

**SUMMER RESEARCH ASSISTANTSHIP IN EMERGENCY MEDICINE
(SRA-EM)**

LIST OF PROJECTS — FOR SUMMER 2019

The following research projects have been developed by Brown Emergency Medicine faculty members. All work will be conducted on the Rhode Island Hospital / Hasbro Children's Hospital campus in Providence, RI; either in the adult or pediatric emergency departments, centers, or labs affiliated with the Brown Department of Emergency Medicine. Specific information regarding each project is detailed on the following pages.

Before selecting a project, please review the "SRA-EM Program Overview and Instructions" (located on the SRA-EM webpage). If you are ready to commit to this program and are interested in one of the projects listed below, please contact the faculty mentor as soon as possible. The faculty mentor must agree to sponsor you before you complete the SRA-EM application (due February 13, 2019).

Project Title	Faculty Mentor	Page #
<i>Identifying Factors Associated with Top Performance in Combined Baccalaureate-MD Programs</i>	Dr. Rory Merritt	Page 2
<i>Machine Learning & Pediatric Sepsis</i>	Dr. Laura Mercurio	Page 3
<i>Language Disparities for Spanish Speaking Families in the Pediatric Emergency Department: Healthcare Staff's perception of Barriers</i>	Dr. Susan Duffy	Page 4
<i>Violence Prevention Among High-Risk Youth: A Digital Health Study</i>	Dr. Megan Ranney	Page 5
<i>Assessing the Impact of Bystander Naloxone on EMS Patients with Opiate Overdose</i>	Dr. Nicholas Asselin	Page 6
<i>Human Metapneumovirus and RSV in the Emergency Department: The Role of Upper Respiratory Infections in Admission to the ICU</i>	Dr. William Binder	Page 7
<i>Friction Associated Catabolism of Articular Cartilage in the Absence PRG4</i>	Dr. Gregory Jay	Page 8

Faculty Mentor

Rory Merritt, MD

Medical Education Research Fellow, Department of Emergency Medicine

Rory_Merritt@Brown.edu

Co-Faculty Mentor

Christopher Merritt, MD

Assistant Professor of Emergency Medicine

Project Title

Identifying Factors Associated with Top Performance in Combined Baccalaureate-MD Programs

Project Description

Over eighty combined baccalaureate-MD programs exist in the United States yet little is described in the literature about their students nor what separates out top student performers in these programs. We will use an ideation survey distributed to the largest organization of combined BA-MD programs followed by a modified Delphi process to identify: 1) factors important to top performance; 2) factors that predict top performance in the undergraduate and medical school portions of training; and 3) ways to measure it. An excellent example of research using an ideation survey followed by modified Delphi process is "Factors Important to Top Clinical Performance in Emergency Medicine Residency: Results of an Ideation Survey and Delphi Panel" by Pines et al. AEM Educational and Training, 2018. DOI: 10.1002/aet2.10114

Requirements/Restrictions

No previous experience required

Mentoring Plan

My plan would be to meet at least weekly with the student to assess progress, provide mentorship and provide feedback. At the beginning of the summer, we will establish student goals as well as have a professional discussion regarding potential authorship of papers (modeling this is so important). At the midpoint and end of the summer, I will request feedback from the student regarding how I can better meet their needs.

Research Location

Emergency Medicine Administrative Office

55 Claverick St

Providence, RI 02903

Faculty Mentor

Laura Mercurio, MD

Pediatric Emergency Medicine Fellow, Department of Emergency Medicine

lauraymercurio@gmail.com

Co-Faculty Mentor

Susan Duffy, MD, MPH

Professor of Emergency Medicine

Project Title

Machine Learning & Pediatric Sepsis

Project Description

Pediatric sepsis is a disease that confers significant morbidity and mortality. Patients with sepsis are often hard to identify among the large population of children presenting with fever. This project will entail pulling a large dataset from the Hasbro Children's Emergency Department, and then using predictive modeling (e.g. machine learning) to identify and refine patient attributes that are associated with the diagnosis of sepsis. The student will assist in data cleaning, identification of predictors, and building predictive models.

Requirements/Restrictions

Preferred qualifications include students with programming and machine learning experience

Mentoring Plan

We will plan at least one in-person meeting per week in a casual setting to discuss tasks for the week and associated learning objectives – e.g. articles on pediatric sepsis. These meetings will last 1-2 hours. Additional meetings will include - meeting with computer scientist (Dr. Eickoff) regarding predictive analytics approach, including identifying/refining our predictive variables.

Research Location

Hasbro Children's Hospital Emergency Department

593 Eddy Street

Providence, RI 02903

Emergency Medicine Administrative Office

55 Claverick St

Providence, RI 02903

Faculty Mentor

Susan Duffy, MD, MPH
Professor of Emergency Medicine
sduffy@lifespan.org

Project Title

Language Disparities for Spanish Speaking Families in the Pediatric Emergency Department: Healthcare Staff's Perception of Barriers

Project Description

This mixed methods study is designed to improve our knowledge about practices and barriers to communication with Limited English Proficient (LEP) patients. By conducting focus groups, individual interviews and surveys with various healthcare workers we hope to better understand the practices and perspectives in the process. The student will be trained to conduct individual structured interviews with ED staff. The student's schedule will be flexible and may need to be after hours based on staff availability.

Requirements/Restrictions

Medical student preferred. Experience with interviewing, interest in population health and/or disparities in care.

Mentoring Plan

Dr. Duffy, along with faculty in the Department of Psychiatry and behavioral sciences will train the student in qualitative interviewing skills and techniques. Dr. Duffy will model and supervise the student directly and will meet weekly to review interviews. In addition, the student will have the opportunity to shadow patient care in the Hasbro ED.

Research Location

Hasbro Children's Hospital Emergency Department
593 Eddy Street
Providence, RI 02903

Faculty Mentor

Megan Ranney, MD, MPH
Associate Professor of Emergency Medicine
megan_ranney@brown.edu

Project Title

Violence Prevention Among High-Risk Youth: A Digital Health Study

Project Description

The student will join my research team working on iDOVE2, a randomized clinical trial of a text-message intervention to prevent violence and related negative consequences among high-risk adolescents. The student will participate in all aspects of iDOVE2, including screening patients, enrolling patients, and engaging in follow-up at the Rhode Island Hospital ED, the Hasbro ED, or The Miriam ED. S/he will also have the opportunity to assist with big data approaches to assessing outcomes and to examining secondary outcomes including cyberbullying, depression, and substance use. S/he may also, as desired, have the opportunity to work on parallel digital health and violence-prevention research projects, including social media-based gun violence research – possibly including research design, literature reviews, data gathering, and analysis. The specific roles and responsibilities will depend partly on joint conversations between the student and myself, prior to submitting the SRA-EM application. I require 40 hours/week. You will be expected to work evenings and weekends on a rotating basis.

Requirements/Restrictions

Required qualifications include: 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 • Willingness to work weekend/evening hours as needed. Preferred qualifications include: • Coursework in public health and psychology • Interest and/or prior experience with mental health, high-risk adolescents, informatics, and/or digital health • Prior experience with qualitative methodology (strongly preferred) • Comfort discussing sensitive topics, including histories of violence and mental health • Familiarity with citation software (e.g., EndNote), Stata or similar statistical software, and/or NVivo.

Mentoring Plan

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. My team is located at the 55 Claverick St office, which is where many of our meetings will take place. 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.

Research Locations

Emergency Medicine Administrative Office
55 Claverick St, Providence, RI 02903

Rhode Island Hospital & Hasbro Children's Hospital Emergency Departments
593 Eddy Street, Providence, RI 02903

The Miriam Hospital Emergency Department
164 Summit Ave, Providence, RI 02906

Faculty Mentor

Nicholas Asselin, DO, MS
Assistant Professor of Emergency Medicine
nicholas_asselin@brown.edu

Project Title

Assessing the Impact of Bystander Naloxone on EMS Patients with Opiate Overdose

Project Description

The student will assist Dr. Asselin 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 documentation, project development, chart abstraction, data analysis, statistical planning and dissemination of findings via Abstract/Poster/Oral Presentation and publication as an author.

Requirements/Restrictions

EMS experience preferred, but not required

Mentoring Plan

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

Research Locations

Emergency Medicine Administrative Office
55 Claverick St, Providence, RI 02903

Rhode Island Hospital Emergency Department
593 Eddy Street, Providence, RI 02903

Faculty Mentor

William Binder, MD
Associate Professor of Emergency Medicine
william_binder@brown.edu

Co-Faculty Mentor

Selim Suner, MD, MS
Professor of Emergency Medicine

Project Title

Human Metapneumovirus and RSV in the Emergency Department: The Role of Upper Respiratory Infections in Admission to the ICU

Project Description

We will be doing a retrospective study (chart review) of patients admitted through the ED with a positive RVP (respiratory viral panel) and determine their disposition: Admitted, Died, or Discharged home. We will need to determine whether the patient has comorbidities (copd, cad, immune compromised) as well as the patient's age, gender, tobacco history, and other demographics.

Requirements/Restrictions

Experience with RedCap preferred, but not required

Mentoring Plan

I will meet with the student weekly, but certainly more at the early stages of this project.

Research Locations

Emergency Medicine Administrative Office
55 Claverick St, Providence, RI 02903

Rhode Island Hospital Emergency Department
593 Eddy Street, Providence, RI 02903

The Miriam Hospital Emergency Department
164 Summit Ave, Providence, RI 02906

Faculty Mentor

Gregory Jay, MD, PhD
Vice Chair for Research, Department of Emergency Medicine
gregory_jay_md@brown.edu

Project Title

Friction Associated Catabolism of Articular Cartilage in the Absence PRG4

Project Description

This research project will build on a number of key publications showing that PRG4 not only lubricates articular cartilage but also prevents catabolic processes to the chondrocytes directly underneath the articular surface. We plan to continue this research with the help of a highly motivated student to understand more about the release of peroxynitrite, activation of caspase 3 and how nitrosylation of a key CYS residue in the active cleft of caspase 3 arrests apoptosis. We hypothesize that autophagy is the natural outcome of this catabolic process. This project involves the use of transgenic mice with their PRG4 expression under the control of Cre. It is important for the student to have a working understanding of Matlab who is also motivated to learn dissection skills to remove soft tissue from harvested hind limbs such that the knee joint serves as the fulcrum of a pendulum. In this manner, whole joint coefficient of friction is measured. Subsequently articular cartilage is harvested from the same joint for biochemical assays.

Requirements/Restrictions

The students' academic qualifications and prior research experience should include: some familiarity with Matlab, dissection skills and attention to detail important in maintaining a laboratory notebook and performing biochemical assays.

Mentoring Plan

The student will be part of a small research team consisting of Dr. Gregory Jay (PI) and Ling Zhang (research assistant). This team will gather on an almost daily basis to ensure that mice are being bred appropriately, the correct genotypes are being studied and the data is acquired in a near GLP fashion. It is important for the student to maintain his or her own notebook which will accurately reflect the progress of this project which will ultimately result in publication.

Research Location

Dr. Jay's Laboratory
One Hoppin Street
Coro Building, West Wing, 4th Floor
Providence, RI 02903