



## *BMC-GPMLS: Distinguished lecture series*

# **Professor Richard A. Young**

Whitehead Institute for Biomedical Research and Department of Biology,  
MIT, Cambridge, MA, USA



## **Title: „Development and disease: the view from chromosome neighborhoods“**

The control of cell identity is orchestrated by transcriptional and chromatin regulators in the context of specific chromosome structures. We have identified enhancers, insulators and 3D chromatin interactions in various human cells and used this data to reconstruct and compare the 3D regulatory landscapes of these cells. In normal healthy cells, there are shared and development stage-specific regulatory landscapes of topological domains and their subdomains. The topological domains consist of nested CTCF-CTCF loops that form insulated neighborhoods and, within these, enhancer-promoter loops that are necessary for normal gene control. Key features of these structures and their functions will be discussed. Cancer-associated somatic mutations frequently impact insulated neighborhood loop anchors, and these alterations are often responsible for oncogene activation in tumor cells. These results reveal important roles for the 3D regulatory landscape in the control of cell state in health and disease.

**Time: Monday, June 27<sup>th</sup>, 16:00-17:00**

**Location: DeCODE building,**