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Vials of silicon nanocrystals absorb light from an ultraviolet light source, not shown, and re-emit that energy as visible light. The nanocrystals also were dissolved into the polymer sheet held Tuesday by Dave Jurbergs, research and development director of InnovaLight, which moved recently to St. Paul's Menlo Park incubator project.

A WHOLE NEW LIGHT

U's work in nanotechnology attracts a start-up to St. Paul to work on lighting's next generation.

BY JIM McCARTNEY
Pioneer Press

If you're a start-up company looking to invent a better light bulb, what better place to move to than an incubator project called Menlo Park?

In January, InnovaLight, which is developing what it calls "silicon nanocrystals," moved into Menlo Park, a St. Paul incubator for biotech and high-tech start-ups. The build-

ing's owner named the complex — an old crime lab on University Avenue — after the famous Menlo Park laboratories of Thomas Edison, the inventor of the light bulb.

Turns out, the name was not a factor in the move.

"It's totally ironic," said Paul Thurk, the chief executive of InnovaLight. "It never occurred to me until we moved in."

Rather, InnovaLight was attracted

AT-A-GLANCE

Name: InnovaLight Inc.

Product: Lighting using tiny spheres of silicon called nanocrystals.

Founded: Austin, Texas, 2003. (Moved to St. Paul in January)

Ownership: Company employees plus a variety of venture capital firms.

Annual revenue: None

Employees: 8 with plans to hit more than 20 by year-end.

What's next: Further developing and commercializing its discovery — using silicon nanocrystals.

to the resources of the University of Minnesota, which has a national expertise in nanotechnology, or engineering at the molecular level, with specks called nanoparticles that are

Nanotechnology

(continued)

measured in terms of billionths of a meter. Even common materials such as silicon — the basic ingredient in sand — perform differently when they broken down into ultra-tiny pieces.

One of the hot fields of nanotech these days is developing a more efficient and environmentally friendly form of lighting. The common household incandescent light bulb is woefully inefficient, and the fluorescent tube used in the workplace poses a hazardous-waste problem because of its mercury content, Thurk said. As a result, the U.S. Department of Energy is making a big push to get industry to come up with a better source of lighting, and a variety of companies see big opportunities there.

InnovaLight has eight employees at Menlo Park. It is looking for six more and expects to have 23 employees by year-end. The jobs come with attractive wages — about \$80,000 a year — and there could be a lot more if the company can commercialize its discoveries, Thurk said.

That's one reason Gov. Tim Pawlenty will use InnovaLight's labs as the site to introduce a statewide entrepreneur competition this morning.

The story of why InnovaLight moved to St. Paul goes back two years. The company,

working with researchers at the University of Texas in Austin, was having trouble developing an efficient process for making silicon nanoparticles.

Dick Sommerstad, assistant director of the office of business development at the University of Minnesota, said the company "asked if we had anyone here who had done work on spheres of silicon that were four nanometers or less."

In fact, the University of Minnesota and its Institute of Technology are world-renowned for research in aerosols and engineered nanoparticles. What's more, it had just the right researcher, Uwe Kortshagen, a professor of mechanical engineering at the institute. Kortshagen contributed a key invention: a method of making the tiny silicon spheres.

Thurk said the nanoparticles must be from 1.5 nanometers to 3.5 nanometers in width, with the size determining the color emitted by the particles.

Thurk also discovered that, largely because of the University of Minnesota, the Twin Cities area has a wealth of qualified nanotechnology researchers. InnovaLight had found it difficult to find employees around Austin and had to recruit from outside that area, adding to its expenses.

"The university (of Minneso-

ta) has a rich talent base from which we can draw," Thurk said. "On the particle side of nanotechnology, they are second to none."

In addition, the company liked St. Paul's bioscience zone and the city's eagerness to recruit them, said Alexander Wong, a partner in Apax Partners, a venture capital firm that is an investor in InnovaLight. Coincidentally, Apax is based in Menlo Park — the California town, that is.

Minnesota's biotech zones — Minneapolis and Rochester have them as well — help startups like InnovaLight by offering research and development tax credits and exemptions from a variety of state and local taxes, including sales taxes on purchases of equipment. InnovaLight also was attracted by the state's business climate with regard to developing high-tech companies, Thurk said. And the rent at Menlo Park was right, too. The firm, which leases about 4,500 square feet of lab and office space, is paying, on a square foot basis, about a fourth of what it paid in Texas.

InnovaLight hopes to introduce a low intensity form of lighting that could be used for cell phones and other high-tech displays. Later, it hopes to introduce higher-intensity lighting that can be used on ceiling panels, replacing fluorescent lights in office buildings.

But InnovaLight faces intense competition from such powerhouses as Westinghouse,

Philips Electronics, GE Electric as well as some smaller firms such as Kopin and Evident.

"All of them are working on using nanoparticles or quantum dots for LED (light-emitting diodes) lighting," said Jack Uldrich, a Minneapolis-based nanotechnology consultant.

Such companies typically have far more resources than does InnovaLight, Uldrich said.

As a result, InnovaLight might need larger partners to help bring its products to market. One Minnesota company that is focusing on nanotechnology, Maplewood-based 3M Co. might end up being a good match for them, Uldrich said.

Aside from Apax Partners, venture capital firms such as ARCH, Sevin Rosen Funds, STARTech Early Ventures and Triton Ventures also funded InnovaLight. That could mean other opportunities for nanotech firms in the Twin Cities, hoping to attract venture capital.

"We will soon have our first board meeting up here; some of our directors may want to plug into other opportunities up here," Thurk said.

"They could attract two or three or up to 10 companies like InnovaLight," he said. "If even one of them works, it would be a big success for the area and could mean thousands of jobs."

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