

Innovation Conversations: Q&A with Molly Shoichet

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In science, you could say that Molly Shoichet has done it all. She leads a large research group at the University of Toronto that combines engineering, chemistry and biology to address some of the biggest questions in medicine, such as how to restore vision and how to regenerate the brain after stroke. She is also a serial entrepreneur who has launched three companies. The latest, **AmacaThera**, is focused on commercializing a drug-delivery material developed in her lab that could dramatically reduce the use of prescription opioids by patients after an operation. And then there are the numerous leadership roles Shoichet has held, including her brief tenure as Ontario's first—and so far, only—**chief scientist**, advocating for evidence-based decision-making in government.

In an interview with RESEARCH MONEY, Shoichet discussed her new venture, as well as her views on innovation in Canada.

RESEARCH MONEY: *AmacaThera is a start-up focused on the long-lasting delivery of pain medication to patients who have undergone surgery. How did it come about?*

Molly Shoichet: In my lab, we first invented a new material about a decade ago. The material has some really cool engineering properties, but it turned out to have some really important biological properties, too: it is an anti-inflammatory, it promotes wound healing, and it promoted the survival of cells. We thought, well, let's see if there's an opportunity to advance this technology towards commercial IP.

The application AmacaThera is launching with is a product for postsurgical pain. We chose this application because there is a really big clinical need, a really large market pull, and also a great social benefit in terms of overcoming pain associated with having an operation. And given that we're living in this age of the opioid crisis, if we can get standard pain medications to work for a longer period of time, then we could obviate the need for patients that take opioids after surgery.

RS: *What stage is the company at?*

MS: The company really incubated in my lab at the University of Toronto, where we were able to do all of the preclinical studies. Now, we have to prepare to do the clinical trials and outsource the work we've been doing to a contract research organization and a GMP [good manufacturing practices] facility to bring things to scale.

In terms of funding, our funding round is still open, so we are still looking actively for investors. We were thrilled to get two venture capital groups to kick off this round, but they're both from the United States. It would be really great to have some Canadian investors on our team because our goal is to build a great company and build something that will meet patients' needs in Canada. But there's already the pull to go the U.S.

RS: *What major challenges have you faced with AmacaThera so far?*

MS: I think the big challenge we face in Canada, especially in biotech, is access to capital. Unlike apps or digital technologies, with biotech everything takes longer to bring to fruition. I would say the rewards are very high but the timeline to get there is longer.

So with AmacaThera, we've tried to do everything to de-risk it as much as possible, in terms of working with known drugs. Think of it like a recipe: All the ingredients are known, but you put them together in a unique way and you get something that just tastes great. That is what we're doing as well. Everything is known, but we're putting the parts together in a way that nobody has done before, and therefore we're getting results that no one's been able to get before.

RS: *Has the company benefitted from the support of government or other organizations?*

MS: We participated in the [Creative Destruction Lab](#), which is out of the Rotman School of Management. We learned a lot going through that program. We also participated in a program called [UTEST](#) [University of Toronto Early Stage Technology program], where we got our first \$50,000 in funding. Then we worked with [OBIO](#) [Ontario Bioscience Innovation Organization], which provided us with a bit more money and also access to advisors and an ecosystem. We also worked closely with [MaRS Innovation](#) on our patent strategy, plus we received an [NSERC Idea to Innovation](#) grant.

Through all these different organizations, we got some really good advice and mentorship and money, though not enough to do what we needed to do. So I do think we feel supported by the system.

RS: *What more could be done to help companies like yours succeed?*

MS: We talked about having access to capital and access to early capital. But in addition to that, there are organizations that have the capital to invest at the seed level, where we are, but I think they need a little bit more independence. One of the challenges we faced early on is we had a lot of people that said, "We'd like to invest but we can't be your lead investor." I don't

had a lot of people that said, “We’d like to invest but we can’t be your lead investor.” I don’t know if it is a Canadian phenomenon, but it’s almost like you need someone external to say, “Yeah, that’s a good idea.” But, I think, once a fund has done their due diligence, they should be able to lead rounds.

I also think our governments are a little concerned about this view of supporting business. They have gotten better, but there’s still a long way to go in terms of incentivizing companies to come here and set up shop. In Canada, we’ve got to think of ourselves as part of a global ecosystem and acknowledge the global challenges to attracting the best talent. So I think we need to up our game from a government perspective and not be afraid to support business, because ultimately what you’re doing is you’re supporting your own population, right?

R\$: *What about at the university? You’ve been at the University of Toronto for more than 20 years. Have you witnessed the culture shift toward entrepreneurship?*

MS: Certainly. Over the past 20 years, more and more of my colleagues are starting companies or collaborating with companies. We also see it in our students. A couple of decades ago, all the students getting PhDs wanted to have faculty positions. That’s not true anymore. At least half or more of my students will end up in industry, which I think is fantastic.

R\$: *Has being active in business changed the way you think about teaching and training the next generation of Canadian scientists?*

MS: Well, for the past six years, I’ve led an **NSERC Create** program, which is a graduate training program. Our goal has been to better prepare students for careers in industry, but I think what we do is prepare them for better careers wherever they go. We’ve been emphasizing, for lack of a better term, the soft skills—communication skills, negotiation, leadership. I think those soft skills are what actually helps them get jobs, and differentiates them from everybody else who’s got a Ph.D.

R\$: *Let’s talk about your role as Ontario’s first chief scientist. How did it change your perspective on how the province can lead in a knowledge economy?*

MS: As chief scientist, I realized more than ever how I could be that voice of science and really emphasize the importance of investing in fundamental research. Because I strongly believe that basic science is at the root of our innovation ecosystem. After all, in a knowledge economy, the jobs of the future are based on knowledge, right?

Also, I loved working with Allan O’Dette, who was also the first chief investment officer for the province. We were starting to work closely together to bridge research and business. For example, we went to BIO [Biotechnology Innovation Organization] conference together. In biotech, there are really just a handful of people doing Seed and Series A funding. We need to think about bringing in more capital but also more people—more venture capital firms, more competition.

R\$: *When the Ford government took office in Ontario, your job as chief scientist was terminated, and the position is still unfilled. How can science advice be retained through changes in government?*

MS: When I was the chief scientist, one of the things that we wanted to put together was an external advisory group of people from different communities—from research and from business—to provide strategic advice. Think of it as an advisory body, similar to what a company’s board of directors or scientific advisory board. I think things like that would be very useful to the government, just to help them think about what opportunities are coming up and how to think strategically about them. My impression is that people are very willing to serve, to make a difference on a bigger scale, and to help the country succeed.

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