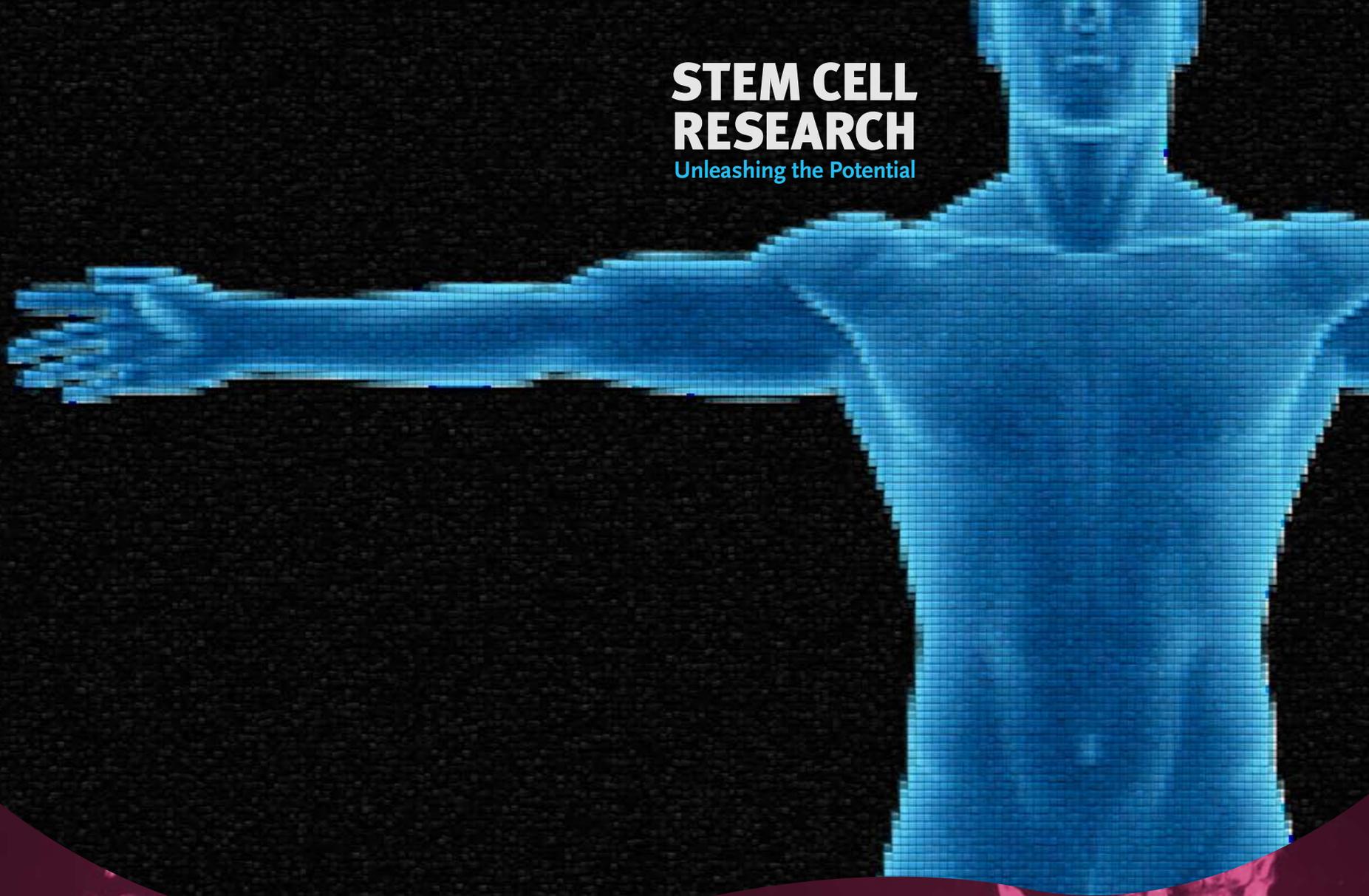


# STEM CELL RESEARCH

Unleashing the Potential

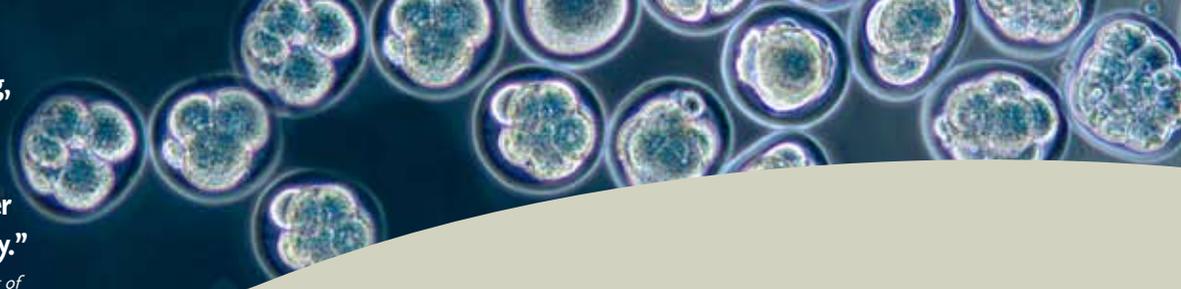


University of  
Connecticut

UNIVERSITY OF CONNECTICUT 2007

“Stem cell research is a hugely complex, yet immensely fascinating, area of research with the potential to unlock the greatest scientific and medical discoveries ever, and UConn is well positioned with a wide range of dedicated scientific teams to continue to be a pioneer in what will be the most important research area of the 21st century.”

—Marc Lalonde, professor and chairman of the Department of Genetics and Developmental Biology of the UConn Health Center



## THE UNIVERSITY OF CONNECTICUT'S REPORT ON STEM CELL RESEARCH

**S**tem cells are the future of healthcare. Their discovery is one of the signal moments in the evolution of medicine, and the race is on to unlock their potential. Scientists are hard at work learning what makes stem cells grow, how to affect their development and, ultimately, how to turn them into therapies to treat a host of diseases.

The word for this research is “urgent.” And nowhere is it more apparent than at the University of Connecticut. When the Connecticut General Assembly boldly authorized public financing of human stem cell research two years ago, UConn was already well established in the field of regenerative medicine which aims to promote natural healing processes to help the body regrow damaged or destroyed tissue to heal previously irreversible injuries.

Stem cells are the very essence of regenerative medicine, and UConn has been making significant investments in both resident expertise and research facilities for more than a decade. With a world renowned reputation, the University was ideally positioned to benefit from the state legislature’s authorization of \$100 million to fund stem cell research over the next ten years, with UConn receiving more than half (\$12 million) when the first cycle of state funding - totalling \$20 million - was disbursed in 2006.

The research supported by those funds ensures that UConn will remain a nationally prominent center in this rapidly evolving field. Equally important for the state’s flagship public university, UConn’s stem cell research can be expected to make a major, long-lasting contribution to our state’s knowledge-based economy.

What follows is a snapshot of the extraordinary work being done at UConn in this exciting field. It’s yet another example of the kind of high-level research that distinguishes the University of Connecticut, and we are eager to share it with the people of Connecticut and those across the country.



#### NERVOUS SYSTEM REPAIR

• Akiko Nishiyama, Associate Professor, Department of Physiology & Neurobiology in the College of Liberal Arts and Sciences, is investigating the possibility of using glial cells generated from human embryonic stem cells to encourage cell regeneration in the brain and nervous system. Some types of glial cells can promote the development of axons, extensions of neurons, the primary cells of the nervous system.



#### BONES REBUILT

• David Rowe, Professor, Genetics & Developmental Biology, and Director of the Center for Regenerative Medicine, UConn Health Center, is leading a multidisciplinary research team to advance understanding of how embryonic stem cells can help rebuild bone, cartilage, skin and muscle tissue. The group working on this \$3.5 million musculoskeletal project aims to introduce cells with reparative abilities into an area needing replacement of damaged or missing tissues. This could range from treatment of isolated defects all the way to regeneration of limbs.



#### BRAIN DISORDER CURES

• To treat degenerative and traumatic brain disorders, embryonic stem cells that develop into neurons must be able to locate themselves in the correct area of the brain. They can't be injected directly to every location where they are needed. Joseph LoTurco, Professor, Department of Physiology & Neurobiology in the College of Liberal Arts and Sciences, is studying the genes that control the migration of stem cell-derived neurons in the brain.





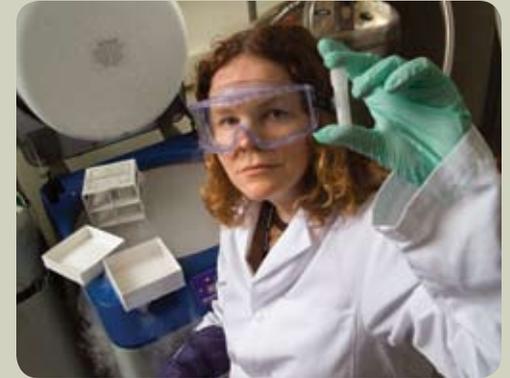
## UCONN – A NATIONAL LEADER

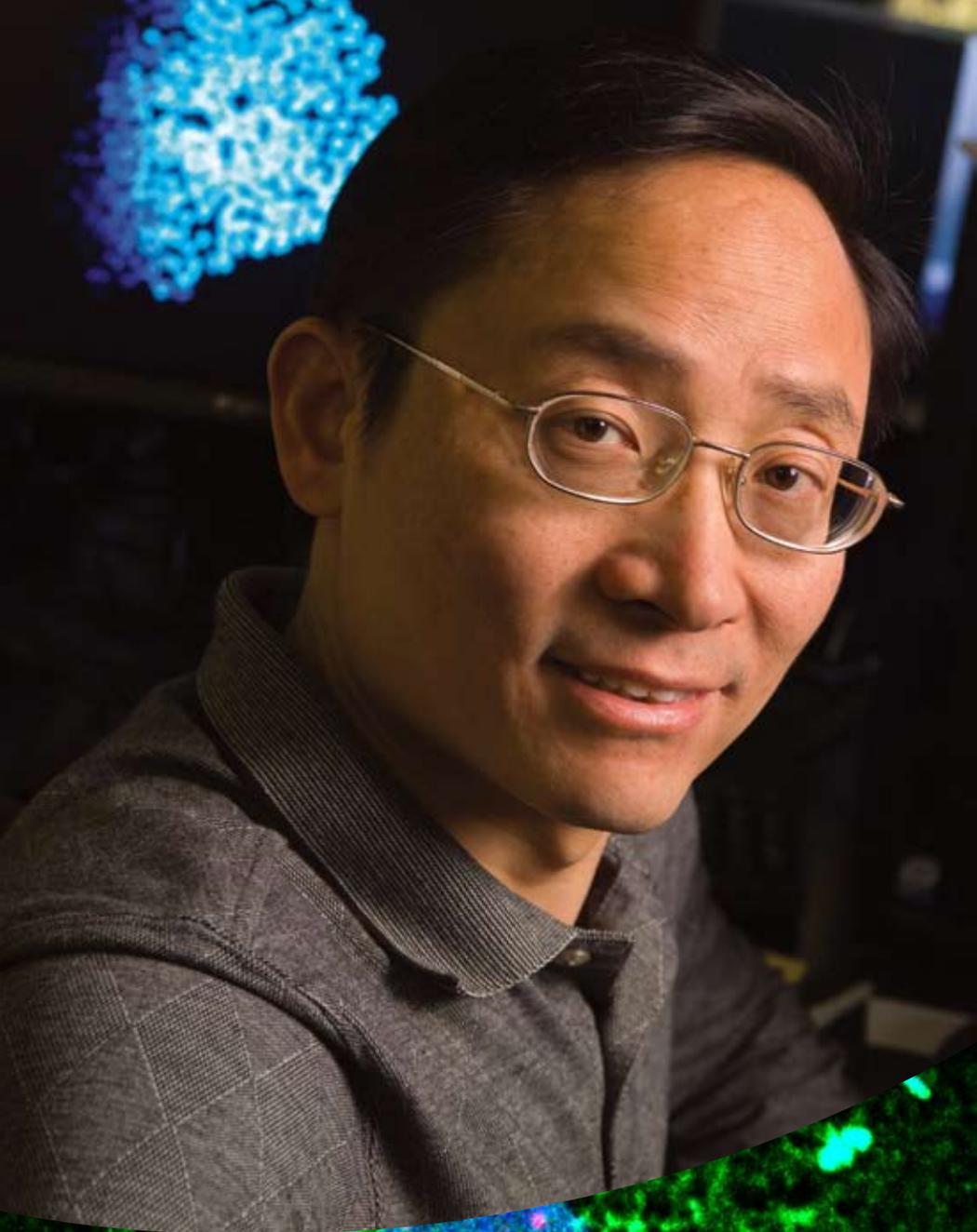
**F**urther distinguishing our commitment to our revolutionary stem cell research program, in 2007 the University acquired a 113,000-square-foot facility that will serve as the home of a new Cell Sciences Institute housing both research laboratories and incubator space for businesses seeking to move research innovations into medical practice.

Uniting UConn scientists in a cross-disciplinary quest to accelerate stem cell discoveries, the institute will also serve as a highly visible symbol of UConn's role as a leader in stem cell research.

The State's historic investment coupled with the work of our acclaimed researchers and institutional investment in this facility have focused national and international attention on the University, reinforcing UConn's richly deserved reputation as New England's top public university.

As an established leader in regenerative medicine and a nationally significant contributor to the growing field of stem cell research, the University's endeavors not only benefit the state economy and the field of healthcare, but also further the education of our students, researchers, clinicians and educators of tomorrow.





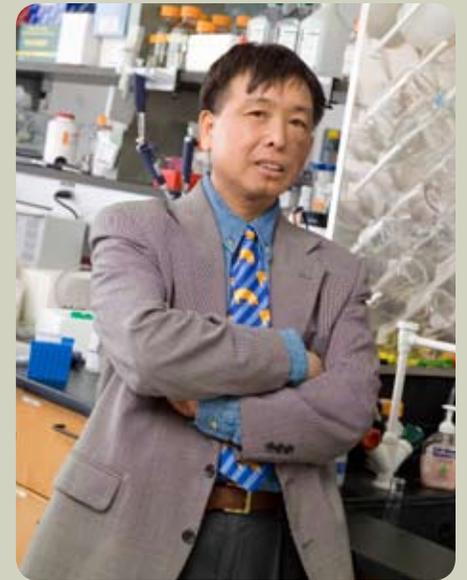
## A LONGSTANDING COMMITMENT

In 1996, Xiangzhong "Jerry" Yang, one of the world's foremost animal biotechnologists, joined UConn as an associate professor of animal science and biotechnology and head of the Biotechnology Center's Transgenic Animal Facility. Spearheaded by Yang, the Center for Regenerative Biology opened in 2001, signaling UConn's commitment to advancing the frontiers of regenerative biology.

Just four years later, UConn launched a 10-year stem cell research program and invested more than \$2 million to attract a team of scientists with hands-on expertise in human

embryonic stem cells. Central to that effort was the recruitment of Ren-He Xu, a renowned expert on growing human embryonic stem cells.

Xu, who established UConn's core laboratory for advanced stem cell research, not only develops the stem cells that will be used in research, but also works closely with the 23 principal UConn investigators who are supported in part by the \$12 million in state funding. Studying stem cells across a spectrum of perspectives, this group comprises a collaborative and highly dynamic cross-campus "team" determined to make stem cell therapies a reality.



## MAGIC SEEDS

The discovery of stem cells is one of medicine's great milestones. Progenitors of all animal tissues, they can mature into any cell type the human body requires for its many specific functions. For that reason, they are sometimes referred to as "magic seeds." Learning to harness them and direct their growth into various specific cell lines offers researchers the potential to cure a host of diseases. That is precisely the goal that UConn scientists are aggressively pursuing today.

UConn is one of only a few universities in the nation growing human embryonic stem cells; one of only two in New England.

## THE HIGHEST ETHICAL STANDARDS

To ensure UConn's stem cell research program is managed to the highest ethical standards, the University has established the Embryonic Stem Cell Research Oversight Committee (ESCRO). Chaired by Anne Hiskes, associate professor of philosophy in the College of Liberal Arts and Sciences, it provides oversight of the complex ethical issues related to the derivation and research use of human stem cell lines at the University's facilities.



The ESCRO comprises faculty from our main campus in Storrs as well as from the UConn Health Center, along with a panel of scientific, ethical and legal experts. It carefully reviews all proposals submitted by the University's investigators for funding from the Connecticut Stem Cell Research Grant Project. While each request must be in compliance with federal, state and local regulations in order to be approved, ESCRO further ensures that UConn stem cell research is carried out according to the highest ethical standards.

