Summer Research on Aging-Related Topics
For Medical Students

December 8, 2015

Dear Medical Students,

The NYU School of Medicine Division of Geriatric Medicine and Palliative Care is excited to announce a new summer research program for medical students. The Division of Geriatrics will be offering 14 Research Assistant positions on aging-related research projects being conducted by faculty throughout the NYU School of Medicine. Students will be paired with a faculty mentor on an aging-related project of their choice. The Summer Research Program in Aging will run for a total of 9 weeks, beginning in June. During this time, students will attend weekly didactic sessions that focus on career development, basic research topics and key geriatrics topics. Students will also have the opportunity to gain exposure to clinical geriatric practice by shadowing a physician on a home visit, observing at the Bellevue Geriatrics Clinic, shadowing on the inpatient consult service at Tisch Hospital, visiting Gouvernour Healthcare Center, or observing a cognitive clinical examination. Students will have the opportunity to travel to the annual American Geriatrics Society meeting to present their research as a poster. All accepted students will receive a stipend of approximately $1,900 per month funded by the NIA.

The pages below contain information on projects offered through the Summer Research Program in Aging at NYU School of Medicine and details on how to apply through AFAR. We hope you find this opportunity as exciting as we do. We look forward to working with you to arrange for an educationally challenging and rewarding research experience.

Best of luck in your summer planning and we look forward to hearing from you!

Sincerely,

Caroline Blaum, MD, MS
Director, Division of Geriatrics and Palliative Care
NYU School of Medicine

Jennifer G. Adams, MD
Faculty Advisor, Internal Medicine Club
NYU School of Medicine

Steven B. Abramson, MD
Chair, Department of Medicine
Senior Vice President and Dean for Education, Faculty and Academic Affairs
How to Apply to the Summer Research Program in Aging:

The NYU Summer Research Program in Aging is one of seven National Training Sites that offer aging-related research projects to medical students. Applications are submitted to the American Federation for Aging Research (AFAR). The application form is brief and asks for biographical information and a short personal statement. NYU program administrators, Dr. Caroline Blaum and Victoria Brown, are available to help you with the application process.

Once you identify a project that is of interest, you should reach out to Dr. Blaum and/or Victoria. We will walk you through the application process and connect you with the faculty mentor for your project of interest.

Program Contacts:

Caroline Blaum, MD, MS  Victoria Brown, MPA
Director, Division of Geriatrics and Palliative Care  Senior Program Coordinator
Director, Summer Research Program in Aging  NYU School of Medicine
NYU School of Medicine  victoria.brown@nyumc.org
caroline.blaum@nyumc.org

A complete application form can be emailed to AFAR at medicalstudent@afar.org no later than January 25, 2016 at 5pm. Applications will be reviewed by the Summer Research Program in Aging advisory committee. Accepted students will be notified by March 1, 2016.
Summer Research Program in Aging: Projects and Faculty Mentors

**Faculty:** Caroline Blaum, MD, MS
Director, Division of Geriatrics and Palliative Care
caroline.blaum@nyumc.org

**Project Title:** Heart Failure in the Emergency Department – A Geriatrics and Palliative Care Approach

**Project Description:** This project recruits older adults who have come to the Tisch or Bellevue ED with heart failure. A brief geriatric and palliative care evaluation is done on all patients and, when available, their caregiver. Then the patient is followed for 90 days by chart review and telephone interview. The student will be an active part of a multidisciplinary research team, including geriatrics, nursing, cardiology, and ED; the student will participate in patient and caregiver recruitment and evaluation with an experienced research nurse; and will conduct patient follow-up and learn some data analysis. This project will result in an abstract for the student and the student will also contribute to publications and grant development based on this work. This is a great opportunity to get hands on experience with clinical research as well as to learn about heart failure, geriatrics and palliative care.

**Faculty:** Joshua Chodosh, MD, MSHS
Division of Geriatric Medicine and Palliative Care
joshua.chodosh@nyumc.org

**Project Title:** NYU Caregiver Integrated Support and Services Access Program (CISSAP)

**Project Description:** CISSAP is a New York State Department of Health services grant designed to provide support to family caregivers of persons with dementia utilizing and coordinating an array of resources. Work will cover all 5 boroughs of NYC. Care managers utilizing telehealth technologies will conduct caregiver assessments, address identified problems, and refer to appropriate agencies and services. Ongoing programmatic feedback is built into this program and will include caregiver surveys and ongoing discussions with community partners. The student will be an active part of a multidisciplinary implementation team, including geriatrics, psychology, social work, and nursing and will participate in caregiver recruitment and assessment with an experienced care manager (social worker). The student will conduct follow-up assessments and learn survey methodology, data collections and analysis. This project will result in an abstract for the student and the student will also contribute to publications and grant development based on this work. This is excellent opportunity to gain hands on experience with community-based implementation of collaborative care models as well as to learn about dementia and caregiving challenges.

**Project Title:** Hypertensive Control and Cerebral Blood Flow: When is Enough too Much?

**Project Description:** This is a pilot project to understand the risks and benefits of aggressive hypertensive care in patients who are 75 years and older. Patients on antihypertensive medications with systolic blood pressures less than 120 may be at increased risk for falls, fatigue, worse cognitive performance, poorer self-rated health and a lower self-assessed quality of life. A recent randomized trial suggests that patients with aggressive control of systolic blood pressure
have fewer adverse events including cardiovascular events and death. We will identify and recruit 20 individuals who are being treated for hypertension and have a documented systolic blood pressure of 120 or less. We will conduct patient assessments, which will include interview-administered measures of fatigue, cognitive performance, depressed mood, self-rated health, and quality of life. We will also conduct Transcranial Doppler studies to measure cerebral blood flow. After a reduction in blood pressure medication and a measured systolic blood pressure of >130, these study measures will be repeated. The student will be an active part of a multidisciplinary implementation team, including geriatrics, neurology, and nursing and will participate in subject recruitment and assessment with an experienced research assistant. The student will conduct follow-up assessments and learn measurement methodology, data collection and analysis. This project will result in an abstract for the student and the student will also contribute to publications and grant development for an NIH RO1 application based on this work. This is excellent opportunity to gain hands on experience with subject recruitment, consent and survey measurements. The student will also have the opportunity to learn about hypertension, hypertensive therapies, cognitive function and risk-benefit issues in geriatric care.

**Faculty:** John Dodson, MD
Geriatric Cardiology
john.dodson@nyumc.org

**Project Title:** Risk Stratification in Older Persons with Acute Myocardial Infarction - SILVER-AMI Study

**Project Description:** The overall objective of this study is to develop and validate risk stratification tools for older adults who have recently had an AMI, with the intent to use the knowledge from the data collected in SILVER-AMI to ultimately design interventions to improve the care and outcomes of older patients with AMI. Screening is done for men and women age 75 years and older hospitalized with an AMI. Enrolled participants will be assessed at baseline, prior to AMI hospital discharge through an interview, physical assessment and medical record review. Research and medical records will be transmitted to the SILVER-AMI Coordinating Center at Yale for data entry. The student will be an active part of this study, interfacing with physicians and patients. The student will take part in screening and enrolling patients, interviewing participants, carrying out participant physical assessments, and completing medical record abstractions of pertinent information. This is a great opportunity to get hands on experience with patients and clinical research.

**Project Title:** Evaluating Physical Function Trajectories Pre- and Post-Transcatheter Aortic Valve Replacement

**Project Description:** Transcatheter aortic valve replacement (TAVR) has emerged as a treatment option for patients with symptomatic severe aortic stenosis (AS) at high operative risk. Patients undergoing TAVR are typically of advanced age with a high degree of comorbidity, and are vulnerable to multiple adverse outcomes including hospital readmission and death. Low physical activity in the perioperative setting may be associated with these poor outcomes, but has traditionally been difficult to quantify outside of the hospital setting. This study seeks to use new mobile health technology to measure physical activity of TAVR patients in the pre and postoperative setting. In addition to wearing activity monitors, enrolled
participants will be assessed at baseline, prior to TAVR procedure, and at their follow-up visit post-procedure, through questionnaires, physical assessments and medical record review. The student will help screen for eligible patients in the heart valve clinic, enroll and interview participants, and carry out participant physical assessments. This is a great opportunity to gain experience with patients in a clinical environment.

Faculty: Corita Grudzen, MD
Emergency Medicine
corita.grudzen@nyumc.org

Project Title: Palliative Care Needs Assessment of Emergency Department Patients with Serious Illness

Project Description: We conduct a palliative care needs assessment (survey based) of patients with serious illness (advanced cancer, heart failure, oxygen-dependence, and ESRD/CKD Stage 5, and/or on dialysis) who present to the Emergency Department (ED). Because the ED presents a key decision point in which providers set the course for the subsequent trajectory and goals of care for patients with serious illness, many of whom are un- and underinsured, we believe that ED-based research on the integration of palliative and emergency care is essential. In order to meet our goal of understanding the palliative care needs of said patients, we must first know which ED patients could benefit from emergent palliative care services and what their palliative care needs are. To that end, the long-term goal of this study is to better integrate palliative and emergency care for patients with advanced illness by developing a sustainable and effective model for ED-based palliative care delivery. We predict that better matching of patients’ goals of care to treatments would not only result in better concordance of ED disposition with patients’ preferred site of care, but might also decrease ICU admissions at the end of life and increase referrals to hospice. The summer student will be an active part in recruitment. The student will also participate with cleaning and coding data obtained throughout the summer. Preliminary analysis may be able to take place from the tools used for data collection dependent on the interest of the student.

Faculty: Leora Horwitz, MD, MHS
Director, Center for Healthcare Innovation and Delivery Science
Director, Division of Healthcare Delivery Science
leora.horwitz@nyumc.org

Project Title: The NYU Patient Imaging Quality and Safety Laboratory (PIQS Lab)

Project Description: The NYU Patient Imaging Quality and Safety Laboratory (PIQS Lab) is an AHRQ-funded Patient Safety Laboratory based in NYULMC’s Department of Population Health and Department of Radiology. The PIQS Lab is a multidisciplinary laboratory that joins clinicians with operations, management, design and human factors experts to improve the safety and quality of radiologic imaging and procedures for outpatients and inpatients. Numerous potential research opportunities exist, from qualitative studies of overuse and adverse events, to evaluation of redesign activities.
Project Title: The Greater New York City Practice Transformation Network  
Project Description: The Greater New York City Practice Transformation Network (GNYC-PTN) is a CMMI-funded collaborative to redesign ambulatory care in dozens of practices throughout New York City, including federally qualified health centers, private practices and academic NYU clinics. Specific areas of focus include patient satisfaction, cost/utilization and quality including several measures explicitly targeted at older adults (e.g. use of high risk medications, avoidance of hospitalization, receipt of pneumococcal vaccination etc.). Students are welcome to participate in redesign work.

Faculty: Scott Sherman, MD, MPH  
Co-Director, Section on Tobacco, Alcohol and Drug Use  
scott.sherman@nyumc.org

Project Title: Proactive Mental Health  
Project Description: In previous studies, we showed that we can help smokers with mental health disorders to quit smoking and also that we can reach out proactively to smokers in primary care and help them to quit smoking. In this study, we have combined both of these two approaches and are reaching out proactively to smokers with mental health disorders at four VA Medical Centers (New York, Minneapolis, Houston and Tampa). We have already enrolled 1,900 smokers across the four sites and are now conducting follow-up telephone interviews. Given the VA population, many of the patients are over age 65. We anticipate that the summer student would help conduct follow-up telephone interviews and write a paper using data from the study.

Project Title: Oral Microbiome and Smoking  
Project Description: Smoking is the leading cause of oral cancer, although the mechanism for this association is not clear. The oral microbiome differs greatly between smokers and non-smokers, and may provide a mechanism for this increased cancer risk. In this explanatory study, we are collecting saliva from patients in an ongoing smoking cessation study and determining whether: 1) changes in smoking status lead to changes in oral microbiome and 2) determining whether the oral microbiome is associated with differences in levels of oral mutagens and carcinogens. We anticipate that the summer student would help recruit participants from the Manhattan VA Hospital (where many of the patients are over age 65) and write a paper using data from this study or other studies.

Faculty: Joseph Ravenell, MD, MS  
Center for Healthful Behavioral Change  
joseph.ravenell@nyumc.org

Project Title: Program to Understand Barriers to Low Enrollment of Black Men in Clinical Trials  
Project Description: The goal of this study is to address low recruitment and retention of black men into clinical trials by elucidating and evaluating factors that serve as barriers and facilitators for their enrollment in clinical trials. This investigation will be a qualitative, non-interventional hypothesis-generating study.
**Faculty:** Girardian Jean-Louis, Ph.D.
Professor of Population Health and Psychiatry
Center for Healthful Behavior Change
[contact information]

**Project Title:** *Chronic Moderate Sleep Restriction in Older Long and Older Average Sleepers*

**Project Description:** The aims of this study are to examine the ability of older long sleepers and older average sleepers to adhere to 60 min TIB restriction; and to contrast effects of 12 weeks of 60 min TIB restriction on health-related measures in older long vs. average sleepers. One hundred older adults (ages 60-80 years) who report sleeping ≥ 8 hours per night and 100 adults of the same age range who report sleeping 6-7.25 hours per night will be examined at 4 experimental sessions. Following a 2-week baseline, participants will be randomly assigned to one of two 12-week treatment groups. (1) A sleep restriction group (n=60 long sleepers and n=60 average sleepers) will be assigned to a fixed sleep-wake schedule, in which time in bed is reduced precisely 60 min below each participant’s baseline TIB. (2) A control group (n=40 long sleepers; n=40 average sleepers) will have no sleep restriction, but will also follow a fixed sleep schedule. Sleep will be assessed continuously with actigraphy and a daily diary. Questionnaires will be answered via a study web site. Measures will include body weight, glucose tolerance, sleepiness, depression, quality of life, psychomotor vigilance, incidence of automobile accidents, incidence of upper respiratory illness, and multiple markers of inflammation. Physical exams during weeks 2 and 6 of the intervention and a study Ombudsman will further monitor potential adverse effects. The proposed clinical trial will provide the most comprehensive Phase 1 assessment of risks and benefits of chronic moderate TIB restriction. The student will assist in calls to describe the study to interested participants and carry out screening interviews to determine eligibility into the study. The student will gain experience interacting both over the phone and in person with participants in a clinical trial.

**Project Title:** *Psychosocial and Environmental Determinants of Insufficient Sleep*

**Project Description:** Compelling evidence shows racial/ethnic disparities in insufficient sleep. Blacks have a three-fold greater risk of insufficient sleep compared with whites. The rationale for this feasibility study is that acquisition of these preliminary data will provide a basis for a multiyear, NIH-funded study to ascertain the psychosocial (social network and psychological health) and environmental determinants (social capital, neighborhood, and built environment) of insufficient sleep. The long-term goal is to support implementation of interventions to mitigate the negative impact of psychosocial and environmental determinants on insufficient sleep among blacks, thereby reducing risk of cardiovascular disease in this low-income and underserved population. This multi-disciplinary research team will investigate the following aims: 1) To assess the prevalence and severity of insufficient sleep among blacks using home-based sleep recording instruments; 2) To assess metabolic factors (e.g., obesity, blood pressure, blood sugar level, lipid profile, and C-reactive protein) that are associated with insufficient sleep; 3) To identify psychosocial (social network and emotional distress), health behavior (physical activity, diet, and sleep habits) and environmental factors (social capital, neighborhood, social economic status and built environment) that are associated with insufficient sleep. The student will conduct calls to pitch the study to participants, interview participants, and perform data entry on
REDCap. This is a great opportunity to experience the underlying process of conducting a small pilot study.

**Faculty:** Simona C. Kwon, DrPH, MPH  
Center for the Study of Asian American Health  
simona.kwon@nyumc.org

**Project Title:** Understanding Health Disparities in Asian American Older Adults  
**Project Description:** The NYU Center for the Study of Asian American Health (CSAAH) is a National Institutes of Health (NIH) National Institute on Minority Health and Health Disparities (NIMHD) funded National Research Center of Excellence. It is based in the Section for Health Equity within the Department of Population Health at NYU School of Medicine. Established in 2003, CSAAH is the only Center of its kind in the country that is solely dedicated to research and evaluation on Asian American health and health disparities. CSAAH is committed to identifying Asian American health priorities and reducing health disparities by integrating and building on the work of researchers and over 55 Asian American community, government, business and academic/medical partners. Since 2014 CSSAH has been developing its research initiative on Asian immigrant older adults by exploring existing data sets and conducting primary data collection in partnership with community-based organizations and leaders serving the Asian immigrant communities. The student will be an active participant working with multi-disciplinary researchers and community partners to identify gaps in the literature via systematic literature reviews, and health disparities and priorities using primary and secondary data sources focused on Asian immigrant older adults in New York City using a social determinants of health lens.

**Faculty:** Chau Trinh-Shevrin, DrPH  
Section for Health Equity  
chau.trink@nyumc.org

**Project Title:** Understanding and Addressing Disparities in Mental Health Care and Disability Prevention for Minority Older Adults  
**Project Description:** The Positive Minds–Strong Bodies Study is funded by the National Institute of Mental Health and the National Institute of Aging with the purpose of addressing disparities in mental health and risk for disability among minority elders through building collaborative research and community capacity to provide and test mental health and disability prevention interventions in community-based organizations (CBOs) that serve ethnic minority elderly clients. Central to the approach is the development of partnerships that promote mutual understanding between the people who produce the treatment and the people who use them. This study is led by the NYU Center for the Study of Asian American Health and the Massachusetts General Hospital. Potential activities for a summer student include conducting a literature review to further understand the disparities in access to care and quality of care in mental health services and disability prevention among minority older adults using a social determinants of health lens, identify gaps in the literature related to mental health care and preventing disability among minority older adults, and further explore the role of community capacity building and
collaborative research in addressing disparities in mental health and risk for disability and providing treatments for minority older adults.

**Faculty:** Martin Sadowski, MD, PhD
Departments of Neurology, Psychiatry, and Biochemistry & Molecular Pharmacology
marcin.sadowski@nyumc.org

**Project Title:** Diagnosis of Dementia and Cognitive Deficit Using Computerized Speech Analysis
**Project Description:** The goal of this project is to advance computerized speech analysis algorithm and test its sensitivity to distinguish speech of Alzheimer’s patients from these of age matched cognitively normal controls and other forms of dementia.

**Project Title:** Dynamic Model of Alzheimer’s Disease Risk Throughout the Lifespan
**Project Description:** The goal of this project is to develop a statistical algorithm allowing for precisely determining individual risk of Alzheimer’s disease through the lifespan based on one’s genetic background and acquired risk factors.

**Faculty:** Ravichandran Ramasamy, PhD
Diabetes Research Program, Division of Endocrinology, Diabetes and Metabolism
ravichandran.ramasamy@nyumc.org

**Project Title:** Glucose Metabolism and Mechanisms of Cardiac Aging
**Project Description:** Comprehensive analysis of clinical and preclinical studies reveals that the major factor underlying the risk of cardiovascular diseases in human subjects is advancing age. Innate dysfunction in the aging cardiovascular system in the vascular arterial structures and myocardium, in part, primes aging subjects for increased risk to superimposed stresses, including ischemia/reperfusion (I/R) injury. Our preclinical research focuses on dysregulated glucose metabolism, defined as glucose metabolism by pathways such as polyol pathway that does not lead to energy production, rather cofactor consumption, in part, leads to cardiac abnormalities. Our studies are built on the discovery that in conditions which exacerbate cardiovascular stress, advanced age, and I/R, hearts display (a) reduced NAD+ dependent sirtuin SIRT1 activity, and (b) increased acetylation of metabolic, transcriptional, and oxidant stress proteins. Importantly, our preliminary studies in our laboratory demonstrate that the activity of cardiac aldose reductase (AR; a key regulatory enzyme in the substrate flux via the polyol pathway) is increased in aging hearts, while NAD+/NADH ratio, NAMPT (nicotinamide phosphoribosyltransferase, a mechanism to generate NAD+) and NAD+ dependent SIRT1 activity and expression are reduced. Furthermore, our data demonstrate that dysregulated glucose metabolism leads to increases in acetylation of glycolytic enzymes and altered signaling via hypoxia responsive transcription factors. These data led us to hypothesize that dysregulated glucose metabolism modulates increased vulnerability in aging hearts to I/R injury, in part by acetylation-dependent mechanisms. Our research projects are aimed to determine how (1) increases in acetylation of glycolytic enzymes in aging hearts are due, in part, to decreased expression of histone deacetylases, specifically NAD+ dependent SIRT1, and/or decreased availability of NAD+ for
SIRT1 activity, (2) increases in acetylation lead to increased oxidative stress in aging hearts, and (3) dysregulated glucose metabolism and/or SIRT1 activity drives acetylation of nuclear transcription factor Egr-1 and consequent induction of genes linked to fibrosis in aging hearts. Our overall goal is to determine how dysregulation of glucose metabolism, along with impaired metabolic rescue, impacts actions of molecules modulating energy metabolism, transcription, and oxidative stress in aging hearts. Uncovering of the dysregulated glucose metabolism driven mechanisms will lead to discovery of novel targets for the protection of aging hearts.

**Faculty:** Thomas Wisniewski, MD and Eleanor Drummond, PhD
Center for Cognitive Neurology
thomas.wisniewski@nyumc.org

**Project Title:** *Proteomic Analysis of Alzheimer’s Disease and Control Brains*

**Project Description:** Proteomics of human Alzheimer’s disease (AD) brain tissue has been difficult to do due to limited tissue availability and limited methodology. To address these problems, we have developed a novel technique that allows unbiased proteomic analysis using very small amounts of tissue microdissected from formalin-fixed paraffin embedded (FFPE) tissue, which is the most available type of human tissue specimens. This technique allows quantification of thousands of proteins at once using very small tissue samples and is therefore very useful for answering specific questions about the many protein pathways involved in AD. The overall goal of this project is to identify the comprehensive protein signature of AD by specifically examining vulnerable cell types and pathological features that define AD by performing a proteomic screen, which will ultimately help develop effective therapies. The two aims of my work during this fellowship are: (1) to determine what proteins are significantly altered in neurons and microglia in selectively vulnerable brain regions during the progression of AD, and (2) to determine what proteins are involved in the development of amyloid plaques and neurofibrillary tangles.

**Project Title:** *Treatment of AD Transgenic Mice with Aβ Oligomer Binding Compound (BDO-1)*

**Project Description:** We have developed a fluorescent probe that specifically binds Aβ oligomers (Journal of the American Chemical Society, 137(42):13503-9, 2015). Aβ oligomers are thought to be the most toxic species of Aβ in Alzheimer’s disease. We are testing the hypothesis that these compounds will have a therapeutic effect by binding to Aβ oligomers and therefore preventing their toxicity in AD transgenic mice. This involves behavioral, neuropathological, and biochemical studies.

**Faculty:** Thomas Wisniewski, MD and Henrieta Scholtzova, MD, PhD
Center for Cognitive Neurology
thomas.wisniewski@nyumc.org

**Project Title:** *Testing of Innate Immunity Stimulation via TLR9 on CAA using Non-human Primates*

**Project Description:** We aimed to evaluate the most effective and non-toxic vaccination protocol to reduce CAA accumulation in our aged monkeys (18-19 years of age), at a point
where CAA is already present. Treatment begun at later stages will be more clinically relevant, since AD patients have substantial pathology by the time clinical symptoms are evident. Female adult squirrel monkeys are subcutaneously injected every 2 or 4 weeks with a predetermined optimal dosages of TLR9 agonist CpG ODN or vehicle (saline) for a 25 month period. Animals are continuously examined for signs of toxicity, and body weights were recorded at biweekly intervals. Injection site reactogenicity of repeated injections was monitored. Plasma and CSF samples are analyzed to identify immune responses and potential biomarkers associated with disease progression and/or treatment efficacy. Plasma samples are taken at specific times in the course of treatment and CSF samples were collected at sacrifice. Our adult monkeys underwent cognitive behavioral testing prior to treatment and in the final months of treatment as a longitudinal follow up. We designed novel cognitive tests which allowed us to further develop behavioral assessment of squirrel monkeys. Behavioral studies are completed and the old primates were euthanized for the analyses of brain pathology. Final histological and biochemical analyses in our old monkeys commenced upon completion of the immunization and behavioral protocols remain to be performed.

**Faculty:** Martin J. Blaser, MD  
Director, Human Microbiome Program  
[mailto:martin.blaser@nyumc.org](mailto:martin.blaser@nyumc.org)

**Project Title:** *Microbial Contributions to the Atherosclerosis of Aging*  
**Project Description:** This will involve studies in mouse models of metabolic disease with assessment of abnormal gene expression.

**Faculty:** Bruce Cronstein, MD  
Director, NYU-HHC Clinical and Translation Science Institute  
Director, Division of Translational Medicine  
[mailto:bruce.cronstein@nyucm.org](mailto:bruce.cronstein@nyucm.org)

**Project Title:** *The Role of Adenosine in Regulation of Cartilage Homeostasis*  
**Project Description:** Osteoarthritis is one of the most common medical problems facing Americans today. It affects up to 27 million people in the United States and the prevalence of osteoarthritis increases with age. The costs of treating osteoarthritis have been estimated to account for up to 0.5% of the GDP. Chondrocytes are the cells that manufacture and maintain cartilage, the structure within the joint that is most directly affected in osteoarthritis and in recent experiments we have observed that adenosine, acting at one of its receptors (the A2A receptor), plays a role in helping to maintain chondrocyte and cartilage homeostasis. The experiments that a student could participate in include assessments of the effect of adenosine receptor stimulation on chondrocyte function. We expect that these cell culture experiments will provide an excellent project for an interested student.