THE BIGELOW BOOK PRIZE

This award was established in 1995 by the Cardiovascular Sciences Collaborative Specialization to recognize and honor a pioneer clinician and scientist in the field of cardiovascular sciences. The award will be given in every year that a qualified student is identified and will consist of a book written by Dr. W.G. Bigelow entitled “Mysterious Heparin” and a plaque. Special account will be taken of sustained academic scientific excellence, innovative experimental approaches, original discoveries, and good scientific productivity. Some weight will be given to work that has recognizable clinical relevance, especially that which promises to improve patient care. As much as possible, awardees should exemplify the personal traits of Dr. Bigelow, including drive, curiosity, and scientific integrity.

2020 Bigelow Book Prize Recipient

Roberto V.P. Ribeiro, PhD Candidate
Institute of Medical Science
Faculty of Medicine
Supervisor: Dr. Vivek Rao

Ex Situ Heart Perfusion for the Transplantation of Hearts Donated After Circulatory Death

Heart failure is the primary cause of death in over 300,000 per year in North America. While many treatments exist to alleviate symptoms or decrease mortality, transplantation remains the best option in many of these patients. Medical advances have led to an increase in the number of patients qualified for heart transplant. A lack of donor hearts, currently only donated after brain death (beating-heart donor), created a mismatch between patients in need and treatment availability, with significant mortality while on the waitlist. Increasing usable donor hearts is the only way to overcome this problem. One option to expand donor pool is the usage of hearts donated after circulatory death (DCD or non-beating heart donor). The major challenge is the lack of a proper assessment tool to determine if these hearts can be used. It is not possible to adequately evaluate the organ in donors who have undergone circulatory death. Thus, many discarded hearts may be usable for transplantation. To address this, Ex Vivo Heart Perfusion (EVHP) systems, capable of reanimating and maintaining heart viability outside of the body, are being developed. These permit continuous functional assessment through contractility and viability measurements. However, optimal system settings and perfusion solution composition to meet the heart’s energy requirements and facilitate recovery during EVHP are unclear. Also, a validated assessment method to determine heart suitability for transplant has not been determined, precluding wide clinical incorporation. We have designed a ground-breaking translational project comprising both basic science and pre-clinical (animal model) experiments in the field of regenerative medicine. We shall compare novel perfusion solutions and assessment strategies for EVHP, and assess their effect on DCD heart transplantation. This project has potential to significantly increase the number of available hearts for transplantation for patients suffering from heart failure.