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Md., Calif. sign agreement on stem-cell research

Scientists in 2 states to work together

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Against the backdrop of the 2009 World Stem Cell Summit in Baltimore, Maryland authorities on Monday signed a first-ever bicoastal agreement with the state of California to enable hundreds of scientists funded by agencies in each state to pool their scientific talents and hundreds of millions of dollars in research grants.

"By forging collaborations with California, we can create together intellectual powerhouse teams to accelerate the search for cures and ... therapies for the benefit of people across the country and around the world," said Gov. Martin O'Malley, who witnessed the agreement signed by the Maryland Technology Development Corp. and the California Institute for Regenerative Medicine.

California has the largest program in the world providing funding for stem cell research, with more than \$781 million in grants awarded since 2005.

Maryland's 2006 Stem Cell Research Act has so far funded about \$56 million in grants through the state's Stem Cell Research Fund. Scientists at the University of Maryland School of Medicine and Union Memorial Hospital, for example, are exploring why stem cells seem to speed the healing of weak or broken tendons. Others at UM are probing the suspected existence of cancer stem cells that enable "cured" cancers to recur. And other researchers at Maryland and Johns Hopkins are hoping to put stem cells to work healing victims of combat injuries and other trauma.

The new bicoastal agreement is a first for both states. No Maryland money will be spent in California, and vice versa. But each state hopes the fruits of their scientific collaboration will help scientists in both states leverage even more research money from the National Institutes of Health, the largest source of biomedical research dollars in the world.

"I see this not only as a tremendous advantage to Maryland scientists, but as job generation for Maryland, and part of our way out of the recession," said Dr. Curt Civin, director of the Center for Stem Cell Biology and Regenerative Medicine at the University of Maryland School of Medicine.

Although California has signed similar collaborative agreements with six countries, the pact with Maryland is the first with another state.

O'Malley said Maryland has so far funded 141 stem cell research grants involving 350 researchers, physicians, lab technicians and others. Another 700 researchers have benefited from the grants through their support roles in the projects.

Bio-tech businesses are also benefiting. "We are ... putting a renewed priority on supporting the dreams of emerging bio-entrepreneurs" through "bioinvestor" tax credits and state subsidized technology incubator programs, the governor said.

Maryland, with 2 percent of the nation's population, now hosts about 8 percent of its bio-science industry - about 400 companies employing 26,000 people.

Stem cells are an immature form of living cells that are capable, with the right prodding, of dividing and transforming themselves into almost any body tissue or organ. Medical researchers believe they may hold the key to an almost endless variety of cures and therapies, as well as insights into human development and the origins of diseases such as cancer.

The moral debate

Stem cell research, however, has been haunted and slowed, scientists say, by moral and ethical debates about the use of one type of stem cell, called embryonic stem cells, derived from human embryos.

In 2001, President George W. Bush barred the use of federal funds for embryonic stem cell research, except for research using stem cell lines already in existence.

Civin said those rules "certainly slowed us very much." But now that the Obama administration has lifted the ban and issued new guidelines to prevent misuse of the technology, he said, "now it's our job to catch up, and compete with the rest of the world."

O'Malley spoke at the Baltimore Convention Center, where more than 1,200 scientists, biomedical entrepreneurs and others from 40 states and 34 countries have gathered for the fifth annual World Stem Cell Summit.

Among the recipients of Maryland stem cell grants reporting their work to an international audience this week is Dr. Sergei P. Atamas, an assistant professor and immunologist at the University of Maryland School of Medicine.

With a \$100,000 grant from the Maryland Stem Cell Research Fund last year, he and Dr. Lew C. Schon, an orthopedic surgeon at Union Memorial Hospital in Baltimore, began to study the value of stem cell injections in the healing of damaged or broken tendons in the foot.

The damage and inflammation can result from sports injuries, military injuries, or from chronic illnesses such as diabetes and kidney disease, he said. Sometimes, "the tendons and ligaments become very weak, and ... just snap."

Traditionally, he said, "the treatment is rest, immobilization; you just give it time to heal." Or, in the case of breaks, surgery may be necessary.

Schon decided to investigate whether stem cells could improve the results of those therapies. After isolating and purifying adult stem cells from his patients' bone marrow, he injected it into their damaged tendons.

"The beauty of this is that nothing comes from the outside. They're not embryonic [stem cells], they're not foreign. They're the patients' own tissues," Atamas said.

In a study of more than 250 patients, he said, significant numbers of them "started feeling better quickly, many on Day 3" after surgery, and no longer needed pain relief. "These people can start walking in three to four weeks," he said. Normally that would take six to eight weeks.

Improvement was so swift that Atamas and Schon concluded it was "virtually impossible for bone marrow [stem] cells to have become tendon cells that fast," Atamas said.

Instead, they suspect the cells are producing proteins, or molecules that speed healing. Just which chemicals those might be is the focus of their research under the second year of the Maryland grant.

Tumors' survival cells

Another line of research, one Civin is involved with, seeks to find out whether cancerous tumors may also have a form of stem cells that resist cancer therapies and survive to bring the cancer back.

Although they would be genetically identical to the regular tumor cells, he said, "we think they are also different in non-genetic ways we call epigenetic ... We're trying to target these cancer stem cells. Are they there in every cancer? ... How can we kill them without wiping out normal cells?"

The fact that Maryland and Baltimore were chosen to host this year's World Stem Cell Summit is a boon, both to the region and to the field of stem cell research, said Karen Rotherberg, chairman of the Maryland Stem Cell Research Commission.

All of the state's stem cell grant recipients are required to present their results at the session, she said. So "it really is highlighting the depth and breadth of the science in Maryland."

But it's not all about the science, she said. The summit was also designed to bring together members of the business community, patient advocates, ethicists, lawyers, government regulators and the general public, all of whom are discussing the many sensitive issues that surround the technology.

That the turnout has been good despite the weakened economy says a lot of about the value of such meetings, Rothenberg said. "Nothing can replace people being in a room together, or meeting in a hall talking about the excitement of new science."

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