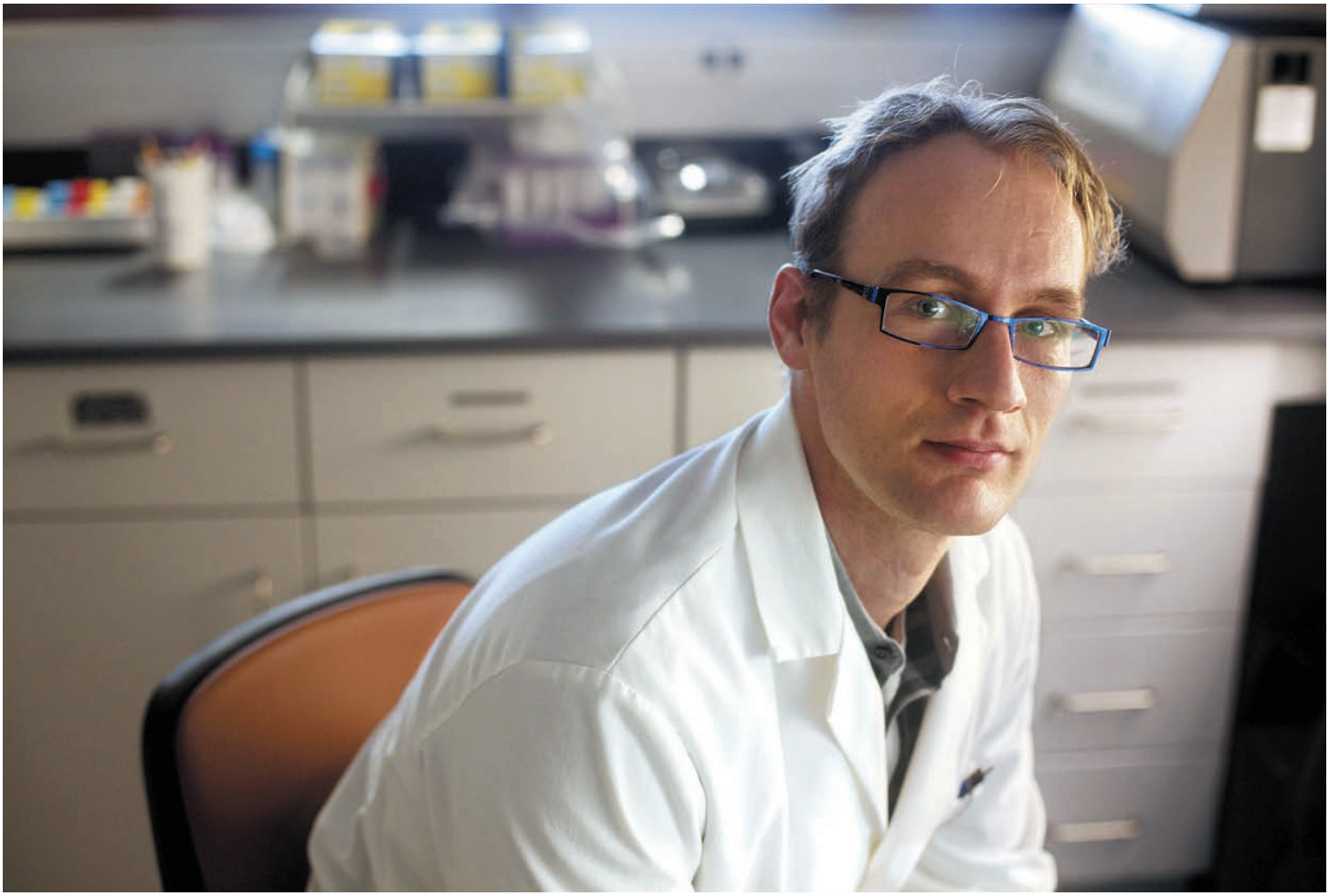
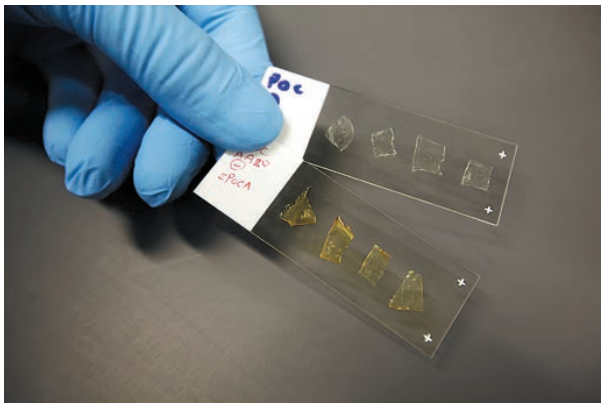
Reaching across disciplines and cultures



Biomedical engineering graduate student **Robert van Lith** *has spent the last five years honing new approaches to vascular therapies that could ultimately improve the quality of life for millions of patients.*

It's a notable accomplishment: his work has garnered two patent applications and several academic papers. But his most valuable talent may lie in his ability to reach across cultures and disciplines to innovate. His early career has already spanned three continents and includes training from some of the top business and technology transfer professors at the University.

"One of the great things about Northwestern is that it's very collaborative, very interdisciplinary," he says. "It has been great to interact with people from so many different backgrounds and disciplines."



Van Lith's interest in medicine began during childhood, in his native Netherlands, when his older brother became a physical therapist. But he soon noticed that his best work was in the hard sciences: physics and math. "I didn't really want to squander what I was good at," he said, "so I started looking into engineering."

He majored in biomedical engineering—a new discipline at Eindhoven University of Technology—and stayed on for a master's degree. During that time he enrolled in a research internship at Osaka University in Japan and fell in love with the Japanese culture.

"It was so different, yet I felt completely at home," he says. "I got along really well with people in Japan." It also appealed to his engineering nature, he said: the cities were big and chaotic but well organized.

So after graduation he was selected for a special program run by the Dutch government that sent young professionals to Japan for a year. There he worked for Olympus's Life Sciences division on a new microscope prototype for cell and tissue research. The experience in industry was great, he said. But he wasn't ready to give up on academia; he felt that if he wanted to do research and development in industry he'd need a PhD. He applied to several graduate schools in the United States and Canada but ultimately chose Northwestern, not just for its top-quality research, but also because of the vibe he got when visiting.

"The students here seemed much happier," he says. "And I loved Chicago, loved Lake Michigan. The people here are laid-back, and I enjoy living in a place with four seasons."

As a student in the lab of Guillermo Ameer, professor of biomedical engineering and surgery, van Lith has conducted research on the interplay between polymers, drug delivery, and tissue engineering. He is currently developing a polymer to coat synthetic grafts for bypass surgeries. In patients with diseases such as atherosclerosis, synthetic grafts, which are used to replace blood vessels, often fail in vessels with small diameters. Surgeons and scientists believe that injury to the inner cell lining causes oxidative stress, resulting in the vessel's becoming occluded. Van Lith and his lab colleagues are developing a graft with antioxidant properties to alleviate the stress. Because it is believed that the injury is due to the lack of nitric oxide, van Lith is also working to modify a peptide to deploy nitric oxide at the site of the surgery.

Along the way, he's also trying to understand the relationship between oxidative stress and nitric oxide. "They are related, but we still do not know how," he says. "Everybody is trying to discover the exact nature of their connection."

That ability to conduct both basic science research and direct application research has contributed to his success, says his adviser. "Robert is very smart, hard working, and always willing to take on new projects," Ameer says. "He is very dedicated to research."

Van Lith also attributes his achievements in part to his collaboration with Melina Kibbe, Edward G. Elcock Professor of Surgical Research at Northwestern's Feinberg School of Medicine. That sort of cross-disciplinary collaboration offers immediate feedback: surgeons can immediately tell if an innovation would actually be feasible or useful.

But van Lith isn't content to be in the lab for the rest of his career: he wants to bring his innovations to the marketplace. "Research developed in academia can be very slow moving into the real world," he says.

To get a better handle on the process, van Lith served as an Innovation to Commercialization (I2C) fellow this past summer. The program, offered by Northwestern's Innovation and New Ventures Office, gives selected students experience in researching intellectual property for innovations developed at Northwestern.

Van Lith and his colleagues learned how to develop patent applications, protect IP rights, and understand product licensing. He developed a business plan—including a competitive analysis and possible funding opportunities—for a Northwestern professor's anticancer drug.

At the same time, he also participated in Business for Scientists and Engineers, an eight-week leadership program for science and engineering graduate students that draws on the Kellogg School of Management's core MBA curriculum.

"These two programs were perfect complements to each other," van Lith says. "They were great opportunities to learn how to move products into the real world."

Though van Lith is undecided about what he'll do after he finishes his degree this year—maybe start his own company, maybe work for a startup—he is certain that Northwestern has helped prepare him for an interdisciplinary career.

"At Northwestern, you have the resources and opportunity to develop yourself and your skills however you want," he says.

M Emily Ayshford

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