

Colloquium

Landscapes in Stem Cell Biology

Gautam I Menon

IMSc, Chennai

A fundamental concept that underlies much of how we think about stem cells and their differentiation is that of an "epigenetic landscape". Such ideas were pioneered in prescient work by Conrad Waddington about 80 years ago, much before landscape pictures began to be discussed in other contexts. (The idea of "complex energy landscapes" enters all current discussions of complex systems, whether we talk of spin glasses, of structural glasses, of protein folding or even of satisfiability in computer science.) Despite the foundational importance of the epigenetic landscape, we know little about what defines such a landscape and what variables we might think of measuring to understand it. I will describe some biophysical work that addresses this problem, connecting it to the puzzling observation of auxetic mechanical behaviour of the stem cell nucleus in the transitional state. Linking experimental observations with biophysical theory suggests one possible way of reconstructing epigenetic landscapes in a single parameter. I will explain this somewhat novel point of view.

Friday, Sep 14th 2018

11:00 AM (Tea/Coffee at 10:30 AM)

Auditorium, TIFR-H