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Selected Publication

Cheung TH, Quach NL, Charville GW, Liu L, Park, L, Edalati A, Yoo B, Hoang P, Rando TA. (2012) Maintenance of muscle stem cell quiescence by microRNA-489. *Nature* 482:524-528.

Research Aims and Interests

The main areas of interest of the Cheung laboratory at HKUST are muscle stem cell biology and muscle stem cell aging. The focus of the laboratory is to specify the molecular pathways that control stem cell quiescence and stem cell-mediated tissue regeneration to achieve a better understanding of adult stem cell function in the context of tissue regeneration, disease and aging. In particular, we are interested in understanding the emerging concept that stem cell quiescence is a poised state awaiting proper signal for activation. Our current data have indicated that the quiescent state is actively regulated at the post-transcriptional level. Notably, we found that quiescent muscle stem cells spontaneously exited the quiescent state and became activated and proliferated upon the removal of components regulating the miRNA pathway. We are currently interested to understand microRNAs that function to maintain the state of quiescence and its associated targets.

Our laboratory is also interested in understanding how stem cells divide asymmetrically. We have previously shown that muscle stem cells possess asymmetric template strand segregation. Our laboratory is interested in further understanding how the template strand, or the immortal strand, can be asymmetrically segregated during stem cell division. Together, we aim to investigate the molecular regulation of adult stem cells, which will be important for understanding the basis for disease, and designing better treatment and prevention programs.