

Research Areas:

- Addiction
- Aging
- Behavioral neurobiology
- Cancer
- Cell death
- Circadian rhythms
- Cognitive Function
- Developmental biology
- DNA repair & replication
- Drug abuse and relapse
- Genetics
- Meiosis and fertility
- MicroRNAs
- Mitochondrial biology
- Models of human disease
- Molecular oncology
- Monoamine transmitter systems
- Neurodegeneration
- Psychostimulant drug actions
- Ribosome biogenesis
- Signal transduction
- Stem cell biology
- Stress and Anxiety
- Transcription mechanisms
- Traumatic Brain Injury

RowanSOM--Cell Biology and Neuroscience Department:

Mitochondrial Biology::Transcription Mechanisms

[Mikhail Anikin, Ph.D.](#) Eukaryotic cell tightly regulates production of proteins in mitochondria. In this process, representatives of the PPR family of proteins serve as nuclear-encoded messengers to control mitochondrial gene expression at the level of transcription and later on during maturation, stabilization, and activation of translation of mitochondrial mRNA. Our research is currently focused on molecular mechanisms of action of PPR proteins.

Transcription mechanisms

[Sergei Borukhov, Ph.D.](#) We are focusing our studies on the structure and function of prokaryotic multisubunit RNA polymerase, and on analysis of molecular mechanism of action and biological role of transcription factors Gre and their homologs.

Behavioral Neurobiology

[Daniel Chandler, Ph.D.](#) My laboratory is focused on clarifying the structure and function of the brainstem nucleus locus coeruleus (LC), a region involved in arousal, attention, and stress. We use a combination of anatomical, viral-genetic, molecular, and electrophysiological approaches to identify how LC interacts with the rest of the brain and how it is affected by stress.

Behavioral Neurobiology::Genetics::Neurodegeneration

[Howard Chang, Ph.D.](#) Changes in gut microbial content, which often result in alteration of gut—brain signaling, are associated with aging and disease. Our research goals are to understand how alteration in gut microbial composition impacts neuron activity and behavior, and how gut dysbiosis contributes to neuropathology and neurodegenerative disease.

Behavioral Neurobiology::Monoamine Transmitter Systems::Psychostimulant Drug Actions

[David Devilbiss, Ph.D.](#) Our work focuses on the central monoamine and neuropeptide regulation of neural coding the underlies sensation and cognition. Electrophysiological, computational, pharmacological, and behavioral techniques are used to study neural dynamics related to cognitive changes in stress, ADHD, and concussion.

Neurodegeneration::Models of human disease::Behavioral neurobiology

[Jeremy Francis, Ph.D.](#) We are currently investigating neuron-glia interactions in models of both development and human neurodegenerative disease with a focus on the maintenance of metabolic integrity. Avenues of therapeutic intervention for major neurodegenerative diseases are explored using a gene therapy technology platform in animal model systems.

Behavioral neurobiology::Models of human disease::Neurodegeneration

[Francois Gould, Ph.D.](#) Imagine Thanksgiving, but you must drink the roast turkey as a milkshake. That is one challenge the many people who suffer from swallowing disorders endure. In my research, I use animal models to understand neural and muscular causes of swallowing deficits, particularly in premature birth and Parkinson's disease.

Aging::Cancer::Models of human disease::Signal transduction::Stem Cell Biology

[James M. Holaska, Ph.D.](#) My research program studies how the nuclear envelope regulates fundamental cellular processes, including genomic architecture, transcription and cell signaling. Current projects:

- 1) How do nuclear envelope proteins regulate stem cell differentiation?
- 2) How does nuclear envelope regulation of nuclear morphology drive cancer metastasis?

Aging::Cardiovascular::Inflammation

[Carl Hock, Ph.D.](#) Current work is focused on the effect of humoral mediators and inflammatory cells in the pathophysiology of ischemic states, the effects of dietary lipids on cardiovascular function and the response of the young and aging heart to ischemia and reperfusion.

Developmental Biology::Genetics::MicroRNAs::Stem Cell Biology

[Hristo Houbaviy, Ph.D.](#) We are interested in the roles of microRNAs in embryonic stem (ES) cells and during the early development of the mouse. Specifically, we are applying biochemical and mouse model approaches to elucidate the functions of miR-290-295 / miR-371-373 which appear to be ES cell and early embryo specific.

Tongue Genetics::Signal Transduction::Models of human disease

[Archana Kumari, Ph.D.](#) Taste disturbances in humans affect appetite and nutritional status. Therefore, I have aimed to understand the biology behind these taste alterations. I am interested to understand the role of the Hedgehog (HH) signaling pathway in tongue homeostasis as well as to delineate its role in taste disruptions, a severe side effect for cancer patients treated with HH pathway inhibiting drugs. My research utilizes animal model and incorporates techniques including cryo-sectioning, immunostaining, and microscopy to determine the changes in tongue. In addition, molecular biology methods are used to identify genes responsible for taste organ alteration. I see my research as a part of a broad effort in the cell and molecular sciences to understand the taste system in the context of human disease and treatments.

Development::Gene Therapy::Genetic Diseases::Neuroscience

[Paola Leone, Ph.D.](#) My research focus is to characterize neuropathological pathways underlying the degenerative processes associated with pediatric leukodystrophies, such as Canavan Disease, and test *in vitro* and *in vivo* novel pharmacological and stem cell applications for the development of a therapy for this disease and other leukodystrophies.

Behavioral neurobiology::Models of human disease

[Jessica Loweth, Ph.D.](#) My laboratory focuses on studying the effects of cocaine and chronic stress exposure on long-lasting changes in relapse vulnerability. We use a rodent model of craving and relapse and combine behavioral and biochemical techniques to identify neuroadaptations driving cue- and stress-induced changes in relapse vulnerability over time.

Behavioral neurobiology::Models of human disease::Monoamine systems

[Daniel Manvich, Ph.D.](#) We examine the neurobiological mechanisms by which various stressors trigger drug seeking. We employ a variety of methodologies including rodent models of drug use/relapse, chemogenetic manipulation of neural activity, and brain activation mapping, to characterize the brain circuitry mediating stress-induced drug seeking.

Gene Expression/Transcription:: Mitochondrial Function::Neuroscience::Oxidative Stress::RNA Processing/Turnover::Substance Abuse

[Dmitriy Markov, Ph.D.](#) My research is focused on regulation of mitochondrial transcription and transcription-coupled processes and how they change in response to oxidative stress in neuronal tissue.

Behavioral Neurobiology::Genetics

[Sean McBride, M.D., Ph.D.](#) We utilize genetic models of disorders of cognition in flies and mice to advance the understanding of how memory works to identify potential drug targets for the amelioration of cognitive impairments, which we advance to clinical trials. We work with models of Alzheimer's disease, intellectual disability and autism spectrum disorders.

Behavioral neurobiology::Cognitive function::Monoamine transmitter systems::Psychostimulant drug actions::Traumatic Brain Injury

[Rachel Navarra, Ph.D.](#) We utilize a combination of in-vivo electrophysiology and behavioral pharmacology to study the neurobiology of sensory signal processing, decision making, and higher order cognitive functions. We are interested in the underlying mechanisms by which cognitive-enhancing drugs, psychostimulants, and traumatic brain injury may alter these processes.

Ribosome biogenesis

[Dimitri Pestov, Ph.D.](#) We study the mechanisms of ribosome biogenesis in mammalian cells in connection with regulation of cell growth and proliferation. Our major goal is to understand how the accuracy of ribosome assembly is controlled at the molecular level and how defects in this process contribute to human disease.

Behavioral neurobiology::Monoamine transmitter systems::Stress and anxiety

[Benjamin Rood, Ph.D.](#) Guided by the idea that social behavior is inextricably linked to human health, our research explores the neural structures involved in social behavior. Current work uses transgenic mouse models, electrophysiology, mRNA sequencing, and social behavior paradigms to study the physiology and function of cells that respond to the neuropeptide vasopressin, which has been implicated in both social affiliation and aggression.

Protein Degradation/Trafficking::Protein Synthesis/Translation::RNA Processing/Turnover::Signal Transduction

[Natalia Shcherbik, Ph.D.](#) We currently focus on elucidating the mechanisms of ribosome turnover using *Saccharomyces cerevisiae* as a model system. We are particularly interested in the role of ubiquitination in controlling the activity of ribonucleases that target ribosomes and how this process is regulated in the cell.

Aging::Inflammation::Oxidative Stress

[Bernd Spur, Ph.D.](#) We focus on mediators of inflammation, including prostaglandins, phytoprostanes, leukotrienes, lipoxins, resolvins, neuroprotectins, docosatrienes as well as isoprostanes. These mediators are prepared in the natural and isotopically labelled form to explore their biological activities and serve as markers in inflammatory diseases such as Asthma and Alzheimer.

Aging::Calcium::Drug Development::Neuroscience::Signal Transduction::Vision

[Venkat Venkataraman, Ph.D.](#) We are investigating the processes of neuronal transduction in biological clocks and aging with respect to the role of Ca²⁺ signaling via alpha2 adrenergic receptors and membrane guanylate cyclases.

Behavioral neurobiology

[Barry Waterhouse, Ph.D.](#) The primary research focus of my laboratory is to understand the role of the central monoaminergic systems in brain function and behavior. We concentrate on anatomy, pharmacology, physiology, and molecular biology of the brainstem noradrenergic and serotonergic systems as they relate to cognition and sensory signal processing.

Behavioral neurobiology::Addiction::Cognitive function

[Elizabeth West, Ph.D.](#) My research utilizes *in vivo* electrophysiology, optical imaging, and optogenetic manipulations in rats to determine the circuit level mechanisms mediating learning, decision-making, and cognitive flexibility in animal models of substance use disorders and stress disorders.

Models of Human Disease::Infection::Inflammation

[Kingsley Yin, Ph.D.](#) The focus of our lab is to investigate the cellular mechanisms by which Specialized Pro-resolving Lipid Mediators (SPMs) reduce inflammation, prevent immunosuppression, increase survival and enhance bacterial clearance in models of bacterial infection. Novel properties of SPMs to decrease bacterial virulence (biofilm formation, exotoxin production) are also being studied.

RowanSOM --Molecular Biology Department:

Cancer::Cell Cycle/Cell Differentiation::Cell Structure::DNA::Gene Expression/Transcription ::Protein Synthesis/Translation

[Salvatore Caradonna, Ph.D.](#) My laboratory is interested in the post-translational mechanisms that regulate proteins involved in base-excision repair of DNA. We are studying the aberrant pathways that lead to uracil misincorporation into DNA and strategies that may exploit these pathways for cancer drug development. We are also involved in the study of atypical cyclin-like proteins that affect cell-cycle phase transitions.

Cell death::Autophagy:: Molecular oncology

[Katrina Cooper, D.Phil.](#) The long-term goal of my research is to elucidate the molecular mechanism(s) by which cell fate decisions are made in response to environmental cues. In other words, how do cells decide to elicit pro-death or pro-life (autophagy) responses upon encountering unfavorable environmental conditions. Misinterpretation of these signals can result in cells choosing the incorrect fate, which, in turn, leads to and/or promotes tumor formation. The focus of my group centers on a highly conserved protein called cyclin C that is a newly identified tumor suppressor. Befitting this title, this nuclear protein plays an important role in dictating cell fate decisions, dependent upon the type of stress sensed. To execute this we predominantly use the budding yeast model system as well as recently mammalian cell lines.

Models of Human Disease::Molecular Oncology::Stem Cell Biology

[Renee Demarest, Ph.D.](#) Research in my laboratory focuses on delineating the molecular pathways required for the development, maintenance, and relapse of T-cell acute lymphoblastic leukemia (T-ALL) using mouse models of disease. In addition, my laboratory also screens new therapeutic candidates for efficacy and is developing novel models for preclinical testing in order to increase the translational success rate to the clinic.

Developmental biology::Genetics::Transcription mechanisms::Meiosis and fertility

[Ronald Ellis, Ph.D.](#) We study the development and evolution of germ cells, using cutting-edge techniques that are have made nematodes a leading model for animal biology. First, we study the control of germ cell fates. Animals must produce sperm or eggs to reproduce. Although these cells differ dramatically, they are made from similar progenitors. Understanding how this process is controlled could revolutionize our ability to treat reproductive disorders and infertility in humans. Second, we study the origin and evolution of self-fertility. Sexual traits are among the most rapidly changing features in every species. To learn how new traits originate and change, and how developmental pathways shape these processes, we are studying how some nematodes became self-fertile. Third, we study apoptosis in germ cells. Programmed cell deaths play a critical role in germ cell development and aging, and help ensure that mature oocytes are of high quality. We are investigating how cell deaths accomplish these ends.

Cell death::Models of human disease::Molecular oncology

[Gary Goldberg, Ph.D.](#) Cells must communicate with each other to coordinate the development and survival of an animal. This communication can be mediated by diffusible factors that pass between cells, or by direct contact through cell junctions. I am interested in how intercellular communication affects cell growth and differentiation, with an emphasis on how cell communication controls tumor cell growth.

Mitochondrial biology::Genetics::Ribosome biogenesis

[Michael Henry, Ph.D.](#) Research in the laboratory is focused on evolutionarily conserved mitochondrial translational activators, using yeast as a model system. Defects in mitochondrial gene expression can compromise cellular energy production and generate reactive oxygen species that promote degenerative disease, aging, and cancer.

Developmental biology::Genetics::MicroRNAs

[Eric Moss, Ph.D.](#) We study developmental timing, microRNAs and translational control in *C. elegans* and the mouse. The worm heterochronic gene *lin-28* is regulated by microRNAs and encodes a specific mRNA-binding protein. Its human homologue, *Lin28*, appears also to be a microRNA-controlled developmental regulator.

Cell Death::Mitochondrial Biology::Signal Transduction

[Catherine Neary, Ph.D.](#) My research examines cancer cell dependence on abnormal AMP-dependent kinase (AMPK) activation, as part of a larger project examining how metabolic stress affects the initiation of cell death, and how organelles, specifically the mitochondria and cytoskeleton, communicate during the death process.

Mitochondrial dynamics::Apoptosis::Transcription::Oxidative Stress::Cancer

[Randy Strich, Ph.D.](#) In response to cellular damage, the cell must decide between repairing the injury and continue living or inducing a programmed cell death pathway termed apoptosis. My laboratory utilizes both yeast and transgenic mouse models to dissect the molecular decision underlying apoptotic entry. Specifically, we focus on the role that mitochondrial dynamics plays in this decision and how this process impacts human diseases including cancer.

DNA replication & repair::Neurodegeneration

[Brian Weiser, Ph.D.](#) We use chemical and molecular tools to examine the function of low affinity protein-protein complexes. Separate projects examine (1) DNA repair proteins involved with adaptive immunity and chemotherapy response, and (2) neuronal deacylase enzymes involved with neurodevelopment and neurodegeneration.

RowanSOM –New Jersey Institute for Successful Aging:

Aging::Neurodegeneration::Blood-brain barrier::Dementia::Delirium::Traumatic brain injury

[Nimish Acharya, Ph.D.](#) My research program is aimed at elucidating and characterizing cellular and molecular pathway(s) that trigger and perpetuate neuroinflammatory and neurodegenerative changes in events and evolving pathologies that cause cerebrovascular damage as in Alzheimer's disease, traumatic brain injury, aging, and postoperative delirium in the elderly.

Aging::Cancer::Cell Structure::Diseases - Human – Non Cancer::Inflammation::Neuroscience

[Robert Nagele, Ph.D.](#) We are focused on elucidating the role of breakdown of the blood-brain barrier in the initiation and progression of Alzheimer's and other neurodegenerative diseases and developing therapeutic strategies aimed at preventing this breakdown and the resulting leak of potentially damaging blood components into the brain tissue. In addition, we are investigating the utility of autoantibodies as blood-based biomarkers for early disease detection and monitoring of disease progression.

GENESIS BIOTECHNOLOGY GROUP
Hamilton, NJ
Members of RowanGSBS Faculty

Molecular Oncology::Signal Transduction

Venu Bommireddy, Ph.D. Associate Member. Cytosolic DNA sensing pathway is the first line of defense against foreign pathogens/invaders and play central role in cGAS-STING mediated innate immunity, inflammation and pathogen resistance. Small molecule synthetic compounds that target these pathways are being investigated to develop effective Immunomodulatory therapeutics. vgrbv@Oncoveda.com

Drug Discovery::Cancer

Michael McQueney, Ph.D. Associate Member. Our laboratory focuses on: 1) identifying small molecule drug candidates that modulate the immune system in the tumor microenvironment as a means to treat cancer, and 2) identifying novel biomarkers for cancer diagnosis. mmcqueney@oncoveda.com

Cell Cycle/Cell Differentiation::Drug Development::Gene Expression/Transcription::Genetic Diseases::Pathogenic Microorganisms::Signal Transduction

Joseph Nickels, Ph.D. Associate Member. Our research uses proteomic/genomic methods and mouse models to understand the biology of diseases, such as cancer initiation and metastasis, cardiovascular disease, and infectious mycoses. Our goal is discovering novel genes that can be used as biomarkers and drug targets, thus allowing us to diagnose and treat these diseases. jnickels@mdlab.com

Models of Human Disease

Ilana Stroke, Ph.D. Associate Member. We are using high throughput compound screening (HTS) technology to identify small molecules providing the basis for novel drugs modulating microbial infection, the immune system, cancer, metabolic disease, and cardiovascular disease. istroke@mdlab.com