Summer Research Assistantships (SRAs) are available to students in Brown University’s Program in Liberal Medical Education (PLME) annually on a competitive basis. PLME students who are awarded a SRA receive a stipend of $3,500, and the opportunity to become engaged in a summer research project under the supervision and mentorship of a Brown faculty member.

A faculty mentor must be a faculty member in the Division of Biology and Medicine, School of Public Health, or on clinical faculty to mentor a student for the PLME SRA.

PLME students may secure research opportunities in the following ways:

- Identifying an area of research that is of interest to you, and finding a Brown faculty member conducting research in that field who would be willing to serve as your faculty mentor
- Identifying a Brown faculty member who would be willing to sponsor your own research project
- Reviewing the list of research opportunities in this packet to see if any projects are of interest to you. All the faculty mentors in this packet have indicated that they would be interested in mentoring a PLME student for a SRA from June to August 2018.

For additional information on the SRA, please visit the PLME SRA website:

https://www.brown.edu/academics/medical/plme/current-students/enrichment-activities/research-opportunities/plme-summer-research-assistantship-soc

Dave Barnes
PLME Coordinator
david_barnes@brown.edu
401-863-9790

Judy Jang, MD
Program Director, PLME Summer Research Assistantship
Assistant Dean of Medicine, PLME Advising
judy_jang@brown.edu
Faculty Mentor: Abbott R. Laptook, MD

E-mail: alaptook@wihri.org

Description of Project:

Preliminary studies to assess brain cortical activity in response to stimuli of newborn infants of two groups: 1) infants with hypoxia-ischemia and 2) preterm infants who can be assessed serially in the Neonatal Intensive Care Unit.

SRA Research Subject Area: Clinical Research

Are there any necessary requirements for the student to apply? If so, please state:

Good people skills for interfacing with family members, obtaining consent etc

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Weekly meetings in my office or the NICU. This work will be done in collaboration with Dima Amso who will also play a role in mentoring.

Department: Pediatrics

Other Comments:

These will be pilot studies that we hope to have a protocol developed and with IRB approval by the summer.
Faculty Mentor: Ruhul Abid, MD

E-mail: Ruhul_Abid@brown.edu

Description of Project:

I have two major projects: 1. Coronary blood vessel growth in ischemic myocardium. 2. Global healthcare projects delivering healthcare and humanitarian assistance to the refugees from Myanmar.

SRA Research Subject Area: Basic Science Research, Global/public health in a developing country in Asia

Are there any necessary requirements for the student to apply? If so, please state:

For basic research, either cell culture/PCR, or animal work experience. For Global Health, either motivation to work in a challenging setting or data analysis experience.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Once a week at my office at Rhode Island Hospital (Coro West building).

Department: Cardiothoracic Research Center

Other Comments:

Email with your interests and a CV.
Faculty Mentor: Wael Asaad, MD, PhD

E-mail: wael_asaad@brown.edu

Description of Project:

Students have the opportunity to work on any of a variety of human cognitive neuroscience and neurophysiology studies, ranging from intra-operative single neuron recordings from the basal ganglia, to the effects of laser capsulotomy for intractable OCD or amygdalohippocampotomy for epilepsy, to psychophysics in cognition and movement disorders. Students with strong coding and quantitative skills may also participate in data analysis from large arrays implanted in the nonhuman primate prefrontal cortex. Projects will be tailored to a student's interests and skills.

SRA Research Subject Area: Basic Science Research, Clinical Research

Are there any necessary requirements for the student to apply? If so, please state:

High level of enthusiasm; strong quantitative background and coding skills are very helpful.

What is your plan for mentoring a student researcher (i.e., how often will you meet with the student, when, where)?

Typically we will meet at least once per week, and more have more constant communication through Slack.

Department: Neurosurgery & Neuroscience

Other Comments:

Thank you for the opportunity to participate in this program. Have had a great experience with PLMEs in the past (and currently in the lab)!
Faculty Mentor: Nicholas Asselin, DO

E-mail: nicholas_asselin@brown.edu

Description of Project:

Research assistants with work with the RIPCORD (Rhode Island Prehospital Cardiac arrest Outcomes Registry Development) team to create and analyze EMS out of hospital cardiac arrest data. We will evaluate the impact of prehospital interventions on OHCA patient outcomes in RI. Duties will include IRB interactions, project development, chart abstraction, data analysis, statistical planning and dissemination of findings via Abstract/Poster/Oral Presentation and publication as an author.

SRA Research Subject Area: Health Policy, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

EMS experience preferred, but not required

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

The research assistant will be included in IRB/statistical planning, as well as abstract/manuscript preparation and submission. We will include supervised training in chart abstraction and data collection, as well as duel chart abstraction to confirm data fidelity. We will meet in person weekly during the experience to discuss inclusion/exclusion questions and adjudicate charts. We will we available via phone/email for any immediate questions.

Department: Emergency Department
Faculty Mentor: Nicholas Asselin, DO

E-mail: nicholas_asselin@brown.edu

Description of Project:

The research assistant will assist the principal investigator in querying an existing IRB-approved prehospital database called SCREEM (System for Cohort Recruitment through EMS and EHR data Mining). We will identify cases where prehospital naloxone was documented and evaluate the impact of widespread bystander naloxone on the EMS care of these patients. We will be searching the database, identifying cases where bystander (vs. first responder vs. EMS) naloxone is given to patients. Descriptive characteristics, patient disposition and (pending IRB expansion) patient outcomes will be assessed. Duties will include IRB interactions, project development, chart abstraction, data analysis, statistical planning and dissemination of findings via Abstract/Poster/Oral Presentation and publication as an author.

SRA Research Subject Area: Health Policy, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

EMS experience preferred, but not required

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

The research assistant will be included in IRB/statistical planning, as well as abstract/manuscript preparation and submission. We will include supervised training in chart abstraction and data collection, as well as duel chart abstraction to confirm data fidelity. We will meet in person weekly during the experience to discuss inclusion/exclusion questions and adjudicate charts. We will we available via phone/email for any immediate questions.

Department: Emergency Department

Nicholas Asselin, DO
**Faculty Mentor:** Joseph Bliss, MD, PhD

**E-mail:** jbliss@wihri.org

**Description of Project:**

We are interested in the host-pathogen interactions that lead to disseminated infections with the yeast, Candida. The project would involve helping to establish a mouse model for gastrointestinal colonization and dissemination.

**SRA Research Subject Area:** Basic Science Research

**Are there any necessary requirements for the student to apply? If so, please state:**

Prior experience with research involving mice desired, but not essential if willing to learn.

**What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?**

I will be directly involved in the initial animal experiments and am available to meet formally at least weekly.

**Department:** Pediatrics
Faculty Mentor: Ghada Bourjeily, MD

E-mail: Ghada_bourjeily@brown.edu

Description of Project:

Our research program focuses on the understanding of the association of disordered breathing during sleep and adverse pregnancy and neonatal outcomes. The research is an intersection of medical specialties in the obstetric population. Our currently funded programs aim to understand mechanisms underlying the development of adverse outcomes and clinical and physiologic factors that may predict the development of new onset sleep disordered breathing during pregnancy.

SRA Research Subject Area: Clinical Research, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

Some experience in research or writing would be most desirable but willing to train student if unexperienced.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I am happy to meet with the student before the summer starts to discuss potential project and plan and expectations. I usually also meet periodically (every couple of weeks or so) with trainees and review their progress. We also meet as needed as questions come up and communicate via email frequently. Other members of my lab are also available to help answer technical / logistical questions or academic questions if I am not immediately available.

Department: Biomed, Medicine
Faculty Mentor: Shibin Cheng, Md, PhD

E-mail: Shibin_Cheng@brown.edu

Description of Project:

Decipher signaling mechanisms underlying adverse pregnancy complications, such as pre-eclampsia and preterm birth, and characterize the roles of protein aggregation, unfolded protein response, ER stress and inflammasome in adverse pregnancy outcomes.

SRA Research Subject Area: Basic Science Research, Clinical Research

Are there any necessary requirements for the student to apply? If so, please state:

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Department: Pediatrics
2019 SRA Biomed Research Opportunities

Faculty Mentor: Shawna Cutting, MD

E-mail: shawna.cutting@lifespan.org

Description of Project:
The exact nature of the project depends on the student's interest. Most of the work I do is in imaging within cerebral vascular disease

SRA Research Subject Area: Clinical Research, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I would be able to meet with the student at least once but usually twice weekly

Department: Neurology
**Faculty Mentor:** Carsten Eickhoff, PhD

**E-mail:** carsten@brown.edu

**Description of Project:**

The project aims at developing algorithmic decision support for rare disease diagnostics. Machine learning, information retrieval and natural language processing techniques will be used to process millions of scholarly biomedical articles as well as thousands of electronic health records with the goal of a) isolating diagnostic evidence and b) aggregating the evidence into a differential diagnosis.

**SRA Research Subject Area:** Basic Science Research, Computer Science, Machine Learning

**Are there any necessary requirements for the student to apply? If so, please state:**

Basic programming experience

**What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?**

We will hold weekly 1:1 meetings at BCBI. The student will be part of my lab's weekly meetings and workspace at BCBI is available as well.

**Department:** Brown Center for Biomedical Informatics
Faculty Mentor: Mary Flynn, MD

E-mail: Mary_Flynn@brown.edu

Description of Project:

A 4-week cooking program of plant-based, olive oil recipes for low-income patients from a medical clinic and an oncology clinic (survivors), with follow-up for clinical measures. Student will learn how to provide diet information that is designed to improve risk factors for chronic diseases and how changes in diet will improve health.

SRA Research Subject Area: Clinical Research, Medical Education/Patient Education, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

Academic qualifications: completion of at least one college level nutrition course preferred; completion of CITI training or willingness to do so for anyone taking this assistantship. Some work with low-income populations would be preferred but not req

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I would plan to meet at least weekly to monitor the student's work in the program and to answer any questions, besides being involved in all the activities the student will be doing. All students will be trained by me. The student would also work with me in the clinics in the recruitment process.

Department: Biomed
Faculty Mentor: Monica Garcia-Solache, MD, PhD

E-mail: monica_garcia_Solache@brown.edu

Description of Project:

The project will be on antibiotic resistance mechanisms in enterococci. Mostly focusing on evolutionary paths of resistance to beta-lactams and the contingencies that limit these paths to achieve resistance while keeping fitness.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

Basic microbiology and molecular biology. Some bioinformatics would be a plus

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

As a lab-based scientist I would be able to meet the student on a daily basis for training and problem-solving and on weekly more structured meetings to discuss progress, plans and goals.

Department: Medicine
Facility Mentor: Natasha Gill, MD

E-mail: natashagill1@gmail.com

Description of Project:

Pediatric Disaster Preparedness at Rhode Island Hospital: Evidence shows that children display higher mortality rates and are disproportionally affected during all types of disasters due to their poor motor skills and lack of self-preservation and cognitive skills compared with adults. In a recent survey conducted by National Pediatric Readiness Campaign that evaluated 5,000 U.S. hospitals regarding access to proper pediatric equipment, pediatric training, and resources to manage day-to-day pediatric patients, Rhode Island (RI) hospitals scored poorly. This is concerning because most RI community hospitals would defer care to Hasbro Children’s Hospital, which is the only Level 1 trauma center in the state and would bear the highest patient burden during a pediatric disaster. This study aims to assess the effectiveness of focused pediatric disaster modules in increasing physician knowledge and ability to demonstrate successful implementation of core action steps essential to a pediatric disaster response using focus groups, surveys, and real time simulations.

SRA Research Subject Area: Clinical Research, Medical Education/Patient Education, Health Policy, Quality Improvement

Are there any necessary requirements for the student to apply? If so, please state:

Organized. Good with excel and powerpoint. Comfortable with survey design, focus groups, and simulations. Creating and editing educational videos. Interest in disaster preparedness and pediatrics. Writing research papers.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I plan to be hands on. I can meet or chat with the student several times per week as needed. I live in Providence and am completing an MPH at Brown so I can meet on campus or at Hasbro hospital.

Department: Pediatric Emergency Medicine

Other Comments:

This project has been grant funded, but initial budgeting did not include student fees. I may have partial funding for a student.
Faculty Mentor: Chiung-Kuei Huang, PhD

E-mail: chiung-kuei_huang@brown.edu

Description of Project:
The goal of our study is to clarify the molecular pathogenesis of liver cancers. Accomplishment of our goals is expected to establish potential therapeutic targets in treating patients with liver cancers.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Daily

Department: Medicine

Other Comments:
The funding is for supplies and materials to be used for the proposal but not for student stipend.
Faculty Mentor: Jisu Li, MD, PhD

E-mail: ji_su_li_md@brown.edu

Description of Project:
The project will study hepatitis B virus (HBV) infection in cell culture models. In particular, we will study host proteins involved in HBV life cycle, which would serve as novel antiviral targets.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:
like and good at hands on work.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?
Meet with the student daily in the lab. The student will learn research skills, scientific thinking and problem solving.

Department: Medicine
Faculty Mentor: George Lisi, PhD

E-mail: george_lisi@brown.edu

Description of Project:

Investigations of the effect of cellular redox conditions on the structure and dynamics of macrophage migration inhibitory factor (MIF). MIF is critically involved in regulating the pro-inflammatory response, and is a drug target for asthma and arthritis therapies. Students would prepare recombinant protein samples for NMR spectroscopic studies of the MIF structure and carry out biochemical assays of MIF activity under various conditions.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

Experience in biochemistry, protein preparation would be a plus

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I will meet with the student at least once per week during group meetings, and I actively work in the laboratory and will most likely personally train the student

Department: Molecular Biology, Cell Biology & Biochemistry
Faculty Mentor: Megan Ranney, MD, MPH

E-mail: megan_ranney@brown.edu

Description of Project:

The student could work on either (a) the randomized controlled trial of my text-message intervention, iDOVE2, to prevent violence and depression among at-risk adolescents seen in the ED; or (b) one of my ongoing gun violence research projects.

SRA Research Subject Area: Clinical Research, Health Policy, Epidemiology, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

Required: • Highly organized, outstanding attention to detail and ability to multi-task, self-motivated, ethical • Able to think on feet • Strong interpersonal skills: ability to interact well with patients in a clinical setting and quickly develop rapport

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

The student will be part of my larger research team, including my Emergency Digital Health Innovation program staff. As such, my student will benefit from extensive mentorship from not only myself, but also from my graduate-level students and research assistants.

Personally, I will meet with the student in person on at least a weekly basis (more frequently at the start of the summer) to discuss their questions and progress with the project. I will provide the student with tailored readings to enhance his or her own academic development. I will review weekly reflection papers and offer the student the opportunity to complete an independent sub-project as well.

Finally, I organize a summer journal club each summer – in conjunction with the Brown Center for Bio-Informatics - for SRA students, to teach basic research methodology, and will engage the student in this weekly event.

Department: Emergency Medicine

Megan Ranney, MD, MPH
Faculty Mentor: Sean Monaghan, MD

E-mail: smonaghan@lifespan.org

Description of Project:

As a trauma surgeon I try to understand alternative RNA splicing in my critically injured patients. My research is done by analyzing RNA sequencing data from humans as well as a murine model. Clinical research opportunities are also available.

SRA Research Subject Area: Basic Science Research, Clinical Research, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

For the RNA splicing research, programming skills in R is very useful.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Plan for mentoring would include weekly individual meetings as well as lab meetings with collaborators as appropriate. Mentoring after the summer will continue as needed.

Department: Surgery
Faculty Mentor: Alan Morrison, MD, PhD

E-mail: alan_morrison@brown.edu

Description of Project:
Coronary artery calcification of atherosclerotic plaque is associated with increased mortality in patients. We have a database of about 1000 CT scans from the Providence VA that have been scored for coronary and aortic valve calcium along with 4-years of outcomes. We can design a number of interesting questions to identify unique risk factors associated with increased calcification and higher mortality. We can also look at markers of resilience in patients as well. Will design study around student's interest.

SRA Research Subject Area: Clinical Research, Epidemiology, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:
No experience necessary, just a willingness to learn. Will train in basic statistical methods.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?
Meet one on one once per week. Daily meetings with the research fellow on the front lines. Weekly lab meetings and weekly research seminars in the research center. Expectation is that the student will present one poster abstract at a national conference and work on authoring a manuscript based on their study.

Department: Medicine/Cardiology
Faculty Mentor: Alan Morrison, MD, PhD

E-mail: alan_morrison@brown.edu

Description of Project:
We study molecular mechanism of vascular calcification. Calcification is associated with higher mortality in patients. We have begun defining a macrophage signaling pathway that is critical to promoting atherosclerotic calcification in animal models of disease. We have several new mice strains with mutations in this pathway and are currently studying the resultant phenotypes. Students will be paired with a postdoctoral fellow and/or graduate student and will be provided with a series of experimental analyses of one of these novel knockout mice.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:
Some basic experience in basic science research. Interest in learning western blotting, ELISA, immunology, immunofluorescence microscopy, and/or basic molecular techniques. Willingness to learn and general interest in vascular biology.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?
Summer experiments are designed to be simple and completed by the end of the research program. Weekly one-on-one meetings with the faculty mentor. Daily interactions with graduate students and postdoctoral fellows on the front lines. Weekly lab meetings and research center seminar meetings. Students will be able to put a poster together and participate in co-authorship of a manuscript related to the project.

Department: Medicine/Cardiology

Other Comments:
All basic research materials and technology for the project can funded by the mentor's grants.
**Faculty Mentor:** Sandra Musial, MD  
**E-mail:** drmusial@aol.com

**Description of Project:**
Help to create (2-3 weeks) an educational summer program for families of children who are >85th% BMI including nutrition education, some simple meal prep, and an exercise component that would run every Thursday night for 7-8 weeks. A before and after survey of families and children will assess learned knowledge. Student will work with us in the HEALTH clinic (Healthy Eating Active Living Through Hasbro) assisting with education of the child and helping to create and compile educational materials. If time and interest, help with assessing data from an Infant Nutrition Study underway and possibly be involved in the write up for publication.

**SRA Research Subject Area:** Clinical Research, Medical Education/Patient Education

**Are there any necessary requirements for the student to apply? If so, please state:**
Interest in nutritional sciences, healthy eating, obesity medicine, pediatrics and teaching. Spanish speaker not mandatory but a plus. Skills: creativity, simple cooking knowledge, organization.

**What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?**
Meet with student once a week to mentor at Hasbro Children's Hospital. MD will attend weekly classes with student. MD will work side by side student in HEALTH clinic. Research work would be done independently.

**Department:** Pediatrics, Hasbro Children's Hospital

**Other Comments:**
We are flexible with above plan and open to other suggestions. Possible collaboration with Johnson Wales student for weekly classes.
Faculty Mentor: Phyllis Dennery, MD

E-mail: phyllis_dennery@brown.edu

Description of Project:

My laboratory investigates how the neonatal lung responds to injury by specifically looking at metabolic changes and the onset of premature aging in the lung. We use cell culture and animal models (neonatal mice) for this work. We are also collecting human saliva and blood samples for this work and have access to slides from human lungs.

SRA Research Subject Area: Basic Science Research, Clinical Research

Are there any necessary requirements for the student to apply? If so, please state:

diligent, willing to work hard. basic understanding of biochemistry and some lab experience but this depends on the student.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I will meet weekly and the senior lab personal meets daily with all students. Meetings occur in the laboratory. the student will be given reading materials and will be encouraged to go beyond this. Weekly lab meetings will help with the basic understanding. At the end of the summer, the student will present their work. if there is sufficient contribution to a project, the student may get a chance to submit an abstract to a national meeting.

Department: Pediatrics

Other Comments:

-There is limited additional funding for students in my endowed chair and a grant.

-Our laboratory is a fun environment with very supportive people.
Faculty Mentor: Qing Lu, PhD, DVM

E-mail: Qing_Lu@brown.edu

Description of Project:
Acute respiratory distress syndrome (ARDS) causes approximately 75,000 deaths among 190,000 cases each year in US. Pneumonia is the most prevalent cause of ARDS, accounting for 35-50% of ARDS cases. Cigarette smoke (CS) predisposes individuals to lung infections and increases incidence of ARDS and mortality in critically ill patients. The mechanism(s) of CS priming of pneumonia-triggered lung injury and ARDS is unknown and is critical for developing novel strategies for prevention and treatment of ARDS induced by pneumonia. We use cultured lung cells, mouse models and human samples and state-of-art technologies to address the mechanisms by focusing on CS effects on mitochondria and inflammation in alveolar macrophages and lung endothelial cells.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:
Previous lab experience is not required but very helpful. High motivation in science.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?
Attending weekly lab meetings and weekly seminars. I am available on daily base in my office or lab.

Department: Medicine

Other Comments:
He/she will be able to write a draft of SRA proposal a few weeks before deadline, so we will have enough time to revise it.
Faculty Mentor: Michael Reznik, MD

E-mail: michael_reznik@brown.edu

Description of Project:

I am the PI for several ongoing clinical research projects nested within a prospective registry capturing all patients admitted to Rhode Island Hospital with intracerebral hemorrhage (ICH). While the focus of my research projects is primarily related to delirium and its components (including arousal, attention, and motor activity) in patients with ICH and other types of stroke, the flexibility and granularity of the database allows for a multitude of potential unrelated retrospective studies in this patient cohort, including some that have already been built into data collection elements. Becoming involved in these projects would likely require significant supplementary chart review, but could allow a student to participate in the design of a unique study, as well as in its subsequent analysis and manuscript preparation/revision.

SRA Research Subject Area: Clinical Research, Chart Review

Are there any necessary requirements for the student to apply? If so, please state:

Experience with data abstraction using RedCap, preferably from electronic medical records, is definitely a plus, though not required--additional training can be provided as necessary. Any other experience with relevant software (for example, statistical p

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Depending on the student's goals, I will be able to provide weekly mentorship sessions during the period of their summer assistantship, so that they have guidance in pursuing an independent research project. Afterwards, if they continue to show interest in pursuing research as a long-term goal, I am willing to continue these mentorship sessions on anywhere from a monthly to quarterly basis depending on their (and my) availability.

Department: Neurology
Faculty Mentor: Thomas Roberts, PhD

E-mail: thomas_roberts@brown.edu

Description of Project:

Our lab recently showed that treatment of skeletal muscle with a hypertonic (dilute) solution increases its passive force output. The project will involve using isolated muscles to determine if this result is physiologically relevant, i.e., if a small amount of fluid change in a muscle can make it stiffer.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

Some research experience is desirable, but not essential. Good quantitative and analytical skills. Enthusiasm for research and native curiosity.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I meet with students several a week during the summer.

Department: Ecology and Evolutionary Biology
Faculty Mentor: Shaw, Sunil

E-mail: sshaw@wihri.org

Description of Project:

The lab studies bloodstream infections with Candida parapsilosis using microbiology, immunology and cell biology techniques. Current student projects include live cell microscopy of leukocyte chemotaxis and phagocytosis, and molecular biology of yeast pathogenesis.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

Basic biomed lab skills (pipeting, measuring), arithmetical competency, good hand-eye coordination, undergraduate level courses in molecular and cellular biology.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I typically meet with students at least daily. I am in the lab most days for 2-4 hours.

Department: Pediatrics
Faculty Mentor: Barbara Stonestreet, MD

E-mail: bstonetreet@wihri.org

Description of Project:
Perinatal brain injury resulting in mental retardation (MR) and cerebral palsy (CP) is the most severe disability in childhood. The incidence of CP is 40-148 in preterm and 1-2/1,000 in full term infants. Developmental disabilities place a huge burden on society (lifetime costs per person: ~1 million dollars), emphasizing the urgent need for improved treatment strategies to reduce perinatal brain damage. Unfortunately, hypothermia, the only approved therapy for brain damage in infants is only partially protective, can only be used to treat hypoxic-ischemic (HI) encephalopathy in full term infants, and cannot be used for preterm infants in whom supportive care is the only ‘therapy’ to attenuate brain damage. Cytokines represent a final common pathway, which cause/augment fetal/neonatal brain damage. Inter-alpha inhibitor proteins (IAIPs) down-regulate pro-inflammatory cytokines in sepsis and inhibit destructive serine proteases. Little information is available about IAIPs in brain. Recent data suggests that bikunin, a fragment of IAIPs, isolated from urine, attenuates stroke-related brain injury and experimental autoimmune encephalomyelitis-related white matter loss in adult rats. However, the half-life of bikunin is very short (3-10 min), compared with the complexed form isolated from blood (8-12 h in adult rats), requiring large quantities of protein and continuous intravenous infusions. The potential neuroprotective effects of IAIPs isolated from blood have not been examined. We will examine the neuroprotective effects of the long-lasting blood-derived IAIPs. We anticipate that this form is a more effective feasible neuroprotective for clinical use. Our preliminary studies with blood-derived IAIPs suggest that this agent is remarkably neuroprotective in HI neonatal rats, fetal sheep after ischemic injury, and in adult rats after stroke. Our overall goal is to develop a novel effective therapy to treat ischemic brain damage using the preclinical fetal sheep model in which IAIPs can be given by the clinically relevant intravenous route. We hypothesize that systemic IAIP administration attenuates the development of ischemic-reperfusion related injury in the immature brain. The purpose of this preclinical developmental proposal in translational research is to provide a strong biological basis to support the use of IAIPs as therapeutic agents to treat ischemia-related brain injury in the immature brain. The aims are: (1) To determine the pharmacokinetics of intravenously administered IAIPs in the ovine fetus; (2) To establish the dose of IAIPs with the greatest neuroprotective efficacy in the fetus; (3) To examine the neuroprotective efficacy of delayed treatment with IAIPs on brain injury. Fetuses will be surgically prepared; brain ischemia induced by carotid occlusion and injury measured by a multidisciplinary approach including EEG, physiological, biochemical, pathological, immunological, immunohistochemical, and molecular methods. The results of the studies could yield novel preclinical information that will accelerate
the use of IAIPs as neuroprotective agents to treat ischemia-related brain injury in the fetus/neonate and, potentially prevent MR and CP in infants.

**SRA Research Subject Area:** Basic Science Research, Clinical Research

**Are there any necessary requirements for the student to apply? If so, please state:**

Biology or neuroscience

**What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?**

**Department:** Pediatrics

Barbara Stonestreet, MD
Faculty Mentor: Laura Stroud, PhD

E-mail: lstroudri@gmail.com

Description of Project:
Interest in maternal marijuana and depression in pregnancy and offspring novel biomarkers

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Weekly check-in meetings, and staff will be available during the week for oversight and questions, our office is located at 1 Hoppin Street in Coro West.

Department: Centers for Behavioral and Preventive Medicine at the Miriam Hospital
Faculty Mentor: Hongwei Yao, MD, PhD

E-mail: hongwei_yao@brown.edu

Description of Project:

Bronchopulmonary dysplasia (BPD) is a chronic lung disease which affects 10,000 to 15,000 premature babies annually in the USA. Our lab focuses on the understanding the molecular mechanisms underlying the pathogenesis of BPD and its cardiovascular sequelae. Specifically, we are interested in the metabolic regulation of lung endothelial cell dysfunction during hyperoxic lung injury using in vitro cells and in vivo mouse model. This project was supported by the NIH CPVB/COBRE funding.

SRA Research Subject Area: Basic Science Research

Are there any necessary requirements for the student to apply? If so, please state:

Proactive nature with motivation and critical thinking.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

I will meet the student everyday in lab based on weekly experimental plan.

Department: Molecular Biology, Cell Biology & Biochemistry
Faculty Mentor: Hamish Fraser, MBChB

E-mail: hamish_fraser@brown.edu

Description of Project:

This project is an evaluation of the diagnostic accuracy of smartphone based patient diagnosis aids or symptom checkers with real patient data. There is a proliferation of such smartphone Apps many of which have been released for unsupervised patient use which could cause risk to patients with serious conditions. The study will involve entering pre-collected clinical data in to one or more symptom checker Apps and analyzing their diagnostic accuracy and safety.

SRA Research Subject Area: Clinical Research

Are there any necessary requirements for the student to apply? If so, please state:

No prerequisites; computational skills (e.g., databases and programming) a plus, but not required. Interest in patient safety and quality of care are important.

What is your plan for mentoring a student researcher (i.e., how often you will meet with the student, when, where)?

Schedule weekly in-person meetings at mentor’s office (also available by email any time)

• Provide working space to facilitate more frequent interactions (e.g., daily)

• Provide background readings and teach requisite evaluation, clinical data coding and analytic skills  [Weeks 1-2]

• Provide guidance for analyzing data and results for project [Weeks 3-8]

• Work with student to write a 1-page abstract that summarizes the project and potentially prepare an oral/poster presentation for a local event (e.g., Scialogue or Summer Research Symposium) [Weeks 9-10]. Aim to publish results.

Department: Brown Center for Biomedical Informatics