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Stem Cell Research at UCSB Soars with New Lab Space and New Research Teams

Biomedical research at UC Santa Barbara has catapulted to a position of leadership in the arena of stem cell biology, offering progress toward cures for vision diseases such as macular degeneration. Stem cell research has the potential to transform the practice of medicine, by replacing diseased tissue with healthy new cells. Interdisciplinary teams of UCSB researchers -- including world-renowned faculty members recruited from the U.S. and Britain -- are leading the charge. The university's newly renovated lab space is critical to the mission.

This research holds the promise of developing stem cells from skin, called induced pluripotent stem cells, which could eventually replace the use of human embryonic stem cells. The hope is to find cures for diseases including macular degeneration, diabetic retinopathy, and Alzheimer's.

Campus leaders, dignitaries, scientists, and engineers gathered at UCSB on Friday to celebrate the completion of a dream: 10,000 square feet of renovated laboratory space devoted to stem cell research. This was the grand opening ceremony and ribbon-cutting in celebration of UCSB's Center for Stem Cell Biology and Engineering, part of the Neuroscience Research Institute. The California Institute for Regenerative Medicine (CIRM) contributed to the renovation with a \$3.2 million grant that was matched by \$3.2 million from UCSB. The top-flight new laboratories are a magnet for

attracting new talent.

UCSB Chancellor Henry T. Yang commented: "We think UCSB can make important contributions to stem cell research at the interface of biology, neuroscience, and engineering. The future is very bright as we continue to grow and add more top-notch researchers and faculty to this area. These new laboratories will make this possible."

Kenneth S. Kosik, physician and Harriman Chair in the Department of Molecular, Cellular, and Developmental Biology, and co-director of the Neuroscience Research Institute, remarked on this watershed moment in UCSB's stem cell research. "This is a momentous event," said Kosik. "It's a big milestone for UCSB to have come from a premier engineering institute to a place where we are doing world-class work in another entire area, in stem cell biology. With that triumph, that success, we are moving into world-class ranks here."

Leading stem cell biologist Dennis Clegg, center executive director of strategy, planning, and operations, and co-principal director of the California Project to Cure Blindness, has directed the center since its inception, and also directed strategy for UCSB's specific contribution to stem cell biology.

"We realized that we have a tremendous collection of expertise in bioengineering, basic molecular biology, and neuroscience," said Clegg. "Those groups together, working together -- collaborating across normal interdisciplinary lines -- make for a powerful combination of expertise. And we've been able to address some of the key problems in stem cell research, like how to deliver the cells, how to get the cells pure, how to monitor the cells after transplantation, using this combination of bioengineering and molecular biology.

"This has been a long process to complete this renovation for the stem cell center," Clegg said. "It started back in 2007, with our application to CIRM for a major facilities grant. It involved a large number of people on campus -- scientists, design and construction, administrators.

"We spent many hours figuring out how to come up with matching funds and how to raise money for the stem cell center. It really is a realization of our dream to expand stem cell research on campus. We think we have a lot more to offer. The trajectory is upward; we are really making progress. This will allow us to hire new people, new faculty, bring them in and collaborate with the group of stellar scientists that we've already assembled."

One of the new center directors, Peter Coffey, was hired with a CIRM recruitment grant earlier this year. Coffey, who holds The Garland Chair, and is the center's executive director of translation, is considered a star in the world of stem cell science. While at the University College London, he started a group called the London Project to Cure Blindness, which will begin clinical trials early next year. Coffey hopes to bring a part of this project to California.

"To be part of UC Santa Barbara at this time is extremely exciting," said Coffey. "Today we're actually opening the center for stem cell biology and engineering, bringing two components together which are not available anywhere else in the world, engineering and stem cell biology together, to transform and actually speed what is very dear to my heart, which is the translation of science to its clinical use."

Coffey said that it was the people involved in stem cell research at UCSB who drew him to move here. He said that the center has produced "an 'A' team where we can actually accelerate a new type of endeavor of using stem cells as a new type of medicine: regenerative medicine."

Stem cell pioneer James Thomson, center co-director of regenerative biology, and Garland Chair, became the first person to derive human embryonic stem cells in 1998. In 2007, Thomson's group reported the first isolation of induced human pluripotent stem cells contemporaneously with Shinya Yamanaka in Japan. Thomson is also on the faculty of the University of Wisconsin, and director of the Morgridge Institute for Research.

Thomson said of UCSB: "It's a great place; the engineering is superb. Tom Soh has been a close collaborator for about the last six years. Every time I talk with him he has some meaningful idea that we can use with stem cells." Soh is center co-director of technology and engineering, and associate professor of mechanical engineering and materials, and of biomolecular science and engineering.

Pierre Wiltzius, the Susan and Bruce Worster Dean of Science, and professor of physics, spoke about the importance of space at the university. "Space speaks very loudly," said Wiltzius. "This is open lab space with few barriers, where researchers can interact very freely. Those labs have an almost immediate impact in two areas. The first one is recruitment of faculty and scientists. A CIRM leadership award allowed us to recruit Dr. Pete Coffey from London, whose lab is in the renovated space. The new space was absolutely critical."

Wiltzius said the second area of impact that the new space has is its leveraging capability. He referred to the recent gift of \$5 million from philanthropist Bill Bowes, founder of the biotechnology giant Amgen. "What inspired him was the caliber of our world-renowned researchers, scientists, and engineers -- and UCSB's institutional commitment," said Wiltzius.

The grand opening featured a lecture by Mark Humayun, physician, professor of biomedical engineering and cell and neurobiology, and associate director of research at the Doheny Retina Institute at the University of Southern California.

The newly renovated space includes a conference room named for Louise Clark and John Carbon, emeritus professors and groundbreaking biologists at UCSB.

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