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Wisconsin stem cell industry has been slow in developing

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Madison, Wis. - With the stated goal of capturing 10 percent of the stem cell technology market by 2015, Gov. Jim Doyle used a 2006 visit to the Medical College of Wisconsin to announce an important executive order. It directed the state Department of Commerce to spend at least $5 million to recruit new stem cell companies to Wisconsin.

It's an ambitious goal - perhaps too ambitious, given the lack of traction the state has experienced in advancing that objective. While a handful of stem cell companies are engaged in promising research, the cluster is not very large despite what the state has done to put out the welcome mat.

Among the more prominent stem cell companies, two of them - Cellular Dynamics International and Stem Cell Products - involve Jamie Thomson, the University of Wisconsin-Madison professor that first isolated and cultured human embryonic stem cells.

Another, Stemina Biomarker Discovery, was launched by Beth Donley, former director of the WiCell Research Institute, and UW professor Gabriela Cezar.

CellCura, a Norwegian biotechnology and stem cell research company, last year opened an office in Madison's University Research Park.Cell Line Genetics, led by CSO Lorraine Faxon Meisner, develops products that support embryonic stem cell researchers and companies.

Of these, the only companies that have reported an appreciable number of employees are Cellular Dynamics (20) and Stem Cell Products (7).

A number of developments have undermined the state's efforts to add to their ranks, according to people interviewed for this article.

Limitations on federal funding for embryonic stem cell research is the most often-cited factor.

The challenge to stem cell patents held by the Wisconsin Alumni Research Foundation did not cause WARF licensees to bail, but it may have caused others to question Wisconsin's standing as the "Birthplace of Stem Cell Research," as Doyle touts it.

Some point to perceptions that linger from 2005, when the Legislature passed and Doyle vetoed a bill that would have banned cloning of human embryonic stem cells for research purposes, part of the social controversy that stem cell research has ignited.

Perhaps the biggest barrier is the weight of expectations. “Science moves at its own pace,” noted Tom Still, president of the Wisconsin Technology Council. “Unfortunately, some of the best advances of stem cell research created expectations of things that would happen at the clinic level faster than is realistic.”

Picking up business

Recent events might help Wisconsin pick up the pace. WARF has emerged victorious in its stem cell patent re-examination and, according to Managing Director Carl Gulbrandsen, expects to announce licensing agreements this summer with two large, international companies.

Last fall, Thomson announced a new technique to reprogram adult skin cells to behave like embryonic stem cells. The induced pluripotent technique, which does not require the destruction of embryos, was thought to have ended the social controversy and pave the way for more state and federal funding.

A slowing economy, however, have swelled the state budget deficit, making stem cell allocations less likely in the short term.

Thomson believes federal funding opportunities for induced pluripotent cells are hampered by tight budgets. "The war in Iraq squeezes multiple budgets, including that of NIH (National Institutes of Health)," he said. "I think NIH will do its best to fund this, but they have budget problems of their own."

While there still is work to do on induced pluripotent cell lines, WARF plans to put them in the national stem cell bank at the WiCell Research Institute and make them available to researchers worldwide.

Wisconsin also expects to benefit from hosting the World Stem Cell Summit this September, which will attract researchers and investors to Madison for a first-hand look.

"You're probably going to see more change in the level of business activity," Gulbrandsen predicted.

Wisconsin vs. California

At the time he signed the executive order, Doyle cited competition from states like California. The passage of the Proposition 71 ballot initiative made the state of California the world's largest funder of stem cell research, and it has tried to cherry pick UW-Madison's stem cell researchers, including Thomson.

Thomson, who now operates a research lab as an adjunct professor at the University of California-Santa Barbara in addition to his duties at UW, said earlier this year that Wisconsin must invest $50 million annually to keep pace with California's stem cell investment.

California has committed $6 billion to stem cell research via the Proposition 71, but Gulbrandsen noted the state has to spread that out among several research institutions, and it needs to build more infrastructure, whereas funding here is focused on UW-Madison.

In addition, he noted that California scientists have to clear two regulatory hurdles to commercialize their work - rules imposed by their respective universities, and another set of state rules established as part of Proposition 71.

In contrast, Gulbrandsen said UW-Madison scientists only have to go through the university. "I think we have all the ingredients here to be a research magnet for scientists and show we're a better place to do research than California," he said.

UW-Madison has a committee that reviews potential conflicts of interest, and the degree to which researchers view it as a technology transfer impediment probably depends on how it rules in their individual cases.

One stem cell researcher with no complaints is Bill Murphy, an assistant professor of biomedical engineering whose lab in the UW's Stem Cell and Regenerative Medicine Center is focused on the use of stem cells in bone and tissue regeneration. Murphy has demonstrated proof-of-concept in large animal models for bone regeneration and evidence of tendon regeneration at the juncture of bone and tendon,

and he is interested in commercializing his work.

Murphy, who passed the committee review, believes Wisconsin has a supportive environment for spin-off businesses. "I don't think there is any taboo associated with starting companies, at least I haven't noticed any," he said.

WiCell, which houses 14 of the 21 federally funded stem cell lines, also expects to play a role in the commercialization of stem cell research. New Executive Director Erik Forsberg believes WiCell's support and training of UW stem cell researchers, and the Waisman Clinical Bio-Manufacturing Facility's role in pilot scale manufacturing and clinical trial preparation, also enable technology transfer.

"All the elements of the therapy development process exist within the university," Forsberg said.

Thus far, the California Institute for Regenerative Medicine, established under Proposition 71, has approved 156 research grants totaling $260 million, and another $262 million in funding for new lab facilities is under consideration. Infrastructure funding would leverage additional private funding at 12 institutions, including a $200 million facility at Stanford, which is requesting $50 million from CIRM.

John Simpson, stem cell project director for the California-based Consumer Watchdog (formerly the Foundation for Taxpayer and Consumer Rights), doesn't view Wisconsin and California as being in competition. He noted the two states are sharing Jamie Thomson, whose Santa Barbara lab has requested $4.7 million in facility funding from CIRM, so the two states have opportunities to collaborate.

"I think it's fantastic that he [Thomson] is coming out here," said Simpson, whose organization was involved in the challenge to WARF's stem cell patents.

Simpson also defended California's research environment, saying it does not have an onerous level of review for researchers and that it has established a series of ethical standards that serve as a model for other states.

Biotech pace

Wisconsin has taken several industry-building steps, including a $750 million initiative to develop stem cell research and biotechnology, the centerpiece of which is the construction of the Wisconsin Institutes for Discovery.

In addition to allocating funds to lure stem cell companies and enacting the Act 255 tax credit program to stimulate angel and venture investment, the state has entered into an agreement in which companies conducting research at non-profit and academic institutions in Wisconsin receive a free, non-exclusive research license from WARF.

Doyle also has helped existing companies with state grants or loans. Stemina Biomarker Discovery has received $1 million in state funding, which complements angel investments. Cellular Dynamics landed a $1 million technology development grant and a $1 million technology development loan, and Stem Cell Products received $1 million in state funding for its development of processes to make blood products.

Thomson, the man who started this quest, thinks the stem cell industry will develop at a pace similar to the biotechnology industry.

"I think the time scale would be similar, but I do think in time the Amgens and the Genetechs of this [stem cell] field are going to start taking off," he said. "Then the only question is, `where are they going to take off?'

"Hopefully, they will in this state."

- Steve Clark: Stem cell frontier on display at Promega

- Tom Still: It's no cult: Wisconsin at the center of stem-cell research world
- Patent office upholds remaining WARF stem cell patents
- Thomson: Wisconsin needs $50M annually to counter California's stem cell investment
- UW-Madison, WARF want federal funding for new stem cell technique

Comments

#1

Paul Jones responded 1 year ago:

Two big advantages the California folks have is better access to much larger pools of much more experienced venture capital investors and a much broader and deeper pool of experienced biotech managers. Of the two, the later is probably the biggest advantage, as the smart money usually follows the smart people. From what I have heard, the Wisconsin stem cell community, to the extent it wants to become a home of multiple big players in stem cell commercialization, needs to ask itself why its firms tend to be led more often by academics with little or no proven private sector management experience rather than by industry-proven biotech executives. While there are perhaps some examples of larger biotech firms being led by CEOs who remain active in the academic community, those are the exceptions, and not the rule.