

Title: Translation switches underlying stem cell function and regeneration

Abstract

Regeneration is a complex process controlled by highly coordinated spatio-temporal regulation of gene expression. One aspect of gene regulation involves translation control, which is required for precise protein synthesis. My laboratory studies translational regulatory mechanism underlying stem cell function and regeneration. We use planarian *Schmidteamediterranea* and mammalian embryonic stem cells as a model system to study stem cell biology and regeneration. Planaria because of their robust regeneration capabilities emerged as a tractable model system to understand mechanisms that drive regeneration. We identified several translation regulators in the stem cells of planaria and demonstrated their important role in regulating stem cell function. The talk will highlight the critical role of polyadenylation and their binding partners in stem cell fate decisions. I will also briefly describe our collaborative work on the role of tRNA derived small RNAs (tsRNAs), in stem cell fate transition in mouse embryonic stem cells. Using proteome and high throughput sequencing techniques we have identified mechanistic role of tsRNA in regulating stem cell state transitions. Together, my talk will highlight the importance of translation regulation critical for stem cell function and regeneration.