

# ViaCyte Takes Kyoto Laureate's Work to Next Level

San Diego Business Journal

## VIACYTE

**CEO:** John S. West.

**Financial information:** Not disclosed.

**No. of local employees:** 40.

**Investors:** Privately held, venture capital backed.

**Headquarters:** Torrey Pines, branch in Athens, Ga.

**Year founded:** Founded in 1999 as Novocell Inc., the company merged with CyThera and Bresagen in 2004, and changed its name to ViaCyte in 2010.

**Company description:** ViaCyte is a preclinical therapeutic company focused on diabetes, developing therapies with human embryonic stem cell lines.

A San Diego company that is working to bring to market a treatment for diabetes derived from embryonic stem cells is also working with Kyoto Prize winner Shinya Yamanaka - whose invention of a way to derive stem cells from skin cells has been called "the most important stem cell breakthrough of all time."

"We wanted to work with Dr. Yamanakas cells," said ViaCyte Chief Executive Officer John S. West. "We want to get clinical experience so we can show it works and we can plug this right into effective, safe treatments that people can actually use."

ViaCyte is far down the road in developing a device that uses stem cells to become the essential pancreas cells that treat diabetes by sensing the glucose levels in the blood and then reacting by releasing insulin or glucagon as the two hormones that control the highs and lows of blood sugar are needed.

"We think we are two years away from the first human trial, and that will take a few more years because the first year perhaps 10 or 20 people will try it," West said.

The California Institute for Regenerative Medicine, the state consortium of stem cells researchers created by Proposition 71 in 2004 with \$3 billion in taxpayer dollars, supports ViaCytes work. The institute is its single largest venture capital investor, with \$26.3 million in four grants since 2007. ViaCyte is the biggest corporate recipient of CIRMs money, and is one of just eight for-profit companies

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that have been awarded any of the \$1.9 billion in CIRM grants so far. The bulk of the money has gone to universities, hospitals and nonprofit research institutes including The Scripps Research Institute and the Salk Institute for Biological Studies.

Joe Panetta, president and CEO of Biocom, the trade group representing the life sciences industry in Southern California, said: "ViaCyte is one stellar example of the innovation being developed in Southern California to cure or treat a myriad of diseases, such as diabetes. The company's stem cell technology holds promise for millions of people worldwide, which is why it is one of the very few companies that have received funding from CIRM."

### **Controversy Over Source of Cells**

CIRM arose from the ashes of the Bush administration clamp-down on stem cell research because of the use of human embryos - which remains controversial.

Yamanaka's discovery of a way to turn adult human cells into stem cells was the result of a single-minded determination to eliminate the need to use human embryos to obtain stem cells.

"The first time I saw an embryo, a tiny human, I made up my mind," Yamanaka said.

The stem cells from embryos are so valuable because they are undifferentiated, which means they don't know what to grow into as they split into more and more cells. So putting the genetic code of a defining cell into a stem cell informs the cell what kind of cell to become and to create by multiplying.

Yamanaka took adult skin cells and used a series of effects on them to strip them of their differentiation so they forget they are skin cells and become the base material, a stem cell. Then he began trying to introduce combinations of genes into the stem cells to get them to differentiate.

It was a long, lonely and, at first, unsupported project. But in 2006, he reported that his team was able to get mouse cells to become stem cells.

### **Accidental Discovery**

He came to the discovery by a side trip from his original research in cardiovascular disease during his Ph.D. studies at The J. David Gladstone Institutes in San Francisco. A supervisor gave him a gene that may have links to arteriosclerosis to use in creating "knockout" mice, mice with specific characteristics needed for testing.

"It turned out the gene was important in cancer, not what I was studying," Yamanaka said. "But it was very interesting. I found another gene I thought was important in cancer. It turned out to be important to stem cells."

The cells derived from human skin aren't ready for prime time, Yamanaka said. He points out that he uses a retrovirus that causes cancer - undifferentiated growth - in

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the process of deriving stem cells. And they have to be tested and retested for safety.

But since he isolated them, Yamanaka and his team have changed the protocols for how skin cells become stem cells to get far closer to the flexibility and durability of human embryonic stem cells.

"The cells are not yet up to the embryonic stem cells performance but they will get there," said West of ViaCyte.

Marty Graham is a freelance writer for the San Diego Business Journal.

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