### Mitochondrial Transcription in Yeast

We study mitochondrial gene expression at the level of mitochondrial RNA polymerase. We use biochemical and genetic methods to characterize the yeast mitochondrial transcription system.

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<th># of Students to Supervise:</th>
<th>1</th>
<th>Phone:</th>
<th>856-566-6236</th>
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<tbody>
<tr>
<td>Clinical/Behavioral</td>
<td></td>
<td>Lab Based</td>
<td><a href="mailto:anikinmi@rowan.edu">anikinmi@rowan.edu</a></td>
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### Mechanisms of Origin Recognition Complex in Mammalian DNA Replication

Faithful replication of chromosomal DNA is necessary for cell division and has remained conserved in all species. DNA replication consists of four stages: initiation, priming, elongation, and termination. The initiation of DNA replication is a pivotal point in the cell’s life cycle and it is highly regulated in eukaryotes to occur only once per cell division cycle. If the initiation of DNA replication is inhibited, DNA replication and cell division cease to occur. Consequently, the initiation of DNA replication is important in normal development as well as in development of a variety of diseases, such as cancer. DNA replication proteins in prokaryotic organisms are better understood. Unlike prokaryotes, eukaryotes, particularly mammals, are highly evolved and have complex genetics and physiology. Nonetheless, understanding the mechanisms of DNA replication in prokaryotes continues to provide guidance in studying DNA replication in eukaryotes including humans. We plan to extend these studies to human Origin Recognition Complex (hsORC) in order to understand human DNA replication. We will clone and express ORC proteins and its fusions with fluorescence proteins to understand its dynamics in the cell cycle. A major effort will be to develop fusion constructs so that we can visualize the formation of ORC complex and its subcomplexes by Confocal microscopy.

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### Mechanisms of Regulation of Initiation of DNA Replication

Our hypothesis is that yabA and soj gene products disrupt DnaA-origin interaction and turn off new initiation. YabA protein is a suppressor of nonsense initiation of DNA replication observed only in the genus Bacillus. We will elucidate the mechanism of YabA repression initiation particularly the inhibition of interaction of DnaABA with the origin. Soj protein, a unique and conserved protein in the genus Bacillus, is a multifunctional protein that appears to be involved in plasmid partitioning, sporulation, as well as in the repression of initiation of DNA replication. We will analyze the mechanisms by which Soj regulates initiation of DNA replication particularly regulation of Bacillus DnaA protein (DnaABA) and its interaction with the origin. We hope to develop detailed insights of the mechanisms of these important regulatory steps.

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<tr>
<td>#</td>
<td>Name</td>
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<tr>
<td>4</td>
<td>Chetna Dave</td>
<td>NJISA</td>
<td>Chronic Renal Failure in the Elderly / The Role of Procrit in Patients with Renal Failure</td>
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<td>It is a trial of conservative medicine with renal failure in the elderly. Also, the treatment options of chronic anemia and the role of Procrit in patients with renal failure who are not on dialysis.</td>
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<tr>
<td>5</td>
<td>Ronald Ellis</td>
<td>Molecular Biology</td>
<td>Mitochondrial Genetics</td>
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<td>The student with carry out an extensive analysis of the expression of genes required for mitochondrial function, using quantitative RT-PCR techniques. Wild-type animals will be compared with animals in which genes that might regulate mitochondrial function have been knocked down by RNA interference.</td>
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<tr>
<td>6</td>
<td>Gary Goldberg</td>
<td>Molecular Biology</td>
<td>Investigate mechanisms of novel cancer treatments</td>
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<td>We are developing novel cancer treatments. We are looking at how these compounds affect cancer cell growth and migration.</td>
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<td>7</td>
<td>Michael Henry</td>
<td>Molecular Biology</td>
<td>Yeast as a model system to study autism and cancer</td>
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<td>My lab is pursuing two different broad research goals. The first is developing a yeast model system to identify autism predisposition genes. The second goal is concerned with understanding how cells switch from respiratory to glycolytic metabolism. Normal cells predominately respire glucose while most cancer cells favor glycolysis.</td>
</tr>
</tbody>
</table>
Carl Hock  
**Dept:** Cell Biology  
**Effect of dietary lipids on the generation of reactive oxygen species, neutrophil infiltration, cytokine production,**  
Work in the laboratory is directed toward the study of cardiovascular function under both normal and pathophysiologic conditions. 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.

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<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:hock@rowan.edu">hock@rowan.edu</a></td>
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</tbody>
</table>

Hristo Houbaviy  
**Dept:** Cell Biology  
**The Roles of MicroRNAs in Embryonic Stem (ES) Cells**  
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.

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<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:houbavhr@rowan.edu">houbavhr@rowan.edu</a></td>
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</table>

Joanne Kaiser-Smith  
**Dept:** Graduate Medical Education (GME)  
**Preventive Health Care Practice at an Osteopathic Post Doctoral Training Institute (OPTI). Is there a difference b**  
The Researcher will identify the age appropriate preventive health care activities and by questionnaire, interview residents both primary and specialty care as to their compliance with these recommendations.  
It is to be expected that primary care trainees will be more compliant because they are regularly educating their patients as part of their education.

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<td>Animal</td>
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<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:kaiserjo@rowan.edu">kaiserjo@rowan.edu</a></td>
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</tbody>
</table>
**Paola Leone**

**Dept:** Cell Biology

**Gene Therapy of Neurodegenerative Diseases and Pathophysiology of Canavan Disease**

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 therapies for this disease and other leukodystrophies.

# of Students to Supervise: 1

- Lab Based
- Animal

**Robert Nagele**

**Dept:** NJISA

**Alzheimer's Disease Research**

This year, our research is focused on the following two things. First, we are investigating the role of blood brain barrier breakdown in the triggering and progression of various neurodegenerative disease (emphasis on Alzheimer's disease) and seeking viable therapeutic strategies to block blood-brain barrier permeability. Second, we are continuing our work on the use of autoantibodies as diagnostic biomarkers for disease along with protein microarrays to detect these autoantibodies.

# of Students to Supervise: 3

- Clinical/Behavioral
- Lab Based
- Animal

**John G. Pastorino**

**Dept:** Molecular Biology

**Targeting Hexokinase II in Chemotherapy**

Elucidate the pathways by which cancer cells are able to exploit their increased expression of the glycolytic enzyme, hexokinase II. Hexokinase II is able to bind to the mitochondria, whereupon it inhibits cell death. By exploring mechanisms to detach hexokinase II, the mitochondria and cancer cell will be rendered more sensitive to the cell death inflicted by chemotherapeutic agents. In this way, cancer cells will be more conducive to apoptosis than their normal counterparts, thereby lessening the dose of a chemotherapeutic agent required and decreasing toxic side effects.

# of Students to Supervise: 1

- Lab Based
- Animal
# Dimitri Pestov

**Dept:** Cell Biology

**Research Interests**

**Ribosome Biogenesis in Mammalian Cells**

We study how mammalian cells ensure the accurate synthesis of ribosomes, the molecular machines that make all proteins in an organism. Defects in ribosome formation are known to be a factor in cancer and several congenital diseases, and we are trying to better understand the molecular basis of this connection.

**# of Students to Supervise:** 1  
**Phone:** 856-566-6904  
- Clinical/Behavioral  
- Lab Based  
- Animal  
- Email: pestovdg@rowan.edu

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# Rachel Pruchno

**Dept:** NJISA

**Research Interests**

**Ongoing Research on Aging in New Jersey: Bettering Opportunities for Wellness in Life**

NJISA has developed and maintains a unique database called ORANJ BOWL ([website: http://oranjbowl.net](http://oranjbowl.net)). We have demographic, physical and mental health, nutrition, and health behavior on over 4,000 persons age 50-74 living in N.J. who are randomly selected and invited to participate. Data on a host of topics can be analyzed. Students would be responsible for topic selection, literature review, data analysis and interpretation. NJISA staff would support all aspects of the project.

**# of Students to Supervise:** 1  
**Phone:** 856-566-6822  
- Clinical/Behavioral  
- Lab Based  
- Animal  
- Email: pruchna@rowan.edu

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# Randy Strich

**Dept:** Molecular Biology

**Research Interests**

**Regulation of programmed cell death by cyclin C**

Cyclin C is a conserved nuclear protein that regulates transcription. In response to cellular damage, cyclin C translocates from the nucleus to the cytoplasm where it interacts with the mitochondria to initiate programmed cell death. This project will utilize biochemical, genetic and cell biological assays to study the pathway that mediates the nuclear to cytoplasmic export of cyclin C.

**# of Students to Supervise:** 1  
**Phone:** 856-566-6043  
- Clinical/Behavioral  
- Lab Based  
- Animal  
- Email: strichra@rowan.edu
We will be accepting students who are interested in conducting short-term surveys on OMM utilization, referrals, and attitudes. These projects will be designed in collaboration with the students so that they can be accomplished within the timeframe of the SMRF.

# of Students to Supervise: 3  Phone: 856-566-7010

- [ ] Clinical/Behavioral  Email: survesa@rowan.edu
- [ ] Lab Based
- [ ] Animal

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**Transcription by Human Mitochondrial RNA Polynerase**

We are interested in studying transcription by human RNA polymerases. We do Functional-Structural studies of transcription initiation complexes using a number of biochemical and genetic approaches.

# of Students to Supervise: 1  Phone: 856-566-6327

- [ ] Clinical/Behavioral  Email: temiakdm@rowan.edu
- [x] Lab Based
- [ ] Animal

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**Signal Transduction in circadian rhythms and Alzheimer's disease**

This lab investigates the signal transduction pathways related to calcium in the physiological process of circadian rhythm and the neurodegenerative Alzheimer's disease.

# of Students to Supervise: 1  Phone: 856-566-6418

- [x] Lab Based  Email: venkatar@rowan.edu
- [ ] Animal

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**Calcium signal transduction**

The project involves evaluating the role of neuronal calcium sensor proteins in normal and diseased brain.

# of Students to Supervise: 1  Phone: 856-566-6418

- [x] Lab Based  Email: venkatar@rowan.edu
- [x] Animal
Lipoxin and Lipxin analogs in sepsis

Sepsis is a major medical problem in the United States. The disease is results from overwhelming bacterial infection and is characterized by inability to regulate the immune response. Early release of large amounts of inflammatory mediators may lead to organ injury and failure while later in sepsis, immunoparalysis may occur and leading to the host's inability to clear existing pathogen. The research focusses on investigating the mechanisms and actions of Lipoxin and Lipxin analogs in resolving inflammation such that the host does not succumb to an early inflammatory storm while still retaining the ability to clear bacterial load.