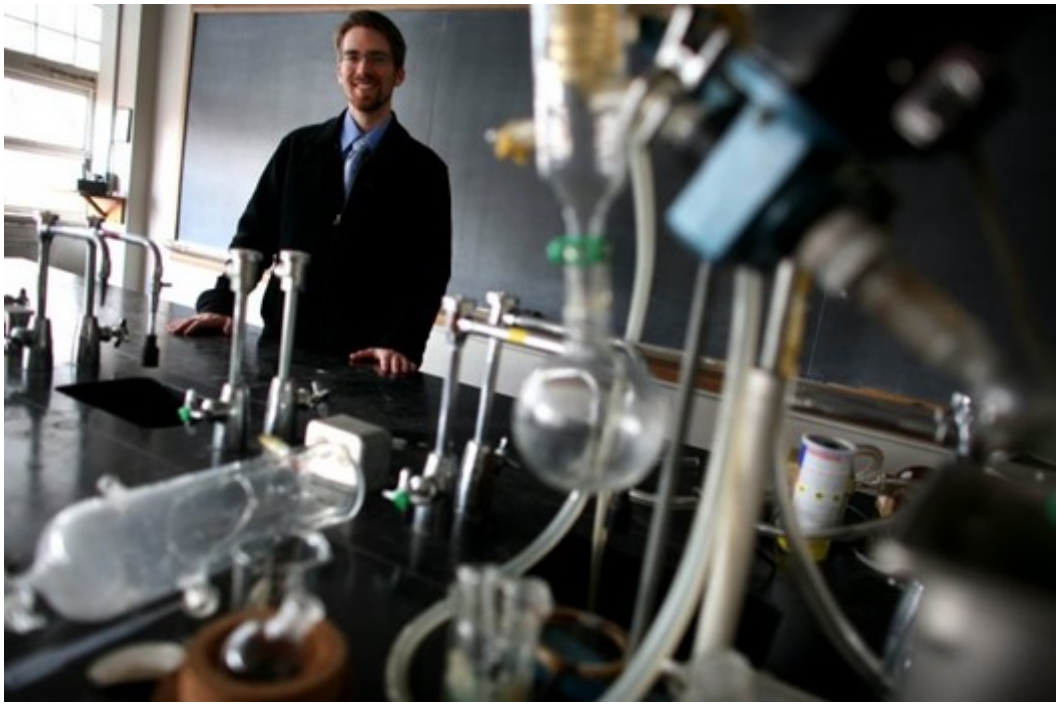
Five for the future: Minnesota's emerging industries

As Minnesota's medical device industry matures, state and industry officials worry what new technologies are in the pipeline. Here is a closer look at some promising possibilities.

By THOMAS LEE Star Tribune | **APRIL 16, 2013 — 10:24AM**



JERRY HOLT, STAR TRIBUNE

Brian Krohn, a senior at Augsburg, will graduate with degree in chemistry and is the first student from Augsburg to win a Rhodes Scholarship.

Call it a serious case of high-tech typecasting.

Minnesota is arguably one of the country's top producers of cardiac-based medical devices -- pacemakers, defibrillators, stents and valves. But aside from Medtronic Inc., Boston Scientific, St. Jude Medical and the plethora of device-related start-ups and spin-offs, how deep does the state's innovation bench go?

Judging from the national venture capital community, not very deep. In 2008, local medical device companies captured nearly two-thirds of all the VC money that flowed into the state. That's pretty much been the case, year after year, for a decade. With a few exceptions, national venture investors firmly peg Minnesota as a medical device center. Period. End of story.

That's not such a bad thing. The Medtronics and St. Judes still produce healthy profits and boast nearly $30 billion worth of combined research and development spending a year. If medical devices is what we're good at, why not just stick with it?

Because there is a growing belief among industry, state and academic leaders that Minnesota should diversify its high-tech portfolio. Even a company as mighty as Medtronic is not immune to the global recession and the pressure to control health care spending. It pared back its workforce in 2008 and has said it will make more cuts this year.

Replacing those jobs, the best paid ones in the state, was never going to be easy. But when you consider that Minnesota shed over 31,000 jobs in January and February alone, producing new high-growth industries suddenly takes on a sense of urgency.

"Minnesota is heavily dependent on the medical device industry for a significant portion of its economic health," according to Destination 2025, a report released last month by the BioBusiness Alliance of Minnesota and Deloitte Consulting. "As the [cardiovascular] market matures, its growth is slowing, or in some cases, shrinking."

With that said, here are five emerging industries in Minnesota that demonstrate innovation and the potential to have the most immediate impact on the state's economy, according to industry groups, investors and academic officials. These entrepreneurs, technologies and start-ups have attracted national attention or venture capital -- or both -- in the past year.

Bay-area bucks

If money talks, Steven Burrill is screaming from the rooftops.

The prominent San Francisco-based biotech investor is partnering with Tower Investments to create a local venture capital fund that sources say may hit $1 billion. The money will be used to lure start-ups to the planned Elk Run Biosciences Center outside of Rochester and to fund emerging technologies from the University of Minnesota and the Mayo Clinic.

The fund could address one of the most glaring problems in Minnesota: the lack of early-stage capital for start-ups that don't make medical devices. Biotech start-ups complain that risk-averse local investors tend to gravitate toward technologies they understand. As a result, industry and public officials have long warned that promising start-ups will flee Minnesota, preferably to regions where investors are more willing to write checks.

A fund of this size could provide a big "splash factor," to an emerging biotech industry, said Jay Hare, an analyst with PricewaterhouseCoopers in Minneapolis who tracks venture capital investment.

Hare normally disdains efforts to create biotech companies out of thin air. What makes the Elk Run project unique, he says, is not merely the size of the fund but the bioscience center's relationship with Mayo, a prestigious research center and a gold mine for intellectual property. That's presumably why Burrill would agree to such a project, Hare said.

U officials are also excited about the initiative.

"We have a lot of pitchers in this state but no catchers," said Jay Schrankler, a former Honeywell executive who was recently tapped to lead the university's Office for Technology Commercialization. "The biosciences center will be our catcher."

Doris Taylor's heart

The U has a lot riding on Dr. Doris Taylor. Or more specifically, her heart.

Last year, Taylor surprised the science world by growing a beating heart in a jar. Taylor and her team at the U's Center for Cardiovascular Repair stripped a rat heart of its cells and then infused it with cardiac cells from newborn rats, which multiplied and grew into a fully functional heart. They are also applying the technique to other types of animal tissue. Eventually, the technique might not only grow tissue to repair hearts but also whole organs, such as livers and kidneys, for patients who need transplants. Taylor was recently named to Time magazine's 100 most influential people of 2009 and appeared on the Oprah Winfrey Show last week.

Growing a human heart still might take decades. But the U isn't waiting that long to cash in. The school this year will spin off a new company based on Taylor's technology. The start-up will focus on helping pharmaceutical companies test new products on cells and tissue grown from Taylor's research. The technique will greatly speed the development of new drugs by determining, for instance, which people would be allergic to or intolerant of certain medications, said Doug Johnson, a former investment banker who runs the schools' Venture Center.

U officials say they received strong interest from venture capital firms on both coasts but decided to pursue a spin-off to maintain local control over the technology. Johnson said the school is determined not to repeat the same mistakes it made with Gopher. One of the world's first true Internet browsers, Gopher faded into obscurity after the U failed to commercialize it.

The school could also use a hit product. Its patents on Ziagen, an anti-AIDS drug that generates nearly 95 percent of its royalty income, will soon expire.

Taylor's work could be the school's next blockbuster technology, comparable to the pacemaker and heart valve, which the university helped invent, Johnson said.

"We're looking for things like Doris' [work] to change the world," he said.

Right man at the right time

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Doug Cameron is the clean-tech guru who last year joined Piper Jaffray as its chief science officer. Cameron will also help manage the investment bank's alternative energy portfolio. With President Obama pushing green energy, getting Cameron is not only a coup for Piper but also for Minnesota, where scientific talent and investment expertise in clean technology is in short supply.

Cameron, an MIT graduate who formerly ran Cargill Inc.'s biotech program, has already put Minnesota on the map. As chief science adviser to Khosla Ventures, Cameron successfully pushed the prominent Silicon Valley VC firm to invest in two local clean-tech start-ups that might have otherwise escaped notice.

Segetis Inc. of Golden Valley is developing agricultural feedstocks as substitutes for plastics and specialty chemicals made from petroleum. Draths Corp. of Plymouth is combining biology and chemistry to produce environmentally friendly nylon fibers.

Last month, Segetis opened a pilot production plant that will produce 250,000 pounds per year of chemicals and chemical building blocks from renewable resources. The plant will allow potential customers to runs tests on Segetis' materials. The start-up also is raising money to build a larger scale production facility. Segetis' technology works and is ready for sale, said CEO Jim Stoppert.

Poultry tech

Willmar has come a long way from turkeys. And Minnesota could benefit.

Epitopix, a spin-off from the Willmar Poultry Co., recently won a conditional license from the United State Department of Agriculture to make and sell the country's first animal vaccine against a deadly strain of E. coli bacteria.

The company is a good example of how the state can tap its core competency in food and animal science to develop new technologies and industries, said Dale Wahlstrom, CEO of the BioBusiness Alliance of Minnesota.

Experts say there is a strong need for such a vaccine. Preventing E. coli from seeping into the human food supply has long vexed the $74 billion beef industry. Until recently, beef producers focused on rigorous monitoring, cleaning and testing of animal parts, as well as consumer education.

E. coli O157 infects about 70,000 people each year, according to the Centers for Disease Control. There are few, if any, direct treatments for patients; antibiotics have proved largely ineffective, the CDC says.

Epitopix hopes to start selling the vaccine to big meat processors like Cargill and Tyson by summer, the height of the cattle slaughtering season.

Willmar Poultry also spun-off Syntiron, which uses the same technology as

Epitopix to combat human diseases like anthrax and bubonic plague.

Biodiesel breakthrough

Who knew that a possible solution to the country's dependence on foreign oil lay with a small liberal arts college in Minneapolis?

The "Mcgyan Process" inspired by the work of Augsburg College student and Rhodes scholar Brian Krohn, converts most feedstocks into biodiesel fuel without using much water or producing lots of waste.

Ever Cat Fuels, a start-up co-founded by Augsburg alumnus Clayton McNeff, recently completed a $5 million plant in Isanti that eventually will produce 3 million gallons of biodiesel fuel a year.

The technology is the real deal, said Piper Jaffray's Cameron.

"The floodgates could open," Cameron said. "Other communities around the country can do the same thing."

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