



Award Details

NSERC CREATE in Manufacturing, Materials and Mimetics (M3)

Research Details

Competition Year:	2013	Fiscal Year:	2018-2019
Project Lead Name:	Shoichet, Molly	Institution:	University of Toronto
Department:	Chemical Engineering and Applied Chemistry	Province:	Ontario
Award Amount:	300,000	Installment:	6 - 6
Program:	Collaborative Research and Training Experience	Selection Committee:	CREATE Program
Research Subject:	Biomedical engineering	Area of Application:	Manufacturing processes and products
Co-Researchers:	Audet, Julie J Bhatia, Mickie M Mahadevan, Radhakrishnan R McGuigan, Alison P Radisic, Milica M Rossant, Janet J Sefton, Michael MV van der Kooy, Derek DJ Yousaf, Muhammad MNY Zandstra, Peter W	Partners:	No Partners

Award Summary

The NSERC CREATE industrial stream training program in Manufacturing, Materials and Mimetics (M3) will provide graduate students with the breadth and depth of expertise required for success in industry. Specifically, M3 will provide a streamlined training environment for the advancement of knowledge and its translation through core courses, advanced research and industry experience. A total of 97 full-time equivalent students will be trained through M3.** A rich training environment in manufacturing, materials and mimetics will better prepare students for careers in industry. Our students will benefit from the complementary research expertise of our PIs from the University of Toronto, McMaster, and York, building on a strong and vibrant foundation of research excellence, collaboration and commercialization. There are 3 pillars in the M3 training program:**1. Soft Skills: Every student will take core courses in M3, leadership, and communications, thereby attaining both hard and soft skills required for success. Students will gain breadth of corporate knowledge through courses from the Institute for Leadership Education in Engineering (ILead), MaRS' Entrepreneurship 101, MITACs workshops and one-on-one counselling through the Graduate Experience Internship program. **2. Hard Skills: All students will participate in advanced research in the laboratories of our PIs, whose expertise encompasses cell manufacturing, biomaterials and tissue mimetics. In order to have a vibrant career in natural sciences and engineering, our trainees must gain a deep understanding of their field as demonstrated with peer-reviewed publications and international presentations. We will encourage our trainees to publish, present and patent innovative ideas, thereby resulting in tangible assets for knowledge creation and translation. **3. Experiential Learning Skills: All students will be required to spend one 4-6 month internships in industry where they will have the opportunity to work on product development, intellectual property or regulatory affairs. We will take advantage of Centre for the Commercialization of Regenerative Medicine (CCRM), its extensive industry consortium and the 14 start-up companies spun out of the Institute of Biomaterials and Biomedical Engineering, University of Toronto. The internships will provide students with a "real-world" experience and industry members with access to highly qualified personnel (HQP) and an extended period in which to interview them. ** The M3 training program is unique in Canada and indeed the world. The training requires a multi-disciplinary

approach, new methods for knowledge transfer, coupled with leadership and communications courses that will yield the future leaders and innovators in M3. In the knowledge-based economy of the 21st century, M3 represents a \$80-100 billion industry. Unlike traditional manufacturing, cell manufacturing, biomaterials and tissue mimetics require highly skilled and innovative personnel. Through this unique training program, students will be better equipped for success in industry by: working on core research projects relevant to industry needs; attaining core competency skills in leadership and communication; and gaining real-world experience. This will provide students with the skills and experience they need to succeed and our industry colleagues with bright, savvy graduates.** With industry internships, active research collaborations, and soft skills courses already available, M3 is destined for success. ****