI, Clinical Studies/Clinical Trials

[Ryan Pearson](#)

Our research focuses on designing biomaterials and nanoparticles that can control how the immune system responds to disease. We study how these materials interact with immune-cell metabolism and signaling, with the goal of developing new therapies for conditions such as cancer and inflammatory diseases.

Cell Culture/Organoids, Molecular/Omics, Animal Models, Imaging, Nanomedicine

[Darren Perkins](#)

We study the ways in which our immune system first "sees" developing tumors. Specifically, we want to understand how our immune system knows when cancer is happening in the body so it can respond appropriately.

Molecular/Omics, Cell Culture/Organoids, Computational Biology, Data Science & AI

[Feyruz V Rassool](#)

We study mechanisms in inducing synthetic lethality using DNA damage/repair inhibitor combinations. We also study reprogramming the cancer epigenome and immune tumor microenvironment to increase anticancer immune responses. We use genetically

engineered cancer, cells, organoids and syngeneic mouse models in our studies.

Computational Biology, Data Science & AI, Animal Models, Cell Culture/Organoids, Clinical Studies/Clinical Trials

[Aleah Roberts](#)

I study the molecular cell biology of B cells. We are interested in using advanced imaging methods to study endocytosis of the B cell receptor. We also study dysregulation of B cell receptor endocytosis in Lymphoma.

Cell Culture/Organoids, Imaging

[Mohammad Siddiqui](#)

We study how prostate and bladder cancer adapt metabolically to survive and grow. The lab is highly translational in nature, where we try to study tissues directly from humans and design interventions with high human clinical translational potential.

Cell Culture/Organoids, Molecular/Omics

[Giovannino Silvestri](#)

Our laboratory studies acute myeloid leukemia (AML), an aggressive blood cancer, with a focus on AML cells carrying the FLT3-ITD mutation. We investigate why these cells become resistant to targeted drugs and how the bone-marrow environment, such as low oxygen and changes in metabolism, affects treatment response. Our goal is to identify new treatment combinations and develop patient-derived 3D models to improve therapy.

Cell Culture/Organoids, Molecular/Omics

[Nevil Singh](#)

In healthy individuals, the immune system (including T and B cells) are able to detect threats to the body, including spontaneously arising pre-tumor cells, and eliminate them quickly. When this surveillance system fails and tumors do develop, critical cells of the immune system "refuse" to clear these chronic malignant growths. Our lab studies the basic biology of this refusal - i.e. what are the molecular and cellular mechanisms which stop T cells from clearing out chronic antigens in the body. We use cell culture and mouse model systems to study these processes.

Cell Culture/Organoids, Molecular/Omics, Animal Models,
Computational Biology, Data Science & AI, Imaging, High Throughput
Screening

[Pratyush Tiwary](#)

My lab combines artificial intelligence and physics-based computer simulations to understand how proteins and RNA change shape and interact with potential drugs. We use this knowledge to identify new routes for cancer and other disease treatment and understand why some drugs work while others lose effectiveness.

Computational Biology, Data Science & AI

[Kristen Varney](#)

As Co-director for the Structural Biology Shared Resource (SBSR) within the UMGCCC, I work with all structural biology techniques to help researchers use information derived from macromolecular structures at atomic resolution to understand the molecular basis of disease-causing cellular defects and to design drugs that mitigate such defects. We provide a “top-down” structural biology approach that includes (1) cryoEM, (2) X-ray crystallography, and (3) NMR spectroscopy. The data derived from these methods are highly complementary, and they facilitate structure-based drug design within the GCCC and the CBT, including those involving computer-aided drug design (CADD) methods.

Structural Biology, High Throughput Screening

[David Weber](#)

We study structure, function, and inhibition of therapeutically relevant disease targets.

Structural Biology, High Throughput Screening

[Gerald Wilson](#)

We study RNA-based mechanisms associated with cancer. Particular interests are how the activities of select RNA-binding proteins increase or decrease cancer aggressiveness, and how these factors might be targeted for the development of new therapies. In addition to fundamental biology research, we also design and perform high throughput screens to identify new compounds that might be developed into therapeutics.

[Min Yu](#)

Our research focuses on understanding molecular mechanisms that promote cancer metastasis. We utilize both *in vitro*, *in vivo*, and patient samples to investigate the tumor intrinsic and tumor microenvironmental regulations that promote metastatic capacity of the disseminated tumor cells.

Cell Culture/Organoids, Molecular/Omics, Animal Models

[Jia-Ray Yu](#)

We strive to understand how cancer cells hijack gene regulation machineries to facilitate cancer initiation and progression. We focus on analyzing how these protein machineries became derailed either through genetic mutations or non-genetic events in cancer cells. Importantly, we are developing new therapeutic interventions for these cancer-associated protein machineries.

Cell Culture/Organoids, Molecular/Omics, High Throughput Screening, Structural Biology