

# BUTTERFLY WINGS SHOW HOW SFU RESEARCH CREATES COMMERCIAL METAMORPHOSIS

Smart investments in university R&D help turn ideas and discoveries into real-world solutions

**IT'S DOUBTFUL THAT SOCCER FANS ATTENDING THE 2016 EUROPEAN CUP** finals were aware of what inspired the rainbow-coloured security measures embedded in their tickets – the wing structure of a neotropical butterfly.

In 2009, Clint Landrock was a graduate student in Simon Fraser University's Applied Sciences department. On his honeymoon in Costa Rica, he and his wife ventured up a dormant volcano. There, they were transfixed by the iridescent wings of the Morpho butterfly.

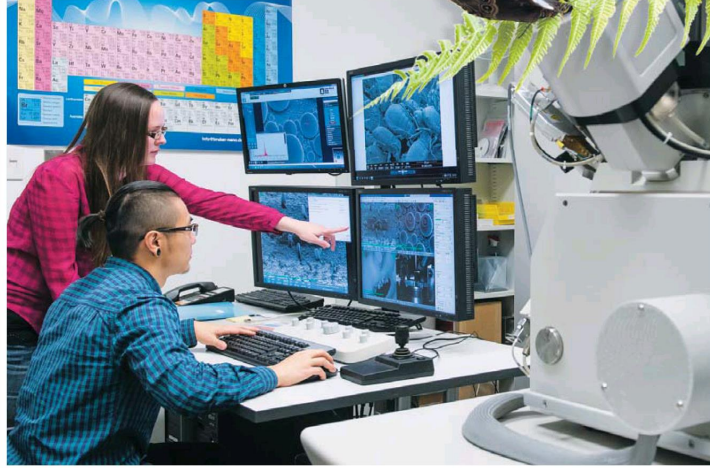
"What struck me was that we were underneath this dark canopy created by a thick forest, but the wings had these brilliant blue flashes," recalls Landrock. "It got me interested in how that was happening."

Landrock, now chief technology officer at Nanotech Security Corporation in Burnaby, B.C., helped turn a nature hike and his inquisitiveness into a multi-million dollar enterprise. None of it would have happened without the assistance of SFU's research resources.

Universities play a critical role in Canada's research ecosystem and building the country's innovation capacity. Investments in higher education R&D not only grow the body of knowledge across every realm, they also nurture discoveries with huge commercial potential for products and services.

SFU is a hive for those activities. SFU Innovates, a university-wide strategy, helps students, researchers and companies put their discoveries and ideas to work. That includes 4D LABS (a material science research centre), Innovation Boulevard (a health technology precinct), RADIUS (a social innovation incubator), and VentureLabs (B.C.'s most productive business accelerator).

Back in 2009, Landrock had no idea where his interest in the Morpho's wings would lead. Working with SFU researcher Dr. Bozena Kaminska, he learned that the wings' vibrant colour wasn't derived from pigment, but from nano-sized holes that trap and reflect light.



The SFU Innovates strategy supports big innovations in products and services SFU

"It occurred to us that if we could harness this phenomenon it would have real-life applications to holographic technology," says Landrock.

So the pair took their findings across campus to Coast Capital Savings Venture Connection®, SFU's early-stage business incubator. There, they were encouraged to develop their idea into a commercial anti-counterfeiting technology.

The result was Nanotech Security Corporation, which can "print" materials without ink via holes that reflect light – some 500 million holes on an area the size of a little fingernail. Much of the initial development was done in 4D LABS. Today Nanotech is one of the world's premier providers of anti-counterfeiting technology for everything from event tickets to banknotes.

"4D LABS allowed me to develop the processes, keep the intellectual property and grow from a grad student's curiosity into a leading company," says Landrock.

Success stories like Nanotech are not one-offs. They're examples of what can happen when links are forged between university research, business knowledge and consumer needs.



NANOTECH SECURITY CORPORATION



Euro 2016 tickets used anti-counterfeiting technology that was incubated at SFU NANOTECH SECURITY CORPORATION

"We have sought to bridge this divide by developing new ways for researchers to engage with industry and communities," says SFU President Andrew Petter.

Grants from government and other investments fuel this essential research. The rate of R&D in Canada's private sector lags behind that of other advanced industrial economies. That makes the research activities of academic institutions even more critical. According to Statistics Canada, universities perform about \$13 billion in R&D, including \$1 billion in research for business and \$1.2 billion for the not-for-profit sector.

By combining university research capacities with entrepreneurial creativity, Canada could increase its contribution to the innovation economy, says Joy Johnson, Vice-President of Research and International at SFU.

"It's about fostering discoveries with huge commercial potential, like Nanotech, to ensure Canada is competing on a global scale," says Johnson. "Many of these innovative ideas may come from start-ups or smaller shops that lack the capital to access costly R&D, so we work to make that support available to them."

Indeed, SFU continues to be a crucial part of Nanotech's success story. As the company takes on new projects and works with central banks all over the world to develop anti-counterfeit currency products, its R&D needs are likely to intensify.

"It's still such a big part of our business," says Landrock. "We have someone in the 4D LABS working every day."

It's just another way that universities like SFU are harnessing research to generate beneficial – and profitable – solutions.

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