Department of Cell Biology and Physiology

Website: http://cellbiology.wustl.edu

Research Electives

Cell Biology and Physiology Research Electives

During the fourth year, opportunities exist for many varieties of advanced clinical or research experiences.

Ghazaleh Ashrafi, PhD
510 McDonnell Sciences Building
Phone: 314-273-5518

Uncovering novel regulators of glycolytic and mitochondrial metabolism at the synapse and their role in the pathology of Alzheimer's disease.

Kendall J. Blumer, PhD
506 McDonnell Sciences Building
Phone: 314-362-1668

Signaling mechanisms in cardiovascular and neurological disorders.

Sergej Djuranovic, PhD
514 McDonnell Sciences Building
Phone: 314-362-9706

Molecular mechanisms of translational control; cellular processes regulated by changes in RNA metabolism.

Denis Goldfarb, PhD
406 McDonnell Sciences Building
Phone: 314-273-3669

Computational mass spectrometry, proteomics, and their applications in biology.

James E. Huettner, PhD
4929 South Building
Phone: 314-362-6628

Excitatory amino acid receptors and synaptic transmission in the central nervous system; neural differentiation of embryonic stem cells.

Silvia Jansen, PhD
4900 South Building
Phone: 314-273-1853

This lab's focus is on elucidating the molecular mechanisms that regulate the architecture, dimensions and dynamics of actin filament networks and then tuning them to support essential cellular functions that range from cell migration and cytokinesis to neurogenesis.

David J. Kast, PhD
4900 South Building
Phone: 314-273-1852

The long-term goal of this lab's research is to understand the fundamental cellular and molecular mechanisms that drive the biogenesis and dynamics of intracellular membrane compartments, including the endocytic vesicles, the endoplasmic reticulum, the Golgi apparatus and the mitochondria.

Vitaly Klyachko, PhD
501 McDonnell Sciences Building
Phone: 314-362-5517

Mechanisms and regulation of neurotransmitter release at individual synapses; functional roles of presynaptic processes in synaptic plasticity and information processing.

Michael Benjamin Major, PhD
406 McDonnell Sciences Building
Phone: 314-273-3669

The Major lab studies how perturbation of specific signal transduction pathways contributes to the initiation, progression and dissemination of cancer.

Robert P. Mecham, PhD
4606 Cancer Research Building
Phone: 314-362-2254

This lab strives to understand the complex process of extracellular matrix assembly and organization, including studying the intracellular pathways used to transport matrix components to the cell surface and identifying helper or accessory proteins that facilitate trafficking and matrix assembly. We also study cell-matrix interactions in development and cellular mechanisms associated with connective tissue remodeling in vascular disease and heritable diseases of the connective tissues.

Colin G. Nichols, PhD
9611 BJC Institute of Health
Phone: 314-362-6630

Ion channel biology; multiple levels of analysis from the molecular basis of channel function to in vivo physiology and disease.

David J. Pagliarini, PhD
1127 Couch Building
Phone: 314-273-2330

We are an interdisciplinary team of scientists driven to understand the biochemical underpinnings of mitochondrial dysfunction in human diseases. Together, we integrate large-scale methodologies with traditional biochemistry to investigate the modulation, adaptation, and basic metabolic function of mitochondria.

David W. Piston, PhD
4912 South Building
Phone: 314-362-9121

The intracellular and intercellular dynamics of cells within the islets of Langerhans play a key role in the regulation of blood glucose levels. The islets are made up of different cell types, but very little is known about the interplay between the different cell types and how this affects their secretion of various hormones. The islets' a-cells secrete insulin in response to increased blood sugar and also in response to neurotransmitters and hormones. Glucagon also plays a key role in blood glucose homeostasis, and it is secreted by the islets' a-cells. High glucose levels inhibit glucagon secretion from a-cells within the islets but not from dispersed a-cells, and the mechanism underlying this phenomenon has not been defined. We use quantitative live cell microscopy to measure single-cell parameters within intact islets held within microfluidic devices in order to expose them to spatially heterogeneous levels of various stimuli. The resulting data are fit using mathematical models of islet functional dynamics, which we are continually modifying to better fit the observed islet physiology.

Sheila A. Stewart, PhD
7610 BJC Institute of Health
Phone: 314-362-7437

Delineation of the molecular mechanisms by which aged stromal cells contribute to tumorigenesis and the molecular mechanisms that ensure high-fidelity telomere replication and genomic stability.

Amber N. Stratman, PhD
416 McDonnell Sciences Building
Phone: 314-273-7928

Mechanisms regulating blood vessel formation, stabilization, and blood flow sensing during development and disease.

Heather L. True-Krob, PhD
413 McDonnell Sciences Building
Phone: 314-362-3934

Biological consequences of yeast prions, in both their capacity to function as novel epigenetic elements and their utility to serve as a tractable model for the analysis of protein misfolding and aggregation that occurs in several neurodegenerative disorders.

Zhongsheng You, PhD
514 McDonnell Sciences Building
Phone: 314-362-9893

Studies of the cellular responses to DNA damage and their cancer relevance, focusing on the functional interplays between the DNA damage checkpoint, DNA repair and chromatin structure.

Peng Yuan, PhD
9608 BJC Institute of Health
Phone: 314-747-3793

The focus of this lab is on the structure and function of ion channels and transporters, which play essential roles in human physiology and disease. How do channels and transporters recognize their specific substrate ions? How do they respond to various stimuli, including chemical ligand, temperature, membrane voltage and mechanical force? How do they interact with the lipid membrane where they reside? To answer these fundamental questions, we use multidisciplinary approaches, including X-ray crystallography, biochemistry, biophysics and electrophysiology. Dysfunction of these membrane proteins could lead to a variety of diseases, such as asthma, hypertension, cancer, heart failure, diabetes, chronic pain and many more. The long-term goal is to provide a detailed mechanistic understanding of ion channels and transporters, which will offer novel strategies for drug development and better treatment of diseases.
