STEM CELL SOCIETY
SINGAPORE

Singapore
Stem Cell Consortium
A★STAR

STEM CELL CLUB

Wednesday 17 March 2010 • Aspiration Theatrette, Matrix Building Level 2M,
30 Biopolis Street, Singapore 138671

PROGRAMME

5.30 - 6.30pm

Bruce R. Conklin, MD
Senior Investigator, Gladstone Institute of Cardiovascular Disease
Professor of Medical Genetics, University of California, San Francisco

"Stem Cells, Pharmacology and Cardiovascular Diagnostics"

6.30pm

Network Social
Provided by Singapore Stem Cell Society

Only for members of Stem Cell Society Singapore ; Non-members who wish to attend Network Social could sign up for membership at the seminar

Hosted by

Dr Alan Colman
Executive Director, Singapore Stem Cell Consortium

SPEAKER   Bruce R. Conklin, MD

Stem Cells, Pharmacology and Cardiovascular Diagnostics

Abstract

Our primary research focus is to use human induced pluripotent stem (iPS) cells as a model system for understanding how biological signals orchestrate the development of complex tissues and then modulate essential functions such as heart contraction. Our long-term goal is to discover new drugs to produce healthy tissues for regenerative medicine, as well making drugs safer by understanding how some drugs cause side effects such as lethal cardiac arrhythmias. We have taken a synthetic biology approach to decoding the basic signaling responses of a family of receptors called G protein–coupled receptors (GPCRs), that are the target of nearly half of the world's pharmaceuticals. We have engineered GPCRs called receptors activated by small synthetic ligands (RASSLs) that are unresponsive to endogenous natural hormones, but can still be activated by synthetic small-molecule drugs. We have expressed RASSLs in a wide variety of tissues to control responses such as heart rate, bone formation, and stem cell development (see figure). We have produced iPS cells from patients with human genetic disorders in heart rhythm, such as long QT syndrome. These studies will allow us to directly examine the role of GPCR signaling in iPS–derived human tissues with specific human genetic diseases.

In parallel research efforts, our pathway-oriented bioinformatics team has produced a series of free, publicly distributed software packages called GenMAPP and WikiPathways, which are used by hundreds of researchers worldwide. We are expanding these open source programs in partnership with Alitora Systems, a leading bioinformatics company. These software tools allow us to better analyze functional genomic data to advance our own studies of GPCR signaling in developing tissues.

Biography

Bruce R. Conklin, M.D. utilizes receptor engineering, and stem cell biology to understand basic pharmacological responses, with a particular emphasis on the largest known family of receptors for hormones and drugs, called G protein–coupled receptors (GPCRs). Dr. Conklin received an A.B. degree in public health from the University of California, Berkeley in 1982. He completed an MD degree at Case Western Reserve University in Cleveland in 1988. During his last two years of medical school, Dr. Conklin had the privilege of working under the tutelage of Nobel Laureate Julius Axelrod, Ph.D., at the National Institutes of Health. He then completed his residency at Johns Hopkins Hospital and a postdoctoral fellowship in the laboratory of Henry Bourne, M.D. at UCSF. From 1995 to 2001, Dr. Conklin was the Associate Director of the General Clinical Research Center at San Francisco General Hospital. He is a member of several honorary societies including the American Society for Clinical Investigation. Dr. Conklin is the founder of several public genomics projects including BayGenomics, GenMAPP and WikiPathways. Dr. Conklin is on the advisor board of Cytoscape, ShrinkNano, and iPerian Inc. Dr. Conklin was the founding director of the Gladstone Genomics Core and the Gladstone Stem Cell Core. Dr. Conklin is the Associate Director of the Gladstone CIRM Scholars Training Program, and is the principle investigator on multiple stem cell related grants from NIH and the CIRM.