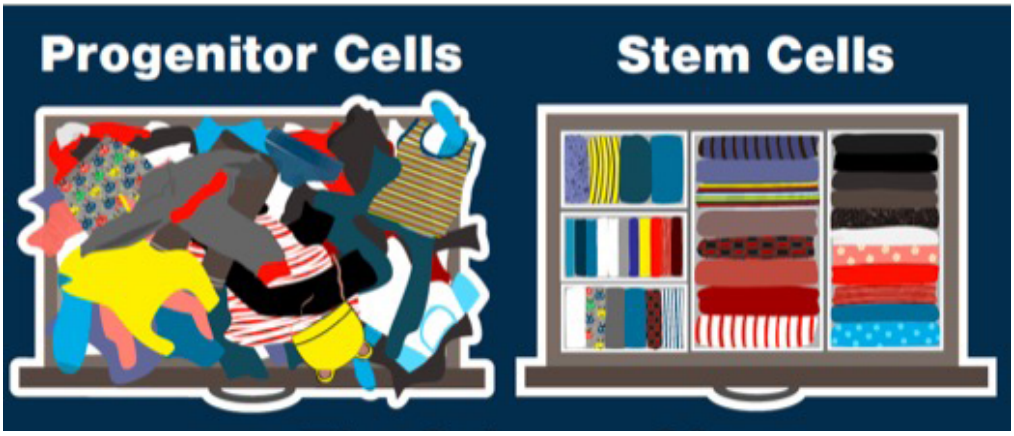
SANFORD REPORT

Monthly Newsletter of Sanford Stem Cell Clinical Center

UC San Diego Health
Sanford Stem Cell Clinical Center

IN THIS ISSUE



Robert Signer, PhD, associate professor of medicine and faulty member of the Sanford Stem Cell Clinical Center, discovered that misfolded proteins may be at the root of many types of degenerative, malignant and age-related diseases. The findings are published in the January 7, 2020 online issue of the journal Cell Reports. [See below]

From left to right: Patty Maysent, MPH, MBA, CEO of UC San Diego Health, Denny Sanford, businessman and philanthropist, and Catriona Jamieson, MD, PhD, director of the Sanford Stem Cell Clinical Center

Message From the Director

Dear Colleagues and Friends of the Sanford Stem Cell Clinical Center,

As we enter a new decade of nucleotide specific technologies, we may welcome gene replacement and single base editing. Enhancements to lentiviral technologies and stem cell expansion have led to new clinical trials supported by Sanford Stem Cell Clinical Center.

Sincerely,
Catriona Jamieson, MD, PhD

Robert Signer, PhD, assistant professor of medicine in the division of regenerative medicine at UC San Diego

The Science of Tidying Up

Dr. Robert Signer's research is supported by the Sanford Stem Cell Clinical Center.

Throughout life, blood forming stem cells in bone marrow regenerate all of our blood and immune cells. Defects in blood forming stem cells can lead to diverse blood disorders, including anemia, bone marrow failure, immune deficiencies and cancer. Recently, Robert Signer, PhD, assistant professor of medicine in the division of regenerative medicine, and colleagues discovered that stem cells make new proteins slower than other types of blood cells. Subsequently, this slow rate of protein production is crucial for normal stem cell function. New research from the Signer Laboratory reveals that stem cells produce protein slowly in order to prevent errors during protein assembly. Erroneous protein production can lead to the biogenesis of misfolded, dysfunctional and potentially toxic proteins.
Read more

Qingfei (Fay Jiang, PhD, assistant professor of medicine in the division of regenerative medicine at UC San Diego

Meet Our Newest Faculty Member: Fay Jiang, PhD

Dr. Fay Jiang's laboratory is located at the Sanford Consortium for Regenerative Medicine.

The Division of Regenerative Medicine is pleased to announce Qingfei (Fay) Jiang, PhD, as assistant professor of medicine at UC San Diego School of Medicine. Dr. Jiang's current research focuses on women's and children's health.

Her team investigates the functions of DNA and RNA modifications that take place during immune regulation when host cells respond to viral infection.
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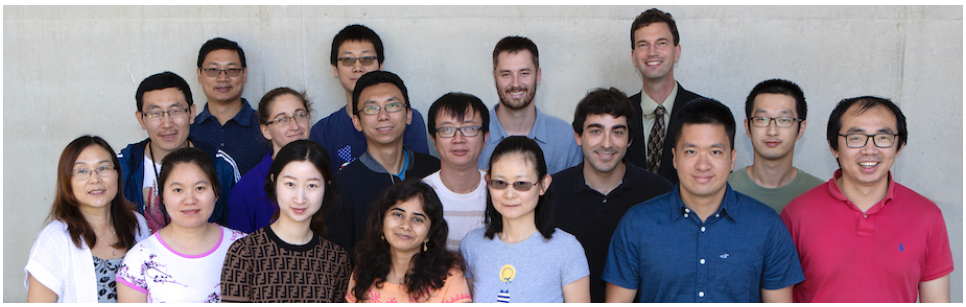

The second study, published in Cell Stem Cell, was led by Jeremy Rich, MD professor of medicine at UC San Diego and Sanford Center faculty member. Knowing that many viruses use integrins for entry into human cells, Rich's team (pictured above) inhibited each integrin with a different antibody to see which would have the greatest effect.

Zika Virus' Key into Brain Tumor Cell Identification, Leveraged to Block Infection and Kill Cancer Cells

By Heather Buschman, PhD | January 16, 2020

Dr. Jeremy Rich is the director of the Sanford Center Brain Tumor Institute.

Zika virus infection can stunt neonatal brain development, a condition known as microcephaly, in which babies are born with abnormally small brains. To determine how best to prevent and treat the viral infection, scientists first need to understand how the pathogen gets inside brain cells.

Employing different approaches to answer different questions, two research teams at University of California San Diego School of Medicine independently identified the same molecule — αvβ5 integrin —as Zika virus' key to entering brain stem cells. In a pair of papers published January 16, 2020 by Cell Press, the researchers also found ways to take advantage of the integrin to both block Zika virus from infecting cells and turn it into something good: a way to shrink brain cancer stem cells. Read more

Injection of Virus-Delivered Gene Silencer Blocks ALS Degeneration, Saves Motor Function

Novel spinal therapy/delivery approach prevented disease onset in neurodegenerative ALS disease model in adult mice and blocked progression in animals already showing disease symptoms

By Scott LaFee | December 23, 2019

Martin Marsala, MD, Professor in the Department of Anesthesiology and Director of the Sanford Surgical Training Center

Dr. Martin Marsala is the director of the Sanford Surgical Training Center.

Writing in Nature Medicine, an international team headed by researchers at University of California San Diego School of Medicine describe a new way to effectively deliver a gene-silencing vector to adult amyotrophic lateral sclerosis (ALS) mice, resulting in long-term suppression of the degenerative motor neuron disorder if treatment vector is delivered prior to disease onset, and blockage of disease progression in adult animals if treatment is initiated when symptoms have already appeared.

The findings are published in the December 23, 2019 online issue of the journal Nature Medicine. Martin Marsala, MD, professor in the Department of Anesthesiology at UC San Diego School of Medicine and a member of the Sanford Consortium for Regenerative Medicine, is senior author of the study. Read more

Meet Our Newest Faculty Member: Fay Jiang, PhD

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They are trying to understand the cross-talk between immune microenvironment and infection-induced inflammation signaling involved in the transformation of normal tissue stem cells to cancer stem cells.

Microbial infections can lead to disturbance of stem cells and progenitors that result in chronic inflammation, stem cell aging, and in some cases, cancer.
For instance, ovarian cancer is considered the most lethal gynecological malignancies due to delayed detection and multidrug resistance. It is still unclear what causes ovarian cancer and there are no effective diagnostic biomarkers. Several studies have suggested that viral infection such as human papillomavirus (HPV) or cytomegalovirus (CMV) are risk factors for epithelial ovarian cancer.

Her goal is to advance our understanding of how to better protect our stem cells against viral challenges and to provide better therapeutic strategies for ovarian cancer and other malignancies.

UPCOMING

February 20, 2020 - The 16th Industry/Academia "Next Generation Precision Oncology" Symposium at the Moores Cancer Center

February 25-27, 2020 - Catriona Jamieson, MD, PhD will be presenting "Pathway to Fedratinib's Approval; Patients Lives Depended on It" at Biocom's 10th Annual Global Life Science Partnering Conference at the Lodge at Torrey Pines

March 12-13, 2020 - The Sanford Stem Cell Symposium at the Sanford Consortium for Regenerative Medicine Duane Roth Auditorium