### Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

Predictors of substance abuse treatment retention among incarcerated women returning to the community

This project will involve analyzing data from ~150 women who have entered the Working Together for Women (WTW) program during the past two years in the Dept. of Psychiatry’s Caring Together Program. The program is interested in identifying risk factors at intake that predict poor treatment retention (i.e., drop-out) as well as supportive factors that predict greater retention. In addition, urine screen data will also be examined as an outcome.
## 2018 Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Vineet Bhandari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Professor</td>
</tr>
<tr>
<td>Department</td>
<td>Pediatrics (Neonatology)</td>
</tr>
<tr>
<td>Office Location</td>
<td>St. Christopher's Hospital for Children</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215-762-7595; 215-427-5202</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:vineet.bhandari@drexelmed.edu">vineet.bhandari@drexelmed.edu</a></td>
</tr>
</tbody>
</table>

**Amount of time you are available for direct student supervision:**


**Any specific skills or prior experience required:**


**Project Information**

*Please provide a title or a 2-3 sentence description of the research topic*

- Hyperoxia-induced injury to the developing lung
- Bronchopulmonary dysplasia
- Pulmonary hypertension
- Stem cells in the brain and lung
- Role of miRNA in BPD
## Faculty Sponsor
Wilbur Bowne

### Title
Associate Professor of Surgery, Associate Professor of Cellular & Molecular Bio

### Department
Surgery

### Office Location
Suite 7150, New College Building

### Phone Number
215-762-1647

### E-mail
wilbur.bowne@drexelmed.edu

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**Amount of time you are available for direct student supervision:**

10 hours per week - 1 postdoctoral research fellow and Master's level Research Assistant will also be present in the lab.

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**Any specific skills or prior experience required:**

Previous experience with cell cultures or with rodents preferred but not required.

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### Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

Title: Development of an in vivo mouse model of colorectal peritoneal carcinomatosis and treatment using targeted therapy of MDM2 overexpression
## 2018 Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Jane Clifford</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Professor and Chair</td>
</tr>
<tr>
<td>Department</td>
<td>Biochemistry and Molecular Biology</td>
</tr>
<tr>
<td>Office Location</td>
<td>Center City, 11108 New College Building</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215-762-4446</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:jc79@drexel.edu">jc79@drexel.edu</a></td>
</tr>
</tbody>
</table>

### Amount of time you are available for direct student supervision:

5 hours/week

### Any specific skills or prior experience required:

Prefer experience with cell culture and molecular techniques

### Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

**Regulation of Genomic Stability**

Sp1 is a eukaryotic transcription factor that is also involved in repair of DNA double strand breaks (DSBs), the most threatening type of DNA damage. One project involves determining the ways in which Sp1 regulates repair, including studies of chromatin structural modifications at DSBs and recruitment of DNA repair factors.

Sp1 is also involved in maintaining chromosomal structure. It localizes to both centrosomes and centromeres. Projects involve determining how Sp1 maintains proper chromosomal segregation. Additionally, Sp1 is overexpressed in many cancers and its overexpression is an indicator of poor prognosis. Another project involves experiments to determine how this alters sensitivity to chemotherapeutic agents.

Failure to accurately repair DSBs or regulate chromosomal segregation will result in genomic instability.
# 2018 Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Kimberly Dougherty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Spinal locomotor circuits</td>
</tr>
<tr>
<td>Department</td>
<td>Neurobiology and Anatomy</td>
</tr>
<tr>
<td>Office Location</td>
<td>Queen Lane room 279</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215-991-8407</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:kjd86@drexel.edu">kjd86@drexel.edu</a></td>
</tr>
</tbody>
</table>

**Amount of time you are available for direct student supervision:**

I will be involved in the project and will be available for experimental assistance, scientific discussion, etc. daily. The student will be working along side of our experienced doctoral students, postdoc, and technician.

**Any specific skills or prior experience required:**

Experience with mice is helpful but not required.

## Project Information

*Please provide a title or a 2-3 sentence description of the research topic*

Our lab is interested in the spinal neuronal circuitry generating the locomotor rhythm and pattern of motor neuron activation required for walking. We are currently using a variety of techniques in the lab including electrophysiology (ex vivo spinal cord preparations), immunohistochemistry, and behavior to understand circuit connectivity in intact systems, changes to spinal neurons and circuits below injury in our mouse spinal cord injury model, and corrections or further alterations resulting following rehabilitation paradigms.
# 2018 Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Eileen K Jaffe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Professor</td>
</tr>
<tr>
<td>Department</td>
<td>Molecular Therapeutics, Fox Chase Cancer Center (DUCOM Biochemistry...)</td>
</tr>
<tr>
<td>Office Location</td>
<td>Reimann 455, on the FCCC campus</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215 728-3695</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:eileen.jaffe@fccc.edu">eileen.jaffe@fccc.edu</a></td>
</tr>
</tbody>
</table>

**Amount of time you are available for direct student supervision:**

PI is generally available for discussion and participation in experimental design. Direct training and/or supervision of laboratory procedures will likely be carried out by permanent laboratory personnel (e.g. post-docs).

**Any specific skills or prior experience required:**

Prior work with purified proteins is a plus, but not essential.

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## Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

Phenylketonuria (PKU) is an inborn error of metabolism, characterized by neurotoxic accumulation of phenylalanine, and which can be caused by changes in the sequence of the enzyme phenylalanine hydroxylase (PAH). It is recently established that PAH exists as an equilibrium of architecturally distinct protein structures, where the plasticity of this equilibrium normally keeps phenylalanine at safe levels. The Jaffe laboratory is currently applying biochemical and biophysical tools in order to determine the relationship between PKU and the position of the PAH protein structure equilibrium with the long term goal of developing new pharmacological chaperones to treat PKU.
Amount of time you are available for direct student supervision:

At least 1 hour each day and a senior lab person will oversee student training.

Any specific skills or prior experience required:

Not necessarily but previous laboratory experience will be a plus.

Project Information

Please provide a title or a 2-3 sentence description of the research topic

HTLV-1 is a complex human retrovirus, an etiologic agent in causing malignant and intractable T-cell neoplasia. About 5% of the infected population progress to acquiring a more aggressive form of non-Hodgkin’s lymphoma (NHL), termed as Adult T-cell leukemia/lymphoma (ATLL). ATLL is a malignancy of mature CD4 T cells with frequent visceral involvement, lymphadenopathy, hypercalcemia, and monoclonal proliferation of infected tumor cells known as “flower cells”. In recent studies, we have identified a novel role for the Myocyte enhancer factor-2 in HTLV-1 promoter transactivation and associated T-cell transformation. Now we wish to characterize the role of various MEF-2 isoforms (2A, 2B, 2C and 2D) in the development of ATLL, and test a unique strategy to curb MEF-2 activity as a novel therapeutic approach. MEF-2 is held transcriptionally silent via class II histone deacetylases (HDACs) that maintain chromatin in a condensed hypoacetylated state. HDACs are a group of enzymes involved in regulation of chromatin unfolding and gene expression by working in opposition to histone acetyl transferases (HATs). Because of their widespread influence on oncogenesis, HDACs have become the target of an entire class of anticancer drugs, known as histone deacetylase inhibitors (HDACi). Interestingly, a specific class IIa inhibitor, MC1568 is capable of stabilizing MEF-2:HDAC complex by inhibiting HDAC4 but not HDAC3 thus keeping MEF-2...
<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Sandhya Kortagere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Department</td>
<td>Microbiology and Immunology</td>
</tr>
<tr>
<td>Office Location</td>
<td>G81- Queen Lane</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215-991-8135</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:sk673@drexel.edu">sk673@drexel.edu</a></td>
</tr>
</tbody>
</table>

Amount of time you are available for direct student supervision:

50% and the rest will be supplemented by a Postdoctoral Associate or a senior graduate student

Any specific skills or prior experience required:

The project involves performing behavioral studies with Rats. So prior experience in handling rats/mice or ability to quickly learn the skills is required.

Project Information

Please provide a title or a 2-3 sentence description of the research topic

Evaluating Tat mediated regulation of Dopamine receptors in neurocognitive impairment
We will understand the in vivo effects of various Tat variants on Dopamine D1 and D2 receptor mediated cognitive behavioral tasks in rats. We will also utilize pharmacological agents to treat the cognitive impairment caused by Tat peptides.
2018 Medical Student Summer Research Fellowship Project List

Faculty Sponsor: J. Yasha Kresh and Richard Hamilton (Clinical Co-Advisor)

Title: Professor and Research Director

Department: Cardiac Surgery / Medicine (Cardiology) / Emergency

Office Location: 6320 NCB

Phone Number: 215 762 1703

E-mail: jkresh@drexelmed.edu

Amount of time you are available for direct student supervision:

No specific restriction on time

Any specific skills or prior experience required:

Basic understanding of (cardiac) electro-physiology. An 'engineering mindset' to solve clinical problems and able to function in an interdisciplinary research environment focused on innovation and entrepreneurship.

Project Information

Please provide a title or a 2-3 sentence description of the research topic

Sequential Cardiac Defibrillation (SCD): Simulation and Electodynamic Modeling

Survival is highest in out-of-hospital cardiac arrest setting among victims when early CPR and rapid (shockable arrhythmias) defibrillation is instituted. A large subset of individuals in ventricular fibrillation (VF) don’t respond to multiple defibrillation shocks and remain in refractory VF. Shortening the time to effective resuscitation is critical to survival.

The concept of double sequential defibrillation was first described in a mid-1980, consisting of shocks delivered one second apart and employed different vectors (i.e., pathways) across the heart. It was shown that "two sequential shocks over different pathways reduce both total energy and peak voltage required to terminate ventricular fibrillation."

The Project will help establish the needed mechanistic rationale (guidelines / protocols) for implementing SCD in patients with recurrent ventricular dysrhythmias. In particular, the electodynamic and relevant electrophysiologic spatio-temporal
2018 Medical Student Summer Research Fellowship Project List

Faculty Sponsor: Michele Marcelongo
Title: Department Head & Professor
Department: Materials Science & Engineering
Office Location: 344 LeBow Engineering
Phone Number: 215-895-2329
E-mail: marcelongo@drexel.edu

Amount of time you are available for direct student supervision:
All week, all summer.

Any specific skills or prior experience required:
None

Project Information

Please provide a title or a 2-3 sentence description of the research topic

Perform osteoblast cell culture on 3D Printed Spinal fusion cages for treatment of intervertebral disc disease and back and neck pain. Will work in collaboration with 2 PhD students and PI. Have previously supervised med students in this program past two years. Work resulted in publication.
<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Vandana Miller/ Wilbur Bowne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Associate Professor/ Professor</td>
</tr>
<tr>
<td>Department</td>
<td>C&amp;J Nyheim Plasma Institute/ Surgery</td>
</tr>
<tr>
<td>Office Location</td>
<td>200 Federal Street, Camden, NJ/ NCB 7148</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215 571 4074</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:vam54@drexel.edu">vam54@drexel.edu</a></td>
</tr>
</tbody>
</table>

**Amount of time you are available for direct student supervision:**

20-30 hours/week

**Any specific skills or prior experience required:**

None

**Project Information**

*Please provide a title or a 2-3 sentence description of the research topic*

The research project will examine the modulation of immune cell function in response to the oxidative stress induced by non-thermal plasma, especially for immunotherapy of pancreatic cancer. The elucidation of markers of immunogenic cell death locally, in tumors, will be correlated with downstream induction of protective T cell responses systemically.
Faculty Sponsor: Andreia C. K. Mortensen
Title: Research Assistant Professor
Department: Pharmacology and Physiology
Office Location: 8810
Phone Number: (215) 762-4399
E-mail: acm83@drexel.edu

Amount of time you are available for direct student supervision:
1-2 hours/week

Any specific skills or prior experience required:
Pipetting and aseptic cell culture

Project Information
Please provide a title or a 2-3 sentence description of the research topic

Glutamate transport activation for neuroprotection

Glutamate transporters are essential to clear glutamate from the synaptic clefts and prevent disorders due to excitotoxicity. We have identified first in class positive allosteric modulators (PAMs) of glial Excitatory amino-acid transporter 2 (EAAT2) that directly increase glutamate transport rate and could be developed for therapies of several CNS disorders.

In this project we will utilize primary cultures of neurons and glia, and subject them to excitotoxic insults with either exogenous application of glutamate or with glucose deprivation (OGD), a model that induces large increases in extracellular glutamate concentration and produces neuronal degeneration. We will then apply the PAM compounds and evaluate cell death, using immunocytochemistry and ELISA approaches. We hypothesize that PAM administration will attenuate neuronal death induced by the insults.
2018 Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Patrick Osei-Owusu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Department</td>
<td>Pharmacology and Physiology</td>
</tr>
<tr>
<td>Office Location</td>
<td>Center City Campus, New College Building, Rm 8152</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215-762-4145</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:po66@drexel.edu">po66@drexel.edu</a></td>
</tr>
</tbody>
</table>

**Amount of time you are available for direct student supervision:**

As much as necessary to ensure efficient use of the student's time and effort.

**Any specific skills or prior experience required:**

The following skills are preferred but not required: experience in large data processing and analysis, experience in bright-field and fluorescence microscopy. Knowledge of using Microsoft Office programs, including word, excel, and power point.

**Project Information**

Please provide a title or a 2-3 sentence description of the research topic

The overall goal of the summer project is to assess whether sex is a risk modifier for pathologic cardiac hypertrophy, ventricular arrhythmia and death due to G protein signaling dysregulation. Experiments in this project will involve collection and analysis of several days worth of large sets of cardiac physiology and hemodynamic data. In addition, there will be opportunity to learn techniques in end-organ damage analysis using immunohistochemistry and histological approach, as well as bright-field and fluorescence microscopy.
## 2018 Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Dr. Juan L. Poggio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>Associate Professor of Surgery, Chief of Colon and Rectal Surgery</td>
</tr>
<tr>
<td><strong>Department</strong></td>
<td>Drexel Surgery</td>
</tr>
<tr>
<td><strong>Office Location</strong></td>
<td>NCB 7119</td>
</tr>
<tr>
<td><strong>Phone Number</strong></td>
<td>(215) 762-3430</td>
</tr>
<tr>
<td><strong>E-mail</strong></td>
<td><a href="mailto:jlp54@drexel.edu">jlp54@drexel.edu</a></td>
</tr>
</tbody>
</table>

### Amount of time you are available for direct student supervision:

2 hours/week, more by email

### Any specific skills or prior experience required:

Familiarity with basic statistical methods and analysis using excel a must. Experience with the SPSS statistics package highly encouraged. Be prepared for self-directed learning in biostatistical analysis.

### Project Information

*Please provide a title or a 2-3 sentence description of the research topic*

The incidence of anal intraepithelial neoplasia (AIN) is rising, as is screening and treatment of the disease. Prior statistical evaluation of our institution's patient data suggest screening intervals and treatment parameters with low post-operative infection rates, but further analysis is necessary to evaluate other post-operative complications, as well as the disease-free interval with relation to the stage of the disease. The medical student would be expected to expand our current database with new variables, and evaluate common statistical endpoints using either Excel or SPSS. He will be expected to have an abstract at the end of this period with the goal of submitting an article for a peer-review publication.
### Faculty Sponsor
Ramesh Raghupathi

### Title
Professor

### Department
Neurobiology and Anatomy

### Office Location
Room 277, Queen Lane campus

### Phone Number
215-991-8405

### E-mail
rr79@drexel.edu

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**Amount of time you are available for direct student supervision:**

5-6 hours a week

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**Any specific skills or prior experience required:**

Some bench experience would be preferred but not essential

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### Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

Our current data indicate that following a concussion, female rats and mice exhibit symptoms different from those in their male counterparts. These data support the clinical reports of concussion-induced deficits in adolescent boys and girls. The goal of the research is to determine optimal strategies to reverse these deficits using a combination of pharmacology and physical exercise. The focus for the summer is to determine if treatment with cannabidiol (an cannabinoid) reduces concussion-induced headache, cognitive deficits and impulsivity in both male and female mice. Treatment with cannabidiol will be augmented with daily bouts of physical exercise to determine if the efficacy of the pharmacologic intervention is altered.
## Medical Student Summer Research Fellowship Project List

<table>
<thead>
<tr>
<th>Faculty Sponsor</th>
<th>Todd Strochlic, V.M.D., Ph.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Department</td>
<td>Department of Biochemistry &amp; Molecular Biology</td>
</tr>
<tr>
<td>Office Location</td>
<td>New College Building - Room 11315</td>
</tr>
<tr>
<td>Phone Number</td>
<td>215-762-3664</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:tis35@drexel.edu">tis35@drexel.edu</a></td>
</tr>
</tbody>
</table>

**Amount of time you are available for direct student supervision:**

Approximately 25 hours/week

**Any specific skills or prior experience required:**

Basic skills in cell and molecular biology preferred but not required

## Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

Title: Characterizing the role of protein kinase CK2 in glioblastoma

The goals of this project are to investigate molecular mechanisms of activation of casein kinase 2 (CK2) in glioblastoma cell lines and to identify CK2-specific substrates that may be responsible for driving glioblastoma progression. Techniques that will be used for these experiments include cell culture, in-vitro kinase assays, SDS-PAGE, Western blotting, and immunofluorescence microscopy.
Amount of time you are available for direct student supervision:
As needed

Any specific skills or prior experience required:
While not absolutely necessary, preparation of solutions and pipeting skills are desired.

Project Information

Please provide a title or a 2-3 sentence description of the research topic
Effect of senescent astrocytes on neuronal homeostasis
Astrocytes are the most abundant cell type with critical roles in brain physiology and neuronal function. We have reported that human astrocytes activate the senescence program in response to oxidative stress, beta amyloid, exhaustive replication and HIV-highly active antiretroviral therapy. Interestingly, we have demonstrated that the population of senescent astrocytes increase in the human brain with age, and remarkably, more so in Alzheimer’s disease patients. The accumulation of senescent cells in the AD brain could be critical because senescent cells display the senescence-associated secretory phenotype (SASP), a complex mixture of cytokines and proteases that create a pro-inflammatory microenvironment that might profoundly affect neighboring cells and tissues. We have characterized the SASP in astrocytes and we have determined that p38MAP kinase is a key regulator of IL-6 secretion in senescent astrocytes. The proposal during the time frame of a summer rotation will evaluate the ability of SASP from senescent astrocytes to influence neuronal homeostasis including senescence, viability and neuronal degeneration. In addition, by using pharmacological inhibition or shRNA gene knocking down, the proposal will evaluate if the effects of SASP from senescent astrocytes on neurons can be reversed by p38 MAP kinase inhibition.
### Project Information

**Please provide a title or a 2-3 sentence description of the research topic**

Optical coherence tomography for the detection of prostate carcinoma.

We use optical coherence tomography (OCT) to image tissues in depth, producing three-dimensional renderings at nearly cellular resolution. The project is to use this microscope, in conjunction with specialized image analysis software that we have developed in the lab, to image excised prostate specimens, FFPE blocks, or prostate tissue phantoms for the detection of small tumor foci.
## Project Information

*Please provide a title or a 2-3 sentence description of the research topic*

Image analysis for the characterization of breast carcinoma.

Invasive breast cancer is a diverse disease that can be divided into at least 4 subtypes that describe the innate differences between them, and ultimately can be used to guide therapeutic decision making. Traditionally, breast tumor subtype is determined using molecular tools. We have data to suggest that the morphological characteristics of the histology can instead be used to delineate subtypes. This project would use image analysis software to examine whole-slide images of breast cancers with the intent to divide them into distinct morphological subtypes.