THE Flexner DISCOVERY LECTURE SERIES

Upcoming Discovery Lecture:

SUZZANE BAKKEN, RN, D.N.SC.
Columbia University

December 11, 2014
208 Light Hall / 4:00 P.M.

THE Flexner DISCOVERY LECTURE SERIES

GEORGE Q. DALEY, M.D., Ph.D.

CELLNET: ENHANCING CELLULAR
ENGINEERING THROUGH NETWORK BIOLOGY

OCTOBER 30, 2014
4:00 P.M.
208 LIGHT HALL

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THE VANDERBILT MEDICAL SCIENTIST TRAINING PROGRAM

VANDERBILT UNIVERSITY
MEDICAL CENTER

CELLNET: ENHANCING CELLULAR ENGINEERING THROUGH NETWORK BIOLOGY

Somatic cell reprogramming, directed differentiation of pluripotent stem cells, and direct conversions between differentiated cell lineages represent powerful approaches to engineering cell identity for applications in research and regenerative medicine. I will describe CellNet, a network biology platform developed to assess the fidelity of cellular engineering and to generate specific hypotheses for improving cell derivations. Analyzing published accounts, we have confirmed that reprogramming to pluripotency is remarkably robust, and found that cells derived via directed differentiation more closely resemble their in vivo counterparts than products of direct conversion, as reflected by the establishment of target cell type gene regulatory networks. We have applied CellNet to two cell fate conversion paradigms: conversion of B cells to macrophages and fibroblasts to hepatocyte-like cells, and learned provocative new lessons about the nature of these engineered cells. CellNet analysis, iteratively coupled to experimental validation, provides a rational strategy to enhance cellular the derivation of target cells for research and therapy.

GEORGE Q. DALEY, M.D., Ph.D.

SAMUEL E. LUX IV PROFESSOR OF HEMATOLOGY/ONCOLOGY

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Dr. Daley received his bachelor's degree magna cum laude from Harvard University (1982), a Ph.D. in biology from MIT (1989), and the M.D. from Harvard Medical School summa cum laude (1991). He has served the International Society for Stem Cell Research (ISSCR) as past-President ('07-'08), led the special task forces that produced the ISSCR Guidelines for Stem Cell Research (2006) and Clinical Translation (2008), and is currently the ISSCR Clerk. Dr. Daley has been elected to the Institute of Medicine of the National Academies, American Society for Clinical Investigation, American Association of Physicians, American Pediatric Societies, American Academy of Arts and Sciences, and American Association for the Advancement of Science, and has received the NIH Director's Pioneer Award, the Judson Daland Prize from the American Philosophical Society, the E. Mead Johnson Award from the American Pediatric Society, and the E. Donnall Thomas Prize from the American Society for Hematology. Dr. Daley's research exploits mouse and human disease models to identify mechanisms that underlie cancer and blood disease.