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### CAREER DEVELOPMENT : ARTICLES

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### A Karolinska Doctoral Candidate Learns the Joys of Business Ownership, Research, and Fatherhood

Lucas Laursen  
Sweden  
7 September 2007

Mohammed Homman is in no hurry to defend his dissertation. It's not because the Karolinska Institute doctoral candidate needs more time to write or perform a few more experiments. Nor is it because he needs to be home most days by 5 p.m. to help his wife, Maria Homman, who heads her own research and development lab at Akzo Nobel, care for their two daughters. Homman is taking his time to finish his degree because he's busy wooing investors, hiring researchers--some of them with their own doctorates--and establishing business partnerships. Finishing his degree just isn't his highest priority right now.

There's also the pesky matter of patents. Announcing his results publicly in the form of a dissertation might interfere with the two pending patents his company, [Vironova](#), needs to grow. Homman started the bioinformatics company in 2005 to commercialize technology he developed that automates virus detection using digital images from electron microscopes. Homman, who is 33 years old, is CEO of the company, which has 11 employees and has raised more than \$5 million in capital so far. The target in the current fundraising round is \$50 million.

How does he get it all done? "I do not get much sleep," he says cheerfully.

"I like to move very fast and take a lot of risks compared to the traditional Swedish way."

--Mohammed Homman

#### STUDENT DAYS

Homman's initial studies, which earned him a B.S. in biology and an M.S. in chemistry at Uppsala University in Sweden, were intended to prepare him for a career in medicine. At the Karolinska Institute outside Stockholm, he aimed to work on bone-marrow transplants, but under the supervision of virologist Cecilia Söderberg-Nauclér he found himself studying human cytomegalovirus (CMV) using electron microscopy.

The work required him to examine films from electron microscopes to classify and count viruses. Developing a set of 100 film negatives could take up to a week using traditional methods. He grew frustrated with the slow pace and the technology's limitations. "You see something and everybody interpreted it their own way," he says. He recognized the need for an objective way of measuring viruses.

Homman decided to use digital imaging technology--widespread in other scientific disciplines, such as astronomy--to quantify image data. He collaborated with a mathematician at the Royal Institute of Technology's Center for Industrial and Applied Mathematics and a computer scientist he has since hired from the joint Centre for Image Analysis at Uppsala University and the Swedish University of Agricultural Sciences. Both were students like him, Homman adds, "and our professors were not doing so much at all. We did all of the work ourselves."

At academic conferences such as the International Herpesvirus Workshop where Homman presented the work, some researchers began asking him to do image analysis for them, but more tellingly, others asked how much his analysis would cost. He realized that his work had potential for more than the usual academic rewards: It could also generate cash.

Homman's idea was too risky to get traditional funding, but the Swedish business investment vehicle ALMI provided early funding in 2005. ALMI renewed its support in a July 2007 funding round. "They [ALMI] are the real risk takers when it comes to financing this company," he says.

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Homman went on academic leave and began working on the company in earnest. One arm of the company is already selling the sort of antiviral research assistance that his conference attendees requested early on--making use of proprietary techniques to identify and disable certain proteins in viruses. The other arm of the company is developing software that Homman expects to be licensed to academics and other companies that want to detect, identify, quantify, and classify viruses.

The rate at which his research progressed caught nearly everyone by surprise. "I don't think one would have expected that it would have developed ... so quickly," says Göran K. Hansson, a professor in the Karolinska Institute Department of Medicine where Homman worked. "And that reflects ... on the set of methods Mohammed has developed and also on his dynamic personality."

### CHIEF EXECUTIVE OFFICER

Vironova hired a handful of researchers, programmers, and business managers in 2006 and is already looking to expand further. Homman casts a wide net, traveling internationally to raise money and market his company. His approach has met with success in Sweden, where he has won the ALMI Innovator of the Year prize, among other awards, and abroad, where he has lined up venture capital and partnered with heavyweights such as IBM. He says he has raised far more money internationally in 2 years as an untrained businessman than he could have expected as a graduate student or postdoctoral researcher in academia.

"I like to move very fast and take a lot of risks compared to the traditional Swedish way," he says, pointing to steady, slow-growing Swedish successes Ikea, Ericsson, and Saab. Comparing the venture to his academic career, he shrugs, "I guess I didn't have much to lose--a little money, a little time. But you can do that in science, too. Now I am able to be my own supervisor, at a younger age than I could in academia, and I'm probably better funded."



**Close birthdays.** Mohammed Homman's company Vironova was born around the same time as his first daughter, Ida, now 2.

Still, to succeed in the long term, Vironova will need to convince the scientific community that its products are worth investing in. Hansson thinks that achieving widespread adoption of Vironova's products will be a major task because "you always have to prove each technique that comes along" before scientists will adopt it.

Homman hasn't had any trouble convincing co-workers, though. They say his confidence makes him a natural leader. Jonas Velander, Vironova's vice president for business development, says, "He can make people really love what they do." Velander also nods to Homman's vision and optimism. "He has lots of ideas and is always looking forward, and he handles [failure] ... really well. He's always ready to move on."

### FATHERHOOD

Homman works hard and travels frequently, but he tries to be home as much as he can to be with his family. His company was born around the same time as his first daughter, Ida. That year, his annual report listed just one employee--himself. As his business has grown, so has his family. Homman and his wife, Maria, now have two daughters--Ida, now 2, and Leila, 8 months. They live close to both sets of parents, who help with the children.

Maria has known Homman since high school, and their long relationship has been an asset at work and at home. "When you have been living together that long, ... you already know what you like and what is working at home," she says. That leaves more energy to focus on work and raise their daughters.

But even all that energy can't extend the day beyond 24 hours, so Homman has adapted his working schedule to fit his home responsibilities. Maria is a "modern Swedish woman," Homman says. "I don't have a wife who irons my shirt and cooks for me, so I'm home at 5 and I do half. When my daughters go to sleep, I start working again."

Lucas Laursen is a science writer in Cambridge, U.K.	Comments, suggestions? Please send your feedback <a href="#">to our editor</a> .
Photos. Top, credit: Jan McLaughlin. Middle, courtesy Mohammed Homman	DOI: 10.1126/science.caredit.a0700127

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