

'Discovery of a novel form of developmental protein JARID2 and its implications to diseases'

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Venue: Charaka

Talk Abstract:

Stem cells have two distinctive abilities – the ability to differentiate into diverse cell-types and the ability to proliferate indefinitely. In cancers, a small population of “cancer stem cells” (CSCs) exploit these characteristics to drive cancer maintenance, growth and propagation. These cells are often refractory to treatment and cause relapse and metastasis. Therefore, molecules that regulate the balance between cell division and differentiation in stem cells are important in understanding and treating cancer.

JARID2 is an essential developmental protein and a co-factor of chromatin modifying Polycomb Repressive Complex-2 (PRC2). The main function of JARID2 is to regulate transcription during cell proliferation and differentiation. And yet, we do not entirely understand how JARID2 can regulate these two rather opposing cellular processes. We have made an exciting discovery that, during ES cell and keratinocyte differentiation, JARID2 switches from being a transcriptional repressor to a transcriptional activator of differentiation genes (Al-raawi et al., under revision), by adopting a low molecular weight form, ?N-JARID2. Unlike JARID2, ?N-JARID2 cannot interact with the repressive PRC2 complex. Our hypothesis is that together, JARID2 and ?N-JARID2, help in striking a balance between the processes of cell proliferation and differentiation that is crucial for normal cellular function. Changes in the levels of the two forms will propel cells along the path of either differentiation or proliferation and will have implications to diseases like cancer.