# MSTP Mentors

| Mentors by Department | PhD Programs | Rotation Students | MD-PhD Students (and alumni) | Research Description |
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| **Biochemistry** | | | | |
| Eckhard Jankowsky, PhD | Biochemistry | Nischay Rege | Sarah Venus | Single molecule enzymology (RNA helicases) & single molecule studies of ribonucleoprotein machinery (HCV replication and pre-mRNA splicing) |
| Hung-Ying Kao, PhD | Biochemistry | | | Mechanisms of the transcriptional control by diverse signaling pathways; molecular basis of human diseases related to transcriptional regulation |
| Focco van den Akker, PhD | Biochemistry | Nischay Rege | | Structural biology; infectious diseases/antibiotic resistance; cardiovascular diseases; small-molecule therapeutics design; cell signaling |
| **Biomedical Engineering** | | | | |
| A. Bolu Ajiboye, PhD | Biomedical Engineering | Morgan McGrath | Anisha Rastogi | Development and control of brain- computer-interface (BCI) technologies for restoring function to individuals who have experienced severely debilitating injuries to the nervous system, such as spinal cord injury and stroke |
| Eben Alsberg, PhD | Biomedical Engineering, Pathology | Zach Nevin, Peter Qiao | Dan Alt, Alexandra McMillan | Tissue engineering and regenerative medicine; innovative biomaterials and bioactive factor delivery vehicles; control of stem cell fate decision; mechanotransduction and the influence of mechanics on cell behavior and tissue formation; therapeutic angiogenesis |
| Jeffrey Capadona, PhD | Biomedical Engineering | | Sydney Song | Our lab will be at the forefront of research into materials-based solutions to overcome the barriers to intimately integrated neural interfaces. We are interested in developing materials which will seamlessly assimilate within the neural tissue to facilitate molecular level connections with individual neurons by mediating the inflammatory response and interacting with the normal cellular machinery. |
| Dominique Durand, PhD | Biomedical Engineering, Neuroscience, Physiology & Biophysics | Max Freeberg, Kabilar Gunalan, Bryan Benson, Sydney Song | (Tom Ladas, Sheela Toprani, Daniel Leventhal, Bill Stacey) | Neural engineering, neural prostheses, magnetic and electric stimulation of the nervous system, electrophysiology of epilepsy, computational neuroscience. |
| Robert Kirsch, PhD | Biomedical Engineering | Anisha Rastogi | | Mechanics and control of human movement |
| Zheng-Rong Lu, PhD | Biomedical Engineering | | Peter Qiao | Drug delivery and molecular imaging; novel targeted imaging agents for molecular imaging; novel MRI contrast agents; image-guided therapy and drug delivery; polymeric drug delivery systems; multi-functional delivery systems for nucleic acids |
| Anant Madabhushi, PhD | Biomedical Engineering | Awuri Asuru, Gavin Hanson, Jessica Scarborough | | Quantitative image analysis; Multi-modal, multi-scale correlation of massive data sets for disease diagnostics, prognostics, theragnostics: cancer applications. |
| Cameron McIntyre, PhD | Biomedical Engineering | | Kabilar Gunalan (Tom Foutz, Svjetlana Miocinovic) | We hope to improve deep brain stimulation (DBS) for the treatment of movement disorders and provide the fundamental technology necessary for the effective application of DBS to new clinical arenas. |
| Andrew Rollins, PhD | Biomedical Engineering | | | His current research interests include the development and application of advanced optics and photonics technologies for imaging and characterization of biological samples, with particular emphasis on detection of early disease and monitoring of therapy in human tissues and investigating embryonic development. His primary research interest includes the technique of OCT. |
| Nicole Seiberlich, PhD | Biomedical Engineering | | James Ahad | Advanced signal processing and data acquisition techniques for real-time MRI |

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| Anirban Sen Gupta, PhD | Biomedical Engineering | | DaShawn Hickman, Michelle Cruz | Our principal research focus is on Drug Delivery and Nanomedicine. It encompasses mechanistic understanding of biological and pathological phenomena at the cellular, sub-cellular and biomolecular levels, and utilizing this knowledge to create bioinspired therapeutic and diagnostic technologies to interrogate, support, or treat the various phenomena. |
| Samuel Senyo, PhD | Biomedical Engineering | | | The Senyo group is interested in fundamental mechanisms regulating the differential regenerative response to heart damage observed across species, across ages, and in distinct forms of injury. Dr. Senyo performs comparative studies using mammalian model systems, including human stem cells. |
| Horst von Recum, PhD | Biomedical Engineering | Anna Czapar, Anna Henry, Evelyn Ojo | | The research in our laboratory focuses on novel platforms for the delivery of molecules and cells. |
| David Wilson, PhD | Biomedical Engineering | Christian Anderson, Charlie Wang, Brian Fort | (Roee Lazebnik) | Biomedical image processing; digital processing and quantitative image quality of X-ray fluoroscopy images; interventional MRI. |
| Xin Yu*, ScD | Biomedical Engineering | Christian Anderson | Charlie Wang (Didi Goodnough) | * Not currently accepting MSTP students for rotation or PhD placement |
| **Cardiovascular Research Institute** | | | | |
| Mukesh Jain, MD | Physiology and Biophysics, Pathology | Anna Henry, Hana Russo, James Ignatz-Hoover, Jennings Luu | Nelson Hsieh, David Sweet, Liyan Fan | Transcriptional mechanisms governing cellular differentiation and function |
| **Center for Clinical Investigation** | | | | |
| Satya Sahoo, PhD | Epidemiology & Biostatistics | | | Biomedical Big data, medical informatics with focus on data integration and scalable computing, data-driven approaches to understand role of brain connectivity in epilepsy seizure networks |
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| James Spilsbury *, PhD, MPH | Epidemiology and Biostatistics, Clinical Translational Science | | | * Not currently accepting MSTP students for rotation or PhD placement |
| **Center for Global Health & Diseases** | | | | |
| James Kazura, MD | Immunology | | | Immunoregulatory mechanisms of pathogenesis; acquired resistance to infection; malaria |
| Christopher L King, MD, PhD | Immunology | Gloria Tavera | | T cell differentiation, Malaria Schistosomiasis, Filariasis Neonatal immunity, IgE regulation Mechanisms of acquired immunity |
| **Center for Proteomics & Bioinformatics** | | | | |
| Mark Chance, PhD | Genetics, Systems Biology and Bioinformatics, Immunology | Dan Jindal | Danica Wiredja, Awuri Asuru (Vishal Patel) | Systems Biology, Protein Structure/Function, Cancer, Diabetes |
| **Center for RNA Molecular Biology** | | | | |
| Kristian Baker, PhD | Biochemistry | | | Post-transcriptional regulation of gene expression; mRNA turnover; RNA quality control; non-coding RNA function |
| Jeffery Coller, PhD | Biochemistry | | Gavin Hanson, Otis Pinkard | Work in the Coller lab focuses on the destruction of messenger RNA (mRNA). mRNA decay ensures that previously transcribed messages do not translate indefinitely. The spectrum of decay rates is achieved via the interplay between three fundamental principles. First, mRNA decay is the default state; all messages will succumb. Second, RNA degradation is intimately connected to protein synthesis; a message that translates better is more stable and vice versa. Third, stabilization requires the mRNA be maintained in an ideal ribonucleoprotein context (mRNP); deviants are destroyed. The long term focus of my lab is to understand how these three principles interconnect and are regulated by the cell to forge the cellular mRNA landscape. |

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| Donny Licatalosi, PhD | Biochemistry, Systems Biology and Bioinformatics | Susie Suh | Xinrui Zhang | The major goal of my lab is to understand how different RBPs regulate gene expression during mouse spermatogenesis. Research in the lab will combine genetic, bioinformatic, biochemical, and high throughput methods to generate transcriptome-wide maps of RBP-RNA interactions and mRNA regulation in specific spermatogenic cell types (from stem cell to gamete). |
| **Chemistry** | | | | |
| Blanton Tolbert, PhD | Molecular Virology | Erin Cohn | | Understanding the molecular mechanisms RNA viruses use to express their genomes |
| **Cleveland Clinic Biomedical Engineering, Concussion Center** | | | | |
| Jay Alberts, PhD | Biomedical Engineering | Bryan Benson | Morgan McGrath | How the brain controls skilled movements and how changes in brain function affect the movement performance; Parkinson's disease, stroke and concussion; improving movement and cognitive performance; concussion and mild dramatic brain injury |
| **Cleveland Clinic Cancer Biology** | | | | |
| Nima Sharifi, MD | Pharmacology | | | Metabolic and molecular mechanisms of resistance to hormonal therapy in advanced prostate cancer |
| **Cleveland Clinic Cellular and Molecular Medicine** | | | | |
| Stanley Hazen, MD, PhD | Cell Biology, Pathology | Awuri Asuru | Marc Ferrell (Arundhati Undurti, Bob Koeth) | Research description: inflammation biology, atherosclerosis, gut flora, asthma, HDL structure/function, internal medicine, preventive cardiology |
| Justin Lathia, PhD | Cancer Biology | | | Our two main areas of interest involve using in vivo imaging models to interrogate the tumor microenvironment and examining communication mechanisms used by cancer stem cell to promote their maintenance. Currently our work is focused on malignant brain tumors but our technology and interests are applicable to many other tumor types. |
| Jonathan Smith, PhD | Pathology | | | We apply cell/molecular biology, biochemistry, and genetics/genomics to study three areas related to cardiovascular disease: atherosclerosis, reverse cholesterol transport, and atrial fibrillation. |
| **Cleveland Clinic Genomic Medicine Institute** | | | | |
| Charis Eng, MD, PhD | Genetics, Cancer Biology | Ryan Gimple | | Cancer genomic medicine translational research. Characterization of disease risks in inherited predisposition to cancer. Intracytoplasmic trafficking of PTEN and oxidative stress in cancer |
| **Cleveland Clinic Hematology & Medical Oncology** | | | | |
| Jacob Scott, MD, DPhil | Systems Biology and Bioinformatics | Jessica Scarborough | | "Nothing in biology makes sense except in the light of evolution" applies as much in the clinic as anywhere else. The difference is that our efforts to treat cancer and infectious diseases both speeds up, and direct evolution of the malady to higher fitness peaks than would be achieved in natural settings. Rather than focusing on individual mutation, we use a combination of mathematical models, experimental evolution and data science to study the process of the evolution of resistance itself. |
| **Cleveland Clinic Immunology** | | | | |
| Robert Fairchild, PhD | Immunology | Alex Tong, Claire Mazahery, Otis Pinkard | (Tarek El-Sawy, Chuck Su, Austin Schenk, Josh Rosenblum, David Yao) | T-lymphocyte tolerance, transplantation immunology; T-cell mediated responses in the skin |
| Xiaoxia Li, PhD | Immunology | Leo Kim, Joseph Rathkey, Susie Suh, Brendan Barton, Muta Abiff | Willie Miller-Little (Brad Martin, Ling Wu) | Signal transduction in innate and adaptive immunity |
| Booki Min, DVM, PhD | Immunology | Ryan Stultz | | T cell homeostasis, gd T cells, CD8 T cells, Role of basophils in adaptive immunity |
| **Cleveland Clinic Molecular Genetics and Virology** | | | | |
| Ganes Sen, PhD | Biochemistry, Molecular Virology, Immunology | Nelson Hsieh | (Lenette Lu, Chris Elco) | Molecular Virology, Mechanism of Interferon Action, Recombinant DNA Technology, Genetic Regulation of Hypertension |

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| **Cleveland Clinic Pathobiology** | | | | |
| Laura Nagy, PhD | Nutrition, Cell Biology, Molecular Medicine | | Jeanette Wat | Innate immune contributions to alcohol and non-alcoholic induced liver injury, mechanisms of hepatocyte cell death, adipose-gut-liver interactions in alcoholic liver disease, genetic contributions to ALD |
| **Cleveland Clinic Stem Cell Biology and Regenerative Medicine** | | | | |
| Jennifer Yu, MD, PhD | Cancer Biology | | | Glioblastoma is the most common primary brain tumor and is fatal despite maximal therapy. Glioma stem cells (GSCs) are a subpopulation of cells that contribute to tumor progression. Our lab is focused on understanding mechanisms underlying key GSC tumorigenic properties with a long-term goal of uncovering potential therapeutic targets. |
| **Computer Science and Engineering** | | | | |
| Mehmet Koyutürk, PhD | Systems Biology and Bioinformatics | Danica Wiredja, Stevephen Hung | | Bioinformatics and Computational Biology, with emphasis on development of algorithms for data analysis in Systems Biology |
| **Dermatology** | | | | |
| Daniel Popkin, MD, PhD | Pathology | | | Our lab addresses fundamental questions in two related fields: viral pathogenesis and immunology. We apply this towards disease models (e.g. skin disease). |
| **Family Medicine & Community Health** | | | | |
| Kurt Stange, MD, PhD | Epidemiology & Biostatistics, Clinical Translational Science | | Uriel Kim | The generalist function, primary care practice, practice-based research, cancer prevention and early detection, multimethod research, health promotion, disability prevention, preventive service delivery in primary medical care. |
| **General Medical Sciences (Oncology)** | | | | |
| Jill Barnholtz-Sloan, PhD | Epidemiology and Biostatistics | | Peter Liao | Cancer genetic/molecular epidemiology, biostatistics, bioinformatics, systems biology, brain tumors |
| William Schiemann *, PhD | Cancer Biology, Pharmacology | Nathaniel Robinson | Alex Gooding, Nathaniel Robinson | * Not currently accepting MSTP students for rotation or PhD placement |
| **Genetics & Genome Sciences** | | | | |
| Yan Li, PhD | Genetics & Genome Sciences | | | Functions of non-coding cis-regulatory elements (such as enhancers) in development and complex diseases, especially related to diabetic conditions |
| Ashleigh Schaffer, PhD | Genetics & Genome Sciences | Soon Yi | | Our laboratory is primarily interested in understanding the unique functions of ubiquitously expressed proteins in human brain development and pediatric neurological disease. |
| Drew Adams, PhD | Genetics and Genome Sciences | Joel Sax | Zita Hubler | The Adams lab uses high-throughput screening and other chemical biology approaches to identify and optimize new drug candidates in neurodegenerative diseases, cancer, and other diseases. |
| Ann Harris, PhD | Genetics and Genome Sciences | Anniya Gu | | Tissue-specific and temporal regulation of gene expression; analysis of cis-regulatory elements and the role of 3D chromatin structure and modifications in regulating transcription; functional genomics of epithelial cells with a focus on cystic fibrosls |
| Peter Harte, PhD | Genetics | Meredith Whitney | | Epigenetic regulation of chromatin structure and transcription, histone modifying enzymes, Polycomb silencing, genetic control of lifespan and aging |
| Thomas LaFramboise, PhD | Genetics | Andrea Cohen, Evelyn Ojo, Danica Wiredja, Kathleen Plona, Andrew Morton | | Developing and applying computational tools to identify molecular variants - both inherited and somatic - that contribute to cancer and related diseases in humans |
| Hua Lou, PhD | Genetics | | | Alternative RNA processing and its role in cancer development |
| Peter Scacheri, PhD | Genetics, Cancer Biology | Steve Chirieleison, Stevephen Hung, Ellen Hong | Andrea Cohen, James Morrow, Andrew Morton | Investigation of the epigenetic code in human health and disease |

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| Paul Tesar, PhD | Genetics | Sarah Taylor, Kevin Allan | Matt Ellitt, Tyler Miller, Zach Nevin, Kevin Allan | Stem cell pluripotency and differentiation; developmental neurobiology; developmental genetics |
| Zhenghe John Wang, PhD | Genetics, Cancer Biology | George Luo | | Identifying novel genetic alterations, such as somatic mutations, gene amplifications and deletions, which alter critical gene functions involved in development of colon and gastric cancers |
| Anthony Wynshaw-Boris, MD, PhD | Genetics and Genome Sciences | Avery Sears, Michael Babinchak, Zita Hubler, Kathleen Plona | | Understanding genetic and biochemical pathways important for the development and function of the mammalian central nervous system, primarily using mouse models of human and mammalian diseases to define pathways disrupted in these diseases |
| **Medicine** | | | | |
| Isabelle Deschênes, PhD | Biomedical Engineering, Physiology and Biophysics | Liyan Fan | (Malcolm Hoshi) | We study the fundamental molecules that underlie the electrical function of the heart, including the cardiac sodium channel. We utilize molecular and electrophysiological techniques to study the structure-function of the sodium channel. We also do translational research to understand the role cardiac ion channels play in inherited cardiac arrhythmias. |
| **Medicine (Cardiovascular Medicine)** | | | | |
| Andrei Maiseyeu, PhD | Biomedical Engineering | | | Our research team develops nanotechnology tools to better understand cardiometabolic diseases such as atherosclerosis, type 2 diabetes, and obesity. We engineer, make, and test new imaging probes, drug delivery vehicles, and sensors that help diagnose and treat these conditions. |
| Aaron Proweller, MD, PhD | Cell Biology | Alex Gooding, Colin Stomberski | | Molecular pathways regulating vascular development and morphogenesis including the role of Notch signaling in patterning, maturation and contractile function of the arterial vasculature |
| Diana Ramírez-Bergeron, PhD | Genetics, Pathology | | Anna Henry | Adaptive responses to changes in oxygen tension and the effect on blood cells and vessels; influence of hypoxic responses on the generation of cardiovascular stem/progenitor cells and their differentiation into various cardiovascular cell lineages; hypoxia and bone marrow stem cell niches |
| **Medicine (Gastroenterology and Hepatology)** | | | | |
| Fabio Cominelli, MD, PhD | Pathology | | Adrian Gomez- Nguyen | Crohn's Disease, General GI, Inflammatory Bowel Disease, Ulcerative Colitis. |
| **Medicine (Hematology and Oncology)** | | | | |
| Sanford Markowitz, MD, PhD | Molecular and Microbiology, Genetics, Cancer Biology | Alexandra McMillan, James Morrow, Michal Jandzinski | (Josh Friedman, Ryan Fecteau) | Colon cancer genetics |
| Shigemi Matsuyama, DVM, PhD | Pharmacology, Cancer Biology | Alex Tong | | Cancer Cell Biology, Cell Death Regulation, Cell Penetrating Peptide |
| Reshmi Parameswaran, PhD | Immunology, Cancer Biology | | Yorleny Vicioso | I am a cancer biologist working on novel therapeutic approaches for cancer. I focus on ways to activate natural killer cells for adoptive therapy of pediatric cancers, and on developing therapeutic tools combining immunology with glycobiology, exploiting the cancer cell specific immune receptors and glycan expression patterns. |
| Stanton Gerson, MD | Cancer Biology | Kevin Allan | (Lachelle Weeks) | Transgenic mice and carcinogenesis, retroviral gene therapy, DNA repair, hematopoietic stem cells |
| **Medicine (Infectious Diseases)** | | | | |
| Robert A Bonomo, MD | Pharmacology, Molecular and Microbiology, Immunology | Emma Schroder | (Jodi Thomson, Sarah Drawz, Marisa Winkler) | Structure function studies of beta-lactamases; enzymological factors that permit the successful evolution of beta-lactamases in the clinic; development of immunological tools to study beta-lactamase expression in enteric bacilli; application of molecular diagnostics to the rapid diagnosis of infectious diseases; testing and development of novel beta-lactams and beta-lactamase inhibitors |

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| W Henry Boom, MD | Immunology, Molecular Biology and Microbiology | | (Mursalin Anis, Erika Noss) | T cell biology, tuberculosis, immune evasion, pulmonary host defense, antigen processing, anti-microbial immunity, basic and translational TB research. |
| David Canaday, MD | Immunology | Heather Clark, Gloria Tavera | | My lab studies the immunology of infectious diseases. My federally funded project currently is the study of HIV-TB interaction with a specific focus on cellular interactions that result in loss of control of M. tuberculosis. The second focus of the lab is on understanding the immune defects that develop with aging. |
| Michael Lederman, MD | Molecular and Microbiology, Pathology | | | Mechanisms of immune deficiency and immune restoration in HIV infection |
| Carlos Subauste, MD | Immunology | | | Immunology, cell signaling in host-pathogen interactions, Toxoplasma, HIV, autophagy, selective blockade of CD40 signaling to control disorders such as atherosclerosis and microvascular complications of diabetes |
| **Medicine (Institute for Transformative Molecular Medicine)** | | | | |
| Jonathan Stamler, MD | Biochemistry | Steve Chirieleison | Colin Stomberski | Our focus is on molecular, cellular and physiological aspects of redox biology, in particular the functions of nitric oxide in cellular signaling, and the roles of dysregulated redox mechanisms in human disease. |
| **Molecular Biology and Microbiology** | | | | |
| Susan Brady-Kalnay*, PhD | Molecular and Microbiology, Neuroscience, Cell Biology, Cancer Biology | | (Adam Burgoyne, Jullia Rosdahl) | * Not currently accepting MSTP students for rotation or PhD placement |
| Jonathan Karn, PhD | Molecular Biology and Microbiology | | | Control of Gene Expression in HIV |
| Alan Levine, PhD | Molecular Virology; Immunology; Pharmacology; Cell Biology; Cancer Biology | James Ignatz-Hoover, Ryan Stultz | Claire Mazahery (Robin Jump, Brenda Rivera- Reyes, Charlotte Chung, Andrew Schade) | Immune regulation in the mucosa: Role of the mucosal T lymphocyte and epithelial cell in intestine |
| Liem Nguyen, PhD | Molecular Biology and Microbiology | | | Host-mycobacterial interactions; virulence factors of Mycobacterium tuberculosis; antibiotic resistance and cell biology of mycobacteria |
| Arne Rietsch, PhD | Molecular Biology and Microbiology | | Emma Schroder | We study the primary virulence factor of P. aeruginosa, its type III secretion system, which is a molecular syringe that the bacterium uses to inject proteins into host cells. We are interested in understanding how this nanomachine works, as well as how the injected effector proteins prevent clearance of the bacterium by the patient's immune system. |
| Jacek Skowronski, MD, PhD | Molecular Biology and Microbiology | Abner Murray | | Our recent efforts have been broadly aimed to identify cellular co-factors of HIV/SIV-encoded proteins, as well as of selected cellular proteins that can block HIV replication. |
| **Neurological Surgery** | | | | |
| Eli Bar, PhD | Neurosciences, Pathology, Pathology/Cancer, Molecular Biology & Microbiology | | | Identification and targeting of cancer cell intrinsic signaling nodes in Glioblastoma |
| **Neurosciences** | | | | |
| Heather Broihier, PhD | Neuroscience | | Dan Jindal | Developmental neurobiology; Molecular mechanisms of synaptic development and plasticity |
| Evan Deneris, PhD | Neuroscience | | Meredith Whitney | Molecular genetics of the brain serotonergic transmitter system |
| Polyxeni Philippidou, PhD | Neuroscience | | Alicia Vagnozzi | Molecular mechanisms of neural circuit assembly during development, genetic control of phrenic motor neuron identity; synaptic specificity in respiratory circuits; Hox genes |
| Jerry Silver, PhD | Neuroscience | Paul Cheng, Sydney Song, Elliot Choi | (Teresa Evans, Michael Fitch) | Role of glial cells in development and regeneration of neural circuits, nerve regeneration, glia, axon guidance |
| Benjamin Strowbridge, PhD | Neuroscience | | (Phil Larimer, Robert Hyde, Elisa Chiang, Ramani Balu) | Synaptic Physiology, hippocampus, olfactory bulb, Computational Neuroscience |
| Wen-Cheng Xiong, MD, PhD | Neuroscience | | | Molecular mechanisms underlying neural development, neuro-degeneration, and bone homeostasis |

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| Richard Zigmond, PhD | Neuroscience, Pathology | Xinrui Zhang, Willie Miller-Little | Aaron Talsma | My laboratory studies plasticity in the adult nervous system. We are interested in the ways in which the chemistry of the adult nervous system can change and the functional consequences of such changes. We focus particularly on alterations that occur in response to (1) neural damage and (2) changes in the neural activity. |
| **Nutrition** | | | | |
| Danny Manor*, PhD | Nutrition, Pharmacology, Pathology, Cancer Biology | Kirkland Wilson | | * Not currently accepting MSTP students for rotation or PhD placement |
| **Ophthalmology & Visual Sciences** | | | | |
| Paul Park, PhD | Pharmacology | | | Mechanism of action of rhodopsin and other G protein-coupled receptors |
| Irina Pikuleva, PhD | Pharmacology | Jennings Luu | | Mechanistic studies of the link between disturbed retinal cholesterol homeostasis and vascular retinal abnormalities; pharmacologic stimulation of cholesterol turnover in the brain to enhance memory and cognition and treat early stages of Alzheimer's disease |
| **Orthopedics** | | | | |
| Edward Greenfield*, PhD | Physiology and Biophysics, Pathology, Immunology, Cancer Biology | | Brian Fort | * Not currently accepting MSTP students for rotation or PhD placement |
| Ronald Triolo, PhD | Biomedical Engineering | Bryan Benson, Peter Liao | Max Freeberg | Rehabilitation engineering, neural control of motion, lower-extremity neuroprostheses, orthopaedic biomechanics and prosthetic/orthotic design |
| **Otolaryngology** | | | | |
| Brian McDermott, PhD | Genetics, Neuroscience, Biology | Jiayang Li, Kathleen Plona, Jeanette Wat | | Sensory Neurobiology, Hearing and Deafness, Zebrafish Genetics, Mechanotransduction, Synapse development, Translational Neuroscience |
| Qing Zheng, MD | Genetics | | | Genes, molecular pathways and drug discovery involved in disease processes in mouse models of human deafness, including Otitis Media (OM) and Usher syndrome |
| **Pathology** | | | | |
| Derek Abbott, MD, PhD | Pathology, Cancer Biology, Immunology | James Ignatz-Hoover, Michelle Cruz, Otis Pinkard, Hannah Kondolf | Steve Chirieleison, Bowen Zhou, Joseph Rathkey | Inflammatory diseases and innate immune signaling pathways |
| Stanley Adoro, PhD | Pathology/ Cancer, Immunology | | | Hematopoiesis, hematopoietic stem cells, acute myeloid leukemia, T-cell homeostasis and autoimmunity |
| Brian Cobb, PhD | Immunology | Ling Wu, Heather Clark, Claire Mazahery | | Antigen processing and presentation of carbohydrate antigens |
| Clifford Harding, MD, PhD | Immunology | Leo Kim, Claire Mazahery, David Sweet | (Alyssa Johnsen, Michael Drage, Rose Chu-Beck, Steve Potter, Aaron Tobian, Tom Richardson, Nicole Pecora, Daimon Simmons) | Immunology, major histocompatibility complex (MHC) molecules, antigen processing, function of antigen presenting cells and T cells, Toll-like receptors, vaccine adjuvants, Cell Biology, phagocytosis, endocytosis, subcellular fractionation, Infectious Disease, mycobacteria, tuberculosis |
| Mark Jackson, PhD | Cancer Biology | | Courtney Bartel | The Jackson laboratory focuses on genetic events that contribute to breast hyperplasia. |
| Qingzhong Kong, PhD | Pathology | | | Prion diseases, functions of cellular prion protein in biology and diseases, muscle stem cells, and gene therapy |
| M. Edward Medof, MD, PhD | Pathology | | | Intrinsic cell surface regulators: decay-accelerating factor (DAF or CD55), membrane cofactor protein (MCP or CD46), and membrane inhibitor of reactive lysis (MIRL or CD59) |
| Vincent Monnier, MD | Pathology, Biochemistry | | | Molecular mechanisms of protein aging, oxidative stress, complications of diabetes and aging, cataractogenesis, microbial enzyme technology |

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| Parameswaran Ramakrishnan, PhD | Immunology | Brendan Barton, Willie Miller-Little | | Dr. Ramakrishnan's lab focuses on diabetes and inflammation-induced cancer. Areas of interest include NF-kappaB related signal transduction in the immune system, metabolism and cancer. We use cellular systems, molecular biology and animal models, with the aim of identifying fundamental mechanisms and potential therapeutic targets. |
| Jiri Safar, MD | Pathology | | | Neurodegenerative diseases caused by protein misfolding; molecular basis of prion diseases; role of small oligomers of misfolded proteins in pathogenesis; translational medicine. |
| Lewis Shi, MD, PhD | Pathology | | | Understanding the mechanisms of how immune signaling pathways, metabolic processes, and transcriptional factors impact the maintenance, survival and functions of T cells in anti-tumor immunity |
| Alan Tartakoff*, PhD | Pathology | Kathleen Plona, Bowen Zhou | (Serendipity Rinonos, Jerrold Turner) | * Not currently accepting MSTP students for rotation or PhD placement |
| David Wald, MD, PhD | Pathology, Cancer Biology, Immunology | Ryan Gimple | James Ignatz- Hoover, Evelyn Ojo | Identification and development of novel therapeutic strategies for cancer with a particular focus on Acute myeloid leukemia (AML) |
| Xinglong Wang, PhD | Pathology | | | My research interest is to understand the mechanism(s) underlying neuronal death in various major neurodegenerative diseases with a focus on Alzheimer's disease, Frontotemporal dementia and Amyotrophic lateral sclerosis Frontotemporal dementia. |
| T. Sam Xiao, PhD | Pathology | | | The Xiao lab uses structural and biochemical approaches to study important immune receptors with the goal of understanding and modulating their functions for diagnostic and therapeutic applications. |
| Lan Zhou, MD. PhD | Cancer Biology | Peter Qiao, Yorleny Vicioso | | My research focuses on Notch-dependent regulation of hematopoietic stem cell proliferation, differentiation and niche location. Other interests include leukemia microenvironment regulation, Notch signaling in solid tumor progression, and fucosylated glycans in hematopoiesis and cancer biology. |
| Xiongwei Zhu, PhD | Pathology | Aaron Talsma, Muta Abiff | Sirui Jiang | Neurodegenerative mechanisms underlying Alzheimer disease and other neurodegenerative diseases |
| **Pediatrics** | | | | |
| Mitchell Drumm, PhD | Genetics & Genome Sciences | | Kathleen Plona | Understanding how variants in the genome influence the course of disease for CF patients and how the CF genome adapts to the disease |
| Thomas Gerken, PhD | Biochemistry | | | Protein structure and dynamics; NMR techniques; molecular modeling of glycoproteins and mucins |
| Alex Huang, MD, PhD | Cancer Biology, Immunology | Ryan Stultz, Derek Wong | Dixon Dorand, Alex Tong, Bryan Benson, Muta Abiff | Tumor Immunology; Intravital two-photon laser scanning microscopy; T cell and chemokine receptor biology; Cellular trafficking, migration and interaction in inflammation, cancer and auto-immunity |
| John Letterio, MD | Biochemistry | Brendan Barton | George Luo | The major focus of our work is on the discovery of the critical roles of TGF-ß in hematopoietic and immune cell function. |
| **Pharmacology** | | | | |
| Chris Dealwis, PhD | Pharmacology | | | Understanding the structural organization requirements by multiple protein assemblies to facilitate biological function |
| Maria Hatzoglou, PhD | Nutrition, Pharmacology | | | Arginine metabolism, gene regulation, viral receptors and gene therapy |
| Ruth Keri, PhD | Pharmacology, Cancer Biology | Hana Russo, Meredith Whitney, Pam Marcott, Syrena Bracey | Bryan Webb, Katrina Piemonte (Jonathan Mosely, Marjorie Montanez- Wiscovich) | Hormonal control of mammary gland development and construction of transgenic mouse models of breast cancer; functional genomics of mammary gland development and cancer. |

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| Jason Mears, PhD | Pharmacology | Sirui Jiang | | Molecular machinery associated with mitochondrial division in yeast and mammalian cells; understanding the relationship between mitochondrial dynamics and disease |
| Marvin Nieman, PhD | Pharmacology, Cell Biology | | | Anti-platelet therapeutic targets for managing cardiovascular disease |
| Krzysztof Palczewski, PhD | Pharmacology | James Ahad, Raza Haider | Elliot Choi, Susie Suh, Avery Sears, Jennings Luu (Debarshi Mustafi) | Mapping the Visual Transduction System |
| Phoebe Stewart, PhD | Pharmacology | | | Applying cryo-EM structural methods to a variety of biological complexes including viruses, viral/host factor complexes involving adenovirus and papillomavirus, and protein-based and polymer based nanoparticles |
| Derek Taylor, PhD | Pharmacology | Kirkland Wilson, Sirui Jiang, Raza Haider | | My laboratory studies the structure and molecular mechanisms of macromolecular machines involved in DNA maintenance and RNA maturation and biogenesis. |
| Edward Yu, PhD | Pharmacology | | | Molecular mechanisms of bacterial efflux transporters that mediate antimicrobial resistance |
| **Physiology & Biophysics** | | | | |
| Walter Boron, MD, PhD | Physiology & Biophysics | | | Regulation of intracellular pH, gas channels |
| Matthias Buck, PhD | Physiology & Biophysics | | | Molecular Biophysics of small GTPase-protein interactions in neuronal, cardivascular, and cancer cell signaling. We use molecular biology, NMR and X-ray spectroscopy as well as thermodynamic measurements to determine the basic mechanisms by which proteins transmit signals in cells. In cells. Principal project: The plexin transmembrane receptor in axon guidance. |
| Sudha Chakrapani, PhD | Physiology & Biophysics | | | Understanding the role of structure and dynamics in the functioning of ion channels |
| George Dubyak, PhD | Physiology & Biophysics, Pharmacology, Immunology | Brian Fort | Hana Russo (Phil Verhoef, Andrew Blum, Michael Katsnelson, Michele Kahlenberg, Ben Humphreys) | Inflammatory and apoptotic signal transduction; Signaling by receptors for extracellular ATP in innate immunity, cardiovascular disease, and cancer |
| Joseph LaManna*, PhD | Physiology & Biophysics, Neuroscience, Pathology | David Sweet | | * Not currently accepting MSTP students for rotation or PhD placement |
| Xin Qi, PhD | Physiology & Biophysics | Nicholas Venetos | | Mitochondrial dysfunction in disease |
| Corey Smith, PhD | Physiology & Biophysics | | | Regulation of the sympatho-adrenal stress response |
| Julian Stelzer, PhD | Physiology & Biophysics | | Jiayang Li | Cellular and molecular mechanisms of cardiac muscle contraction in health and disease |
| Witold Surewicz, PhD | Physiology & Biophysics, Pathology | | Michael Babinchak, Raza Haider | Molecular basis of prion diseases and other disorders of protein misfolding |
| **Population and Quantitative Health Sciences** | | | | |
| William Bush, PhD | Epidemiology & Biostatistics | | | Genomics research on Alzheimer's disease |
| Dana Crawford, PhD | Epidemiology & Biostatistics | | | Applying genetic variation data to large-scale epidemiologic and clinical cohorts to better understand human genotype-phenotype associations, with an emphasis on diverse populations |
| Darcy Freedman, PhD, MPH | Epidemiology & Biostatistics | Uriel Kim | | Implementation and dissemination of community-level public health interventions; Community-engaged applied public health research; Primary prevention of chronic disease; Nutrition, food security and obesity |
| Jonathan Haines, PhD | Epidemiology & Biostatistics | Zita Hubler, Michael McHenry | | Genomic and computational approaches to understand the pathophysiology of human disease |
| Sudha Iyengar, PhD | Epidemiology & Biostatistics, Genetics & Genome Sciences, Systems Biology & Bioinformatics | Andrea Cohen, Pam Marcott | (Laura Kopplin) | Genetics of complex diseases in humans (ocular genetics/epidemiology, renal genetics, speech sound disorder/epidemiology, genetic methods) |
| Chun Li, PhD | Epidemiology & Biostatistics | | | Statistical genetics; genetic epidemiology; ordinal data analysis. |

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| Nora Nock, PhD | Epidemiology & Biostatistics, Systems Biology & Bioinformatics | | | Using various "-omics" and neuroimaging approaches to better understand the genetic, environmental, behavioral and neural determinants of obesity and cancer; innovative lifestyle interventions in overweight and obese cancer survivors |
| Fredrick Schumacher, PhD | Epidemiology & Biostatistics | | | Deciphering the inherited genetic architecture of complex traits, particularly cancers of the prostate, colon and breast. My research employs the use of quantitative and population sciences, particularly molecular and genetic epidemiology, to elucidate the genetic architecture of complex phenotypes. |
| Catherine Stein, PhD | Epidemiology & Biostatistics, Systems Biology & Bioinformatics, Clinical and Translational Science | | Michael McHenry | Genetic and environmental susceptibility to tuberculosis and other infectious diseases, and multivariate methods for analyzing complex diseases |
| Daniel Tisch, PhD, MPH | Epidemiology | | | Epidemiology of lymphatic filariasis, malaria, and schistosomiasis. Meta-analysis and mathematical modeling of parasite control strategies. Evaluation of integrated parasite control programs. |
| Scott Williams, PhD | Epidemiology & Biostatistics, Genetics | | Gloria Tavera | Dr. Williams' research focuses on studies of the distribution of genetic variation among human populations and the role that differences in patterns of variation play in disparity of disease among populations. He is especially interested in common, complex diseases that do not have genes of major effect, but are more likely to be due to genetic models involving interactions among risk factors. These interests have led to research dealing with diversity among African and African descent populations and studies of multiple diseases that are either more common in these populations, such as hypertension and preterm birth, or less common, such as gastric cancer. |
| Xiaofeng Zhu, PhD | Epidemiology | | | Genetic mapping studies of hypertension, obesity; development of statistical methods for association studies avoiding the effect of population stratification; admixture mapping; bioinformatics |
| **Radiology** | | | | |
| Agata A Exner, PhD | Biomedical Engineering, Cancer Biology | Daniel Alt, Michael Glidden, Michaela Cooley | (Ravi Patel) | Minimally invasive methods of cancer treatment including ultrasound- modulated, image-guided drug delivery, thermosensitizers for focused hyperthermia, and vasomodulation for improved local ablation and treatment follow-up |
| Christopher Flask, PhD | Biomedical Engineering | | Christian Anderson | Quantitative MRI Assessments of Cystic Fibrosis, Diabetic Nephropathy, Sickle Cell Disease, Pyelonephritis, Polycystic Kidney Disease, and Non-Alcoholic fatty Liver Disease |
| **Rammelkamp Center for Research, MetroHealth Hospital** | | | | |
| Bingcheng Wang, PhD | Pharmacology, Pathology, Cancer Biology | Courtney Bartel | | Molecular mechanisms governing cell migration and proliferation, experimental therapy of cancer metastasis using tumor-targeting peptides. |