

# 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.

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#### 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.

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#### Kendall J. Blumer, PhD

506 McDonnell Sciences Building  
Phone: 314-362-1668

Signaling mechanisms in cardiovascular and neurological disorders.

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#### Chun-Kan Chen, PhD

4614 Cancer Research Building  
Phone: 314-273-2787

The Chen lab utilizes multi-omic and high-throughput screening approaches to systematically investigate the regulation and function of circRNA in cells and to develop novel circRNA technologies for translational applications. Signaling mechanisms in cardiovascular and neurological disorders are also studied.

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#### Clair Crewe, PhD

1127 Couch Biomedical Research Building  
Phone: 314-362-3240

Understanding extracellular vesicle (EV)-mediated signaling during homeostatic and pathologic metabolic regulation.

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#### Sergej Djuranovic, PhD

4612 Cancer Research Building  
Phone: 314-362-9706

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

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#### Ziao Fu, PhD

9610 BJC Institute of Health  
Phone: 314-273-4416

The Fu Lab specializes in understanding protein structures in their native environments using cryo-electron microscopy. Current projects explore their roles in membrane organization, trafficking, and responses to mechanical forces, with a particular emphasis on their involvement in pediatric kidney diseases and neurological disorders.

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#### Denis Goldfarb, PhD

406 McDonnell Sciences Building  
Phone: 314-273-3669

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

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#### Xue-Yan He, PhD

5516 Cancer Research Building  
Phone: 314-362-5296

The He Lab is dedicated to advancing knowledge of the mechanisms responsible for colorectal tumor progression, with a specific focus on stress and its influence on the tumor microenvironment.

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#### 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.

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#### 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.

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#### 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.

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#### Polina Lishko, PhD

1127 Couch Biomedical Research Building  
Phone: 314-362-6672

The role of bioactive lipid signaling and bioelectricity in the physiology of the inverted epithelia of the brain and retina. Physiology and pathophysiology of steroid signaling in reproduction, aging and neurodegeneration.

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**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.

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**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.

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**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.

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**Slavica Pavlovic Djuranovic, PhD**

416 McDonnell Sciences Building  
Phone: 314-362-6675

Identifying new targets and possible therapies to treat malaria.

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**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'  $\alpha$ -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'  $\alpha$ -cells. High glucose levels inhibit glucagon secretion from  $\alpha$ -cells within the islets but not from dispersed  $\alpha$ -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.

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**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.

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**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.

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**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.

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**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.