



## **Introduction:**

Students on the Forefront of Science (SFS) is an initiative developed by the Science Department at Brooks School. The goal of the program is to provide rising sixth-formers (between junior and senior year) with innovative experiences that will expose them to research, technology, and advanced studies in the sciences. It is our strong belief that a hands-on research opportunity in a lab or field setting will best encourage students to continue in the field of science. Recipients, selected through a competitive application process, will participate in this summer undertaking provided by the SFS program. Students must be willing to commit to the programs for their entire length and recognize the serious obligations involved in such an undertaking. The opportunities for 2019 are impressive and there is little doubt that they will meet the same high expectation that have been set in the past. A total of eleven internships are currently being offered for next summer in the areas described below.

## **For the summer of 2019, internships will be made available in the following areas:**

- Perioperative Medicine Research and Clinical, Massachusetts General Hospital
- Operations Management Research, Massachusetts General Hospital
- Orthopedic Medicine Rotation, Tufts Medical Center (TMC)
- Biodiversity Conservation, Quebec Labrador Foundation, Newfoundland, Canada
- Psychiatric Neuroimaging Laboratory of Brigham and Women's Hospital
- Engineering Technology Camp, Cupertino California

Research descriptions for the internships are found below. These descriptions are taken from the hospital or organization websites. If you have more specific questions you can contact Dr. Carabatsos: [mcarabatsos@brooksschool.org](mailto:mcarabatsos@brooksschool.org).

### **Perioperative Medicine Research and Clinical, Massachusetts General Hospital**

**Dr. Joseph Cotton:** Dr. Cotton's research focus is TASK tandem pore potassium channels. He is interested in the role of TASK channels in volatile anesthetic mechanisms and regulation of breathing and blood pressure by the carotid bodies. TASK potassium channel function is activated by volatile anesthetics and may contribute to volatile anesthetic-induced loss of consciousness and immobility. He has optimized an Ussing chamber electrophysiology rig for study of TASK function and, combined with site-directed mutagenesis and other molecular biology techniques, is studying the details of their regulation by volatiles. He is undertaking studies to determine the role of TASK channels in carotid body inhibition by volatile anesthetics and is developing pharmacologic strategies to reverse this inhibition.

**Dr. Ken Solt:** Dr. Solt's work has focused on investigating the mechanisms of emergence from general anesthesia using a systems neuroscience approach. Evidence suggests that arousal pathways in the brain play important roles in promoting emergence from general anesthesia. My team currently studies these pathways and developing novel methods to actively induce emergence from general anesthesia in surgical patients.

**Dr. William Curry:** Dr. Curry's work focuses on the way in which cancer cells interact with the human immune system. This field, known as Cancer Immunology, ideally uses knowledge of such interactions to develop immunotherapy for the treatment of cancer in patients.

## **Operations Management Research, Massachusetts General Hospital**

This internship will partner a Brooks student with a team of researchers from Massachusetts General Hospital and MIT who look at operations in the hospital setting. This internship will be a data analysis and research opportunity but the student selected may also visit the operating room while working for the summer. This is a new experience.

## **Orthopedic Medicine Rotation, Tufts Medical Center (TMC)**

*Dr. Charles Cassidy:* Dr. Charles Cassidy graduated from Northwestern University Medical School in Chicago, Illinois, and then completed his Orthopaedic Surgery Residency training at Tufts Medical Center. He graduated from the Tufts Hand Fellowship program and was a visiting clinician at the Mayo Clinic in Rochester, Minnesota. Dr. Cassidy is the Henry H. Banks Associate Professor and Chairman, Tufts University School of Medicine, and Orthopaedist in Chief at Tufts Medical Center. He is board certified in Orthopaedic Surgery and specializes in hand, elbow and upper extremity surgery, upper and lower extremity trauma reconstruction, and management of acute skeletal trauma.

## **Biodiversity Conservation, Quebec Labrador Foundation, Newfoundland, Canada**

*Quebec Labrador Foundation:* QLF is a Not-for-Profit Organization in the U.S. and a Registered Charity in Canada. QLF fosters long-term leadership development within individuals and communities by supporting community-based conservation initiatives; developing models of stewardship of natural and cultural resources; and aiding in community service, economic development, and heritage preservation in rural regions. Since the early 1960s, QLF has worked across borders to serve the communities of the Atlantic Region by working in partnership with communities and organizations from Long Island Sound to Labrador. This will include a 4-6 week stay in Montreal, Canada working in the QLF Canadian office. This internship will include writing articles and interviewing QLF alumni for both print and web-based publications.

## **Psychiatric Neuroimaging Laboratory of Brigham and Women's Hospital**

*Dr. Martha Shenton:* Dr. Martha Shenton is the director of the Psychiatric Neuroimaging laboratory. Students will be assigned to a researcher and participate in research to understand brain abnormalities and their role in psychiatric disorders using state-of-the-art neuroimaging techniques.

## **Engineering Technology Camp, Cupertino California**

**ETC Experience:** Students spend four weeks exploring different aspects of hardware design and engineering. The projects culminated in a final presentation to their mentor engineers.

### **Important Dates:**

November 12, 2018	Junior information Night
January 21, 2019	Application period closes
January 7-21, 2019	Interview Period
January 28, 2019	Decisions made, round 2 Apple Applications (tentative)
June 23, 2019	Internships start (tentative)
August 8, 2019	Internships end (tentative)