

# Interview: Raphael Hofstein, President & CEO, MaRS Innovation, Canada

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27.08.2013

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*The CEO of MaRS Innovation, a commercialization incubator created by 16 of Toronto's best research institutions and supported by the government, assesses Toronto's merits as an innovation hub, and describes several successful case studies of the way in which MaRS Innovation has helped to commercialize ideas in the pharmaceutical and healthcare sectors.*

## **Montreal is a big hub for innovation; what does Toronto have to offer?**

Toronto's research pedigree is extraordinary, starting with its abundance of curiosity-driven academic research. If you look at total research funding across the country, the total figure coming from the federal and provincial government for research is roughly \$5 billion, of which 25 percent comes to Ontario. In turn, a large portion of this money goes to institutions like the University of Toronto, which runs a substantial life sciences research program. That depth and breadth of activity means that many ideas are being entertained here, many of which are at a very early stage but some of which are moving towards translational research.

Academically, Canada is on par with world leaders like Stanford, MIT and others based on international ranking reports, number of publications, number of citations, and quality of citations. All these metrics add up to a legitimate statement that, from a research perspective, Canada is in good shape.

There is, however, a notable gap between this research excellence and the Canadian lag behind the world leaders in commercialization. Everyone is concerned about it. The federal government wishes to close this gap rapidly, and to do that they came up with a program called Centers of Excellence in Commercialization and Research (CECR), which is run through the Networks of Centres of Excellence (NCE).

When that program was announced, 16 of Toronto's research institutions decided to be bullish and combine their commercialization efforts into a centralized agent to whom they would each pay membership fees.

MaRS Innovation (MI), created through this collective will, received a \$15 million grant from the federal government when it was founded in 2007, matched by member fees, giving rise to an office whose sole charter is to improve on commercialization with a minimum of \$30 million for five years. Our 16 members in downtown Toronto generate significant intellectual property for the MI pipeline, which stands to transform Toronto's performance as a research commercialization hub within the larger Canadian scene.

When MI was created, I came to Toronto from Israel after 20 years of working in commercialization to become its inaugural president and CEO. Our modus operandi is divided between two goals: ensuring that every idea that comes to mind through research activities comes to our attention to build the foundation for deal flow, and creating deal flow through the 250 to 300 ideas generated and disclosed to us every year and choosing the most promising to bring to market.

### **How do you determine if a project is viable?**

MaRS Innovation is comprised of 25 full-time employees, but also works intensively with consultants or law firms focused on intellectual property (IP) to assess each and every disclosure. It's not a small task: our portfolio is multi-sectoral with 60 percent in medical sciences, 20 percent ICT, and 20 percent physical and chemical sciences. MI needs sufficient skillsets to make proper selections through triage: the 10 percent industry standard does really reflect the percentage that advances. After four years, we have a portfolio of 100 projects from the total 1,000 disclosures made during that period.

### **Could you highlight one of these projects?**

There are approximately 60 projects in life sciences, divided evenly between therapeutics, drug development, and diagnostics. Of those, in diagnostics, we started a company called Xagenic three years ago to combine molecular biology and nanotechnology to provide a detection method

instead of a polymerase chain reaction (PCR). While PCR is fairly accurate and reliable, hospital personnel wanting to do a whole array of testing using this method cannot get an answer in less than 24 hours, and situations such as bacterial detection just cannot afford that kind of delay. To that end, Xagenic is developing an alternative to PCR made of key elements of molecular biology and nanotechnology, and is creating a handheld device that every clinic can use.

MaRS Innovation was heavily engaged to translate Xagenic's academically-driven project into a market-ready product. Our commercialization model relies on a high-touch, embedded management model in which our team manage and monitor all activities. In this case, MI staff took invested in intellectual property (IP) protection and made a seed investment of \$500,000 to create Xagenic as a company and develop its technology while raising another \$1.5 million from a number of different agencies in Toronto. The resulting \$2 million led Xagenic to successfully miniaturize a diagnostic device, an extremely important milestone, and make it really handheld. Creating a legitimate, marketable and operational prototype took about a year and that \$2 million in funds, clearing the path to raising a Series A round.

In January 2012, Xagenic raised \$10 million to validate its technology through a partnership between CTI Life Sciences, another government-driven VC in Ontario, and a European company called Qiagen. In the device area, if you want to get a product approved, you have to show the regulator that you have tonnes of data as part of your validation. Xagenic successfully did all this and is likely getting ready for the next round. They have graduated from MaRS Innovation's management and have grown to over 30 employees: we only remain attached to each company until they get on their feet. Significantly for Canada and our federal funding partners, the support they received through MI means that rather than moving to the US, Xagenic has remained in Canada.

### **Could you describe your recent partnership with Pfizer?**

The first thing to note is that our industry partners in the life sciences include Pfizer, Merck, GSK, Baxter, and Johnson & Johnson. MaRS Innovation invites all of them to learn about the portfolio. In the early days of tech transfer, we used to protect the IP, put together a one-page summary and send it to big pharmaceutical companies to develop a product and earn royalties. This paradigm no longer works because they do not invest in the early stages. Instead, these companies rely on MaRS Innovation to do the R&D work for them at the pre-seed stage. MaRS Innovation cannot carry the burden alone, so we invited multinational pharma to create framework funds with us: they commit money into a fund and we work together to identify interesting opportunities from our portfolio. When we have suitable candidates, they volunteer some of the earmarked money, which

MaRS Innovation matches. After a period of time, if an idea develops properly, pharmaceutical companies can exercise an option to continue funding and developing, and then MaRS Innovation has to figure out how to fund the technology into a more advanced stage.

### **How can other cities or regions with this potential learn from MaRS Innovation?**

The model can be duplicated, but it must be done effectively. For example, the resulting organization must have access to money. Despite the fact that there are many technology transfer offices, many are challenged by lack of key attributes and mainly the three crucial components namely Merchandise (IP), Money and Management all of which are available as part of MaRS Innovation service tool kit.

For example, Baxter recently started a project with us called Vasomune. After 20 years of academic research, the team has synthesized a peptide that resembles naturally occurring peptides dealing with vascular reconstruction. It sounds trivial, but it is not easy to synthesize peptides, which tend to degrade. So how do you protect them from degrading while they need to be active. MaRS Innovation got involved. To address the chemistry, pharmacology, biology, and medical aspects, we created Vasomune Therapeutics, a company that we are currently managing. We went back to the framework fund with Baxter and, using our system for selection, created an investment committee similar to those of venture funds.

On the devices side, MaRS Innovation similarly engages the leading global industry players. One area of specialty is dedicated to improving medical imaging. On that front, we are engaged in similar discussions with GEHC, Philips and Elekta, to mention a few.

### **What is your internationalization strategy?**

All of these industry partnerships are based on relationships with both international and Canadian headquarters. This emphasis is important because decisions around R&D investments are made globally. MaRS Innovation also engages the Canadian offices because each of them has specific areas of interest and we want to engage everyone around the table.

### **What is your vision for MaRS Innovation for the next five years?**

I want to share the success stories. The CECR program's mission is to create organizations that eventually become economically self-sustaining. My team knows that we are expected to continue operations based on revenues, which MaRS Innovation will share with the member institutions we represent. While the 16 institutions will get the bigger allocation, we need to build sustainability from our piece. The next time we meet, I want to be able to tell you about a \$1 billion blockbuster

that MaRS Innovation has developed.

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