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Science Goes to Work

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As president and co-founder of Essen BioScience, Kirk Schroeder ’84 creates high-tech innovations and American jobs.

Story by SALLY POBOJEWSKI

Kirk Schroeder ’84 is more comfortable in jeans and T-shirt than a suit and tie. He’d rather partner up for a game of euchre with colleagues at lunch than network with other business executives. He drives a 1995 Dodge Ram pickup, not a Lexus. And he’s much more interested in talking about his company than in talking about himself.

He may not fit the stereotype, but Schroeder, 49, is an all-American business success story as president and co-founder of Essen BioScience, a privately owned company with 66 employees.

Schroeder monitors progress in a lab at Essen’s Ann Arbor headquarters. (Photo by Leisa Thompson)

Based in Ann Arbor, Mich., Essen develops and manufactures high-tech research instruments and provides research services for clients in the global pharmaceutical and biotechnology industries. To date, the company’s inventions have accounted for nearly $1 billion in worldwide sales.

Schroeder and his business partner, Brad Neagle, built Essen from the ground up the old-fashioned way. No venture capital funding. No leveraged buyouts. Just innovative ideas, sweat equity and hard work.

At a time when most U.S. businesses are outsourcing to reduce operating costs, Essen’s products are still made in America, and Schroeder intends to keep it that way.

“We do everything possible ourselves,” says Schroeder, sitting in his small office with minimalist décor — bare walls, one small desk lamp and a computer — at Essen’s newly renovated, 25,000-square-foot headquarters. “We do our own R&D, we write the software, and we use a local machine shop to make most of the component parts.”

Creating local jobs and manufacturing products in the U.S.A. is a point of pride for Schroeder. He also believes that controlling the entire process gives Essen a competitive advantage. “Every time we’ve given up control,” he says, “it’s proven to be a mistake.”

From garage to breakthrough

Schroeder, left, and business parter Brad Neagle work out a manufacturing schedule for their newest product, IncuCyte. (Photo by Leisa Thompson)

Schroeder’s work ethic and independent streak have roots in his rural upbringing on his family’s farm near Watseka, Ill. He arrived at Illinois Wesleyan in 1980, selected physics as his major and studied with professors Gary Kessler, Lew Detweiller and Ray Wilson. As a sophomore, he was awarded IWU’s Scott Anderson Scholarship for Physics.

Schroeder says his physics major taught him how to solve problems and gave him confidence that he could understand any field of science. In addition, the liberal-arts focus of his Wesleyan education — including classes in philosophy, writing and religion — helped him succeed in business.

“My job mostly involves negotiating, hiring, forming collaborations and planning,” says Schroeder. “The liberal arts education certainly helped with the communication and writing skills I use every day.”

After graduating from IWU, Schroeder enrolled in graduate school at the University of Illinois to study applied optics. After receiving his master’s in electrical engineering in 1986, he moved to Ann Arbor to start his first job at the nonprofit Environmental Research Institute of Michigan (ERIM). Schroeder worked as a research engineer in the optical science laboratory that did contract work for the U.S. Department of Defense.

“It was during the Reagan ‘Star Wars’ era, so we got to work with expensive lasers, optical instruments and solid-state sensors,” he says. “That technology field was really blossoming at the time.”

At ERIM, Schroeder first met Neagle, a shy, quiet University of Michigan engineering student who worked down the hall. The two became close friends.

“Kirk was a weight lifter who worked out for three hours every day and ate tuna straight out of the can,” recalls Neagle, 47. “He was pretty intense and never did anything halfway.”

Through “a friend of a friend,” Schroeder and Neagle learned of a new project at the pharmaceutical firm Upjohn that would change their lives.

At Upjohn, researcher Vincent Groppi had developed a lab test to measure membrane potential, which is the voltage difference between the inside and outside of a cellular membrane. Membrane potential governs a cell's ability to send and receive signals in the form of electrically charged particles called ions.

Upjohn saw potential for using this process to test the effects of hundreds of thousands of experimental drug compounds on cells. Today, this type of testing — called cell-based, high-throughput screening — is a staple of preclinical, drug-discovery research. But there was a hurdle to make the test a reality. It required a new kind of scientific instrument: one that incorporated optics, fluidics, automation and integrated software.

With their experience in lasers and optics, Schroeder and Neagle believed they could build such an instrument. They were engineers, not life scientists, but Groppi offered to teach them the biology. Schroeder and Neagle convinced ERIM to provide some funding and Upjohn agreed to buy the prototype, if it worked.

After a few false starts, Neagle and Schroeder built a prototype device that could measure electrochemical activity of 96 living cells simultaneously. They called it FLIPR (short for Fluorescent Imaging Plate Reader). Upjohn's researchers were so excited by FLIPR's potential that Schroeder thought other companies might want one, too. Cold-calling pharmaceutical scientists at other firms doing similar research, he learned he was correct.

Schroeder and Neagle began making FLIPRs in a local garage. Each unit required well over $100,000 in parts and took months to build. With so much time and money invested, they did not trust shipping the product so instead drove rental vans to deliver FLIPRs to customers themselves.

"All the money we had in the world was in that van," Schroeder says. "We drove one to New Jersey and parked it outside the gates at Merck waiting to deliver first thing in the morning. It was just down the road from Rahway State Prison, not in the best neighborhood. When we woke up that morning, one of our tires was missing."

By the spring of 1996, the pair had orders for about 10 FLIPRs. Although both had left their jobs at ERIM to meet the demand, they struggled to keep up. So they accepted an offer from a West Coast company, Molecular Devices Corporation (MDC). MDC purchased rights to the FLIPR technology, hired Schroeder and Neagle and moved the entire operation to its Sunnyvale, Calif., headquarters.

At first, being part of the corporate world was a positive experience, says Schroeder. He and Neagle now had time to develop new applications for FLIPR — including a system that could detect calcium ions within a cell, a signal that key receptor molecules in the cell's membrane had been activated. But after a few years, they began to chafe at the restrictions of working for a large corporation. Neagle had two young daughters and wanted to raise his family in Ann Arbor. So, in 1999, they left Molecular Devices and moved back to Michigan to start a new company, Essen Instruments.

All-American business model

As Essen grew, a division of labor developed between the two partners. Neagle handled the engineering, while Schroeder focused on the biology and business management.

Schroeder observes as Essen application scientists test a new cell culture insert, measuring cell migration. (Photo by Leisa Thompson)

"My skills are in solving engineering problems," says Neagle. "Kirk has those skills, too, but his strength is in understanding the biology. He can take any problem and figure out how to solve it. He's constantly training and learning new things."

"I'm more of a risk-taker and Brad's a little more conservative in this respect," Schroeder says. "From a business-decision point of view, this is a good thing. I always think things are going to be easier and more doable than they really are, and Brad's influence helps insure we don't get too far ahead of ourselves."

First on Essen's drawing board was a product called IonWorks. It was designed to automate a common lab procedure called a patch-clamp test that's used in drug-discovery research to measure the electrical activity of individual cells. Instead of taking 15 to 20 minutes to conduct a patch-clamp test on one cell, Essen's IonWorks prototype could test 384 cells simultaneously.

Patent complications and the fact that Schroeder and Neagle didn't have the money to self-fund its entire development led to their decision to license the IonWorks technology to Molecular Devices. IonWorks turned out to be a second blockbuster product for the California firm. Royalties from IonWorks sales provided some much-needed financial security and helped Essen grow, but Schroeder still regrets having to give up the product that Essen had developed and nurtured.

Schroeder plans to retain Essen ownership of its newest product line, IncuCyte, a system that captures microscopic images of living cells as they grow inside an incubator. IncuCyte gives researchers the ability to monitor cells continuously, leading to better understanding of how cells respond to changes inside the body.

"The one thing Brad and I have always done differently than a lot of instrumentation companies in our area is that we understand and perform the biology in-house," Schroeder says. "We build better tools and assays, because we actually use the tools that we build in our service business."

Emphasizing customer service and maintaining "lifetime bonds" with customers are part of Essen's success, according to Schroeder. So is bringing researchers who are creative and highly motivated. Many of the scientists he and Neagle worked with prior to launching Essen are now employed by the company or serve on its board of directors.

Essen BioScience's newly renovated, 25,000-square-foot headquarters.

In recent years, Schroeder has seen fundamental changes sweep through the pharmaceutical industry. Many of his original customers — major corporations like Merck, Astra-Zeneca and Pfizer — have sold or downsized most of their drug-discovery research facilities in favor of cheaper labor overseas or alternative business models. New, smaller pharmaceutical and biotechnology companies are being created to fill the void, but they can't always afford or have the process demands of a half-million-dollar research instrument.

So Essen now has a new business model and a new name: Essen BioScience. Instead of focusing solely on developing, manufacturing and selling research instruments, Schroeder says the company also performs drug-screening assays on a contract basis for small, start-up firms.

"It's another way for us to get access to customers," he says. "We're also developing collaborative drug-discovery projects with some of our customers."

Schroeder doesn't have much good to say about the current state of American business, especially domestic manufacturing. He blames an emphasis on short-term profits for the recession that has closed factories across the country and sent millions of Americans to unemployment lines.

"To keep and grow jobs, you can't make business decisions based on what's good in the next three to nine months," he says. "You have to invest in the future. Right now, we're reinvesting just about everything we make in this company. If we were a public company and I had investors breathing down my neck about this quarter's earnings, we couldn't do that."

Proof that Essen's business model is working: It is in its seventh consecutive year of organic revenue growth and recently opened offices in England and Japan for sales, service and support of its U.S.-made products in European and Asian markets.

Schroeder has a two-word solution to America's economic crisis: "build stuff," and build it in this country. "When manufacturing goes overseas, R&D soon follows along with the knowledge base necessary to innovate. In my opinion, if you want to generate jobs, you need to design and build things."

Despite his strong opinions on domestic manufacturing, Schroeder likes to let the products and services provided by Essen's Michigan employees do most of the talking.

"I'd prefer to fly beneath the radar," he says, looking eager to get back to the busy job of putting business and science to work.