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# Seminar

# Control Mechanisms In Quiescent Cells: Implications for Stem Cell Function

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Adult stem cells mostly exist in a quiescent state (G0), persist within tissues and contribute to their regeneration. Earlier characterized as hibernation, characterized by absence of DNA synthesis and basal rates of RNA & protein synthesis, G0 is now emerging as a balanced or poised state where both the cell cycle and tissue-specific programs are held in check by active mechanisms. Our approach to understanding quiescence is by contrast to another non-proliferative state i.e. terminal differentiation, where developmentally committed programs drive a distinct, tissue-specific state, using skeletal muscle cells as a model. We find that in the quiescent progenitor state but not in the differentiated state, despite global repression, the basal activity of many genes is not silenced but is maintained by chromatin regulation, supporting the hypothesis that the 'repressed' quiescent genome is poised for activation. We have used both genome-wide analyses and specific perturbations to investigate the quiescence-specific program. The data supports the emerging picture of a fine balance of control mechanisms at multiple levels including chromatin poising, polymerase stalling and extrinsic signaling to transcription factors.

***Thursday, Nov 5th 2015***

***4:00 PM (Tea/Coffee at 3:45 PM)***

***Seminar Hall, TCIS***