Combining the Love of Art, Science, Business and Medicine to Innovate and Enhance Patient Health. Highlights from the 7th Annual Leaders in Medicine Symposium of the Cummings School of Medicine, Calgary, AB

Abstract
The Leader in Medicine (LIM) Program of the Cumming School of Medicine, University of Calgary, hosted its 7th Annual LIM Research Symposium on October 30, 2015 and participation grew once again, with a total of six oral and 99 posters presentations! Over 45 of our Faculty members also participated in the symposium. This year’s LIM Symposium theme was “Innovations in Medicine” and the invited guest speaker was our own Dr. Breanne Everett (MD/MBA). She completed her residency in plastic surgery at University of Calgary and holds both a medical degree and an MBA from the University of Calgary. In her inspiring talk, entitled “Marrying Business and Medicine: Toe-ing a Fine Line”, she described how she dealt with a clinical problem (diabetic foot ulcers), came up with an innovation that optimized patient care, started her own company and delivered her product to market to enhance the health of the community. She clearly illustrated how to complete the full circle, from identifying a clinical problem to developing and providing a solution that both enhances clinical care and patient health as well as reduces health care costs and hospital admissions. The research symposium was an outstanding success and the abstracts are included in companion article in CIM.

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The Leaders in Medicine (LIM) Program at the University of Calgary hosted its 7th Annual Research Symposium on October 30, 2015, showcasing the quality and breadth of work from students at the Cumming School of Medicine. Participation at the symposium was the largest to date, with a total of six oral and 99 poster presentations! For a detailed description of the work presented at the symposium, please see the Proceedings from the 7th Annual University of Calgary Leaders in Medicine Research Symposium published in this issue of Clinical and Investigative Medicine. The LIM program trains MD/PhD, MD/MSc and MD/MBA students to strive to use all their passions and knowledge to enhance health. The LIM Program has grown rapidly over the last 15 years, and for the 2015–2016 academic year there were 182 active students in the LIM program (Figure 1). The main growth in LIM has been the addition the LIM Affiliate Program where students, who may or may not have graduate degrees, participate in all of the LIM activities to enhance or develop their research and/or business/innovation skills, in combination with their medical education. The goal of the LIM program is to best provide our students with the tools required to enhance healthcare in the future. We believe that the dual degree approach is critical in this process but also recognize that the assets that each student brings to medical school are important. In 2015, over 54% of those applying to medical school in Canada had completed an undergraduate degree and 10% had completed a graduate degree (MSc, MA or PhD) [1]. Most medical schools treat a new student with two years of undergraduate courses the same as a student with a PhD in biostatistics or anatomy or an advanced degree in biomechanical engineering, computer science or psychology. We believe this sadly ignores the education and expertise in the medical school student body. The LIM Program actively works to capture these unique educational and experience skill sets and foster them through the students’ medical education so our students can best meet the diverse future of medicine and healthcare.

Many hypothesize that medicine lacks front line physicians or other care providers who can recognize a problem, develop tools and deliver results to the patient. Although the National Institutes of Health and other

**FIGURE 1.** Annual enrollment (active students) in the Leaders in Medicine Program. The LIM Affiliate Program was started in 2010 at the request of the medical school student body, and has rapidly become extremely popular. The “active” students may either be in the graduate school portion of their joint degree or actively involved in medical school curriculum. The total number of medical students in all three years of the medical school program was 486; thus, 37.4% of the medical school student body is involved in the LIM program (14.2% in Joint Degree Program and 23.2% in the Affiliate Program). Of the 69 students in the Joint Degree Program, there are 43 PhD, 21 MSc, three MBA and two MA students.
organizations have increased research investment, there has been a decline in new products and drugs delivered to the public. In short, there has been a failure to innovate with a reduced ability to take bedside ideas to the bench and deliver new therapies to the bedside. Although research and development spending has increased markedly, the number of new drugs approved per billion dollars spent has decreased by roughly 50% every nine years since 1950 [2]. This chasm between clinical problems and new therapeutic approaches has been termed “The Valley of Death” [3]. To address this, many leading medical and business schools have developed programs targeted at directly enhancing innovation [4]. The LIM program has developed a unique program that addresses a wide range of business issues, including patent protection and starting a new company, and all our monthly Translational Journal Clubs address assess and discuss innovation product development. In keeping with this, the theme of current LIM symposium was “Innovation in Medicine”.

The LIM Program was honored to host Dr. Breanne Everett as the keynote speaker for the 7th Annual Leaders in Medicine Research Symposium. Dr. Everett completed her medical degree at the University of Calgary, before taking a leave of absence from her residency program to complete her Master’s in Business Administration degree at the Haskayne School of Business (University of Calgary). Dr. Everett’s transition to the business world was prompted by her clinical experience working with diabetic patients during her residency in Plastic and Reconstructive Surgery. Dr. Everett was exposed to a condition called peripheral neuropathy (or “numb foot”), which burdens over 60% of diabetic patients [5]. In the United States and Canada alone, over 21.6 million people suffer from this condition. Dr. Everett noticed that her patients with peripheral neuropathy would often develop ulcers on their feet, due to their absence of pain feedback. These ulcers would often become infected, leading to limb amputations and, in some cases, death. During her residency, Dr. Everett also developed a strong interest in neuroplasticity, the brain’s ability to reorganize itself by forming new neural connections. This human phenomenon opened Everett’s eyes to the possibility of creating a medical device that could rewire sensory pathways between brain and foot. Combining her clinical experience, wealth of medical knowledge and penchant for innovation, Dr. Everett founded a medical technologies company called Orpyx in 2010.

Orpyx is dedicated to developing and distributing innovative technological devices that help to restore feeling in the numb feet of diabetic patients. Orpyx is groundbreaking because it provides a preventive solution for diabetic patients suffering from peripheral neuropathy, in lieu of long-established reactionary solutions. The company’s flagship product is called the SurroSence RX. The SurroSence RX is a pressure-sensing shoe insole that collects sensory pressure data from the foot and wirelessly relays this information to the display screen of a wristband device worn by the patient. This system alerts the user when pressure-induced damage is being done to their feet, and allows them to change foot position to prevent permanent damage. The newer product, the Orpyx Logr, is similar, but provides tactile information and only requires a smartphone for data viewing. Both products prevent...
significant negative ramifications of peripheral neuropathy, by allowing the user to feel sensations in their feet, using alternative pathways [6].

Since its inception in 2010, Orpyx has quickly become the global leader in sensor-based advanced wound care products. This success can be attributed to Dr. Everett making Orpyx her full-time occupation, after completing her MBA and medical residency. Since 2010, the company has grown from a team of two to a team of 12. At the same time, Dr. Everett and her colleagues raised over $600,000 in equity financing and $300,000 in non-dilutive funding. Orpyx continues to conduct major medical research studies, receiving funding and support from respected organizations such as Alberta Innovates Technology Futures, the National Research Council’s Industrial Research Assistance Program and Diabetes UK. This strong support network helped Orpyx win the ASTech Foundation’s 2013 Outstanding Science and Technology Start-Up Award. These Orpyx devices are currently for sale in Canada, the United States and Europe, and the company continues to conduct clinical trials and research to improve their products and develop new ones.

At a macro-level, Orpyx will continue to develop wearable technology that uses sensory substitution systems to improve the quality of life of users around the world. Orpyx is aims to expand the scope of their technological devices to reach a broader demographic of users, beyond diabetic patients. As quoted from Orpyx’s official website, “We see a vision for big data in health care that goes beyond capture and amalgamation, and into sophisticated data analytics that will enhance performance in athletes, vastly improve the quality of life in those suffering from degenerative diseases, and create better outcomes for broad populations through sophisticated high tech care” [6].

Dr. Everett has received numerous accolades and awards for her innovative work at Orpyx. She was named the Graduate of the Last Decade by the University of Calgary Arch Awards and was named one of Calgary’s Top 40 under 40 by Avenue Magazine. She also received the ASTech Leaders of Tomorrow Award, and was recently recognized at a national level, winning the 2016 Governor General’s Innovation Award.

When reflecting on her success in business and medicine, Dr. Everett claimed that even from a very young age, she always strove to combine her love for both science and art. At the age of 10 years, Everett started selling her own handmade jewelry and was featured on the CBC television show “North of 60”. As a young adult, Dr. Everett continued to pursue both of her passions by choosing to do her residency in plastic surgery, which gave her a platform to be creative. “I’ve always towed the line between science and art and it was one specialty where you could marry those two seemingly disparate areas”, Everett explained in an interview with the ASTech Foundation. Dr. Everett also credits her MBA with providing her the business knowledge to be a confident, full-time entrepreneur.

When it comes to innovation in medicine, Everett says that “medicine has been relatively resistant to a technological revolution” because “the traditional paths to research in medicine are quite well-entrenched” (5). Through Orpyx and her independent work in medical research, Dr. Everett hopes to create a culture in medicine that does more to foster innovation and creative-thinking.

Dr. Everett’s keynote address was entitled “Marrying Business and Medicine: Toe-ing a Fine Line”. Not only did she share her experiences in research, medicine and business training she gave a first-hand description how she took a problem she saw as a medical trainee, developed a solution and started her own business to help improve the health of the community. Her address at the LIM Symposium was attended by over 120 students and over 45 staff members. Many students commented on the incredible role model Dr. Everett was and that she inspired many to dedicate themselves to innovation in medicine! The research symposium was an outstanding success and likely represents the largest such research day for a medical school in Canada.

References