Institute of Molecular and Cell Biology

A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Prof. Vinay Tergaonkar:

Date: 19 October 2018, Friday
Time: 4:00PM – 5:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: A/Prof. Dirk Hockemeyer, Department of Molecular and Cell Biology, University of California, Berkeley, CA, USA

Title: Using human genetically engineered human pluripotent stem cells to elucidate the molecular principles of TERT transcriptional regulation

While telomerase function is essential for the long-term survival of dividing stem cells, transcriptional silencing of the TERT gene is the primary mechanism that restricts telomeraseactivity in somatic cells leading to telomere shorteningand replicative senescence. We hypothesized that cis-regulatory elements in the TERT promoter are essential for the expression of TERT in stem cells and are necessary for the transcriptional silencing of telomerase upon differentiation. We have used a genetic approach to map these TERT cis-regulatory elements by engineering human pluripotent stem cells (hPSCs) to carry definedhomozygous deletions in theendogenous TERT promoter. In these hPSC lines we have analyze TERT expression and telomerase levels. This analysis has – at single base resolution – identified the genetic elements, that are required for the expression of TERT in hPSCs. Subsequently, we have differentiated these cells to map cis-elements that are required to efficiently silence TERT in somatic cells. Using this approach, wehave identified the molecular signatures of TERT silencing upon differentiation and started to shed light on the molecular mechanisms that dictate to TERT repression.