

NANOVIEW - A BU SPINOUT'S STORY OF SUCCESS

Introduction

NanoView Biosciences, a venture-backed startup purchased in 2022 by a California-based life science company, was entirely a creation of BU.

The company's founders, David Freedman and George Daaboul, were both PhD students in BU's School of Engineering. Freedman and Daaboul met working at the lab of Professor Selim Ünlü and then incubated NanoView at "the BIC," the Business Innovation Center inside BU's Photonics Center, located at 8 St. Mary's Street in Boston. [Rana K Gupta, a Lecturer in BU's Questrom School of Management, met Freedman and Daaboul in 2012 and](#) mentored the founders for the next six years. An early investor in NanoView, Parker Cassidy, earned his Bachelor of Science in mechanical engineering at BU. When the time came for Freedman to hand over the CEO reins, the company hired an executive, Jerry Williamson, who had earned his MBA at BU. The people, product, and place of NanoView and its success were all strongly linked to BU.

A core element of NanoView's intellectual property was developed in a lab run by [Selim Ünlü](#), a professor in BU's Department of Electrical and Computer Engineering. "BU did a really fantastic job of encouraging and helping us build our company from the ground up," Freedman said. "It was really a great ecosystem for growing a company." The pair also credit [Michael Pratt](#), the university's managing director of Technology Development, for his guidance. A licensing deal needed to be negotiated with the university, and Pratt "made sure we weren't burdened by the deal," said Freedman.

Grown Inside a BU Lab

David Freedman had long known he wanted to be an entrepreneur. "My parents had a startup," he said. "I had always been passionate about startups." He arrived on campus in 2005 to start a PhD program in electrical engineering, on the lookout for an idea that might let him build a company.

George Daaboul also arrived at BU in 2005, as an undergraduate majoring in biomedical engineering. As an undergrad, he worked with Prof. Ünlü, who specializes in biophotonics, where biology meets light. That had Daaboul working on biosensors, biological imaging techniques, and digital detection based on a single particle or molecule. (Prof. Ünlü was honored as BU's 2021 [Innovator of the Year](#).)

"I thought I'd go to medical school," Daaboul said, "but, funny story, I didn't get in and so I was like, 'Alright, I might as well do my PhD then.'" Initially, Freedman also thought he would be leaving the campus in 2009. He had earned a PhD in electrical engineering, but the country was going through what economists have dubbed the Great Recession. "I thought it was

a bad time to look for a job,” Freedman says. Instead, he went to work as a post-doc in the lab of Prof. Ünlü, where Daaboul was also doing research.

Success stories often don’t start as we imagine. Some earlier false starts along the journey included the BU [Ignition Award program](#) to help professors and other researchers on campus reach a critical milestone in pursuit of a potentially commercial product under development. Daaboul earned an Ignition Award for a product that never found its market and there was also an earlier effort that involved seven graduate students on campus, including Daaboul and Freedman. The group entered several pitch competitions, but ultimately decided the idea was not commercially viable enough to pursue. “Most of the others, they went to California and got jobs,” Freedman said. “That left the two of us.” Daaboul was working on a [project with a second professor, John Connor](#), in BU’s School of Medicine, on a device that employed biophotonics to do rapid detection of Ebola and other hemorrhagic fever viruses. That was around the time of the outbreak of Ebola in West Africa. “The idea was something we could deploy in Africa, out in the field,” said Daaboul, who earned his PhD in biomedical engineering in 2013. Freedman joined the project to help them create the device they would use for detection.

“Dave was a perfect fit because he had the skill set to build a prototype while I was more on the high-level science of how the technology works,” Daaboul said.

“George is brilliant and understands the science, the optics, the biology, extremely well,” Freedman said. “My expertise was electrical engineering, so software, hardware, and optics is where I played.” Together, they seemed a perfect match for a startup looking to bring a new analytical tool to market. “We were especially strong on the technical side,” Freedman said. “That’s been our secret sauce.”

The platform that Daaboul and Prof. Ünlü developed uses interferometry, which “basically took advantage of how we combined the illumination light and the light which interacted with the biomaterial of interest,” Daaboul said — along with a superbright source of light and a silicon chip typically used to make computer chips to detect viruses. With the biophotonics platform that Daaboul and Prof. Ünlü developed, researchers could have the ability to detect things that have traditionally been invisible to them.

“Using traditional technologies, you have to accumulate a certain amount of virus to be able to see them,” Freedman says. “Our technology lets you see individual nano particles, like viruses.”

Founding NanoView

Freedman and Daaboul formally filed the paperwork to start a company in 2014. The early years were lean ones for Freedman and Daaboul, who survived off grants. Their first contract was through [Professor Connor’s NIH R01 grant](#) that was the primary support of the company for the first three years. They were still developing the product and a long way from customers that might pay them for their creation. One key moment, both Freedman and Daaboul agree, came when they were awarded an [Innovation Corps grant](#), or I-Corps™ grant, from the National Science Foundation (NSF). The I-Corps program had been established to help engineers

and scientists build their skills as entrepreneurs. “I don’t think this company would have been successful without that experience,” Freedman said.

Under the terms of the I-Corps grant, which they received in 2013, the pair was required to talk to 100 people to learn where there was a need in the market, which in NanoView’s case included doctors, hospital administrators, and people with the insurance companies that would need to pay for such a device. “That’s when we started focusing on commercialization,” Freedman said.

The program also required the pair to team up with a business mentor, which is how they connected with Rana K Gupta. Gupta, who had been the CEO of a successful diagnostic company spun out of Yale University, was teaching a technology transfer class at BU’s Questrom School of Business. [Professor John Connor introduced](#) Freedman and Daaboul to Gupta, who today serves as the university’s Director of Faculty Entrepreneurship. The pair also met [Parker Cassidy](#), a BU engineering grad who proved not just a champion of their technology and mentor but also an early investor.

NanoView moved into the BIC at the end of 2014. “We probably moved six times on the sixth floor of that building because we kept growing,” Daaboul said. They leased an optics lab at the BIC and then a private bio-safety level 2 lab—required to work with human blood samples. The university kept reminding the pair that they couldn’t stay at the BIC forever, but they remained there for more than three years, moving from a shared cubicle to a pair of large suites and a conference room they used as a manufacturing space.

“We weren’t looking to take the easy path,” Freedman said. “But the more we looked around for space and the costs, it was very attractive to stay at the BIC.”

As part of I-Corps, the pair taught themselves about “product-market fit” – the need to find markets for the device they wanted to sell. Initially, Daaboul and Freedman thought they would focus on a rapid respiratory diagnostic that could tell a parent if their child has RSV or the flu. “We learned that there were already a lot of great technologies for rapid diagnostics, and we were never going to be competitive there,” Freedman said. That would be the first of many pivots to alternative markets.

“We were pivoting all over the place for a couple of years there,” Freedman said. “We did early detection of Type-1 Diabetes. At one point, we looked at hepatitis diagnostics.”

“We had this great hammer, but what’s the nail?” Freedman said.

Serendipity had meant the two of them remained on campus in 2009. And in 2016, it meant a fellow researcher and collaborator (she is still paid royalties for helping with the chemistry side of the science they use) asked to buy one of their devices to study exosomes – [tiny sac-like structures](#) formed inside cells and released into the blood by many types of cells, including cancer cells.

“We were like, ‘What are exosomes?’” Freedman confessed. “Never even heard of them.” But the pair did their research, which told them this was an exciting area of nanoparticles

important to researchers. “We learned very quickly that the the exosome-field-needed tools and all we had to do was make small changes on our chip to detect them,” Freedman said. “And all of a sudden, we had a product in this whole new rapidly growing space.”

With the pivot to exosomes, they’d found their product-market fit. “That’s when investors paid attention,” Freedman said. NanoView raised \$4 million in a Series A first round of venture funding in mid-2017. “We were just building, we weren’t generating revenue, so the pressure wasn’t there,” Freedman said. The company moved out of the BIC in 2018, into offices in Brighton. That summer, Jerry Williamson took over as CEO of a company that had grown to more than a dozen employees. Williamson, who had earned his MBA at Questrom, had joined the board of their company the prior year. “We recognized that we needed more than the two of us to run things if we were going to be successful,” Freedman said. “And Jerry brought experience having been a successful CEO.” A few months later, the company raised another [\\$10 million in venture funding](#).

Post-BU: Growing the Company

NanoView launched its first product in 2019 at the international conference of the Society for Laboratory Automation and Screening in Washington, D.C., where it was one of three entrants out of 56 honored with a [New Product Award](#). “That’s when we really started learning what customers want,” Freedman said.

NanoView didn’t take off in the fashion of a rocket ship, as sometimes happens with startups. COVID provided one blow. The company was showing momentum, but a lot of the academic research labs were shut down and those that were operating were open were hardly focused on exosomes. NanoView was up against much larger, entrenched competitors and though they believed their technology was superior, they were still at the point where every sale was a custom job. “You want that flywheel spinning,” Freedman said. Instead, it was a grind.

Growth for the company returned in 2021 and resulted in a strong year for NanoView. In early 2022, NanoView began developing a product for the cell and gene therapy market. That, Freedman and Daaboul believe, is what drew the attention of Unchained Labs, which purchased the company in May of that year. The deal terms are undisclosed, but Daaboul and Freedman feel that the technology has found a great home and that the founders and investors had a successful journey.

The pair worked long enough at Unchained Labs to see its product relaunched under the brand name [Leprechaun](#). “They’re great at commercializing. That’s what they do,” Daaboul said of Unchained. “Basically, we got the product to the point where they can start selling it.” The two left around nine months after the sale, in early 2023 and, after a few weeks of much-needed rest and rejuvenation with family, have slowly started to work their networks in search of what might be next. “Ultimately, I would love to start another company,” Freedman said. Both are hoping to work as advisors and mentors to others just starting the path that they travelled.

“The thing I love about our experience is that at BU, I always felt like we were all on the same team,” Daaboul said. “Everyone was so supportive in helping us get things off the ground.” Both Daaboul and Freedman are keen to do what they can do to help younger versions of themselves on their entrepreneurial journey, especially if they have an affiliation with BU, because they want to give back for all the help they received along their journey.