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A microRNA-638/ferritin gene: Pseudogene network regulates iron storage in prostate cancer

Yvonne Tay
National University of Singapore, Singapore

MicroRNAs (miRNAs) are small, non-coding RNAs that post-transcriptionally modulate gene expression by binding to miRNA response elements (MREs) on target transcripts. Aberrant expression of miRNAs results in the deregulation of tumor suppressors and/or oncogenes. Iron is an essential metal known to play critical roles in various cellular processes. Deregulated iron homeostasis tilts the systemic iron balance, leading to various human pathologies, including cancer. However, little is known about miRNAs in the regulation of iron storage. In this study, we characterize miRNA-638 as a crucial player in iron storage in prostate cancer, which is the second leading cause of cancer death in men worldwide. MiRNA-638 targets ferritin heavy chain, FTH1 and several of its pseudogenes to promote tumor growth, suggesting the potential involvement of a deregulated competing endogenous RNA (ceRNA) network in pathogenesis. Our results indicate that miRNA-638 could be an oncomiRNA in prostate cancer; hence it is a potential therapeutic target.

Biography

Yvonne Tay has received her PhD in 2008 from the National University of Singapore and Genome Institute of Singapore (GIS). Her PhD work, which was supported by an A*STAR Graduate Scholarship led to seminal contributions to our understanding of the mechanisms of microRNA function. She was awarded the 2009 Philip Yeo Prize for Outstanding Achievement in Research by A*STAR in recognition of these breakthrough discoveries. After a two year Postdoctoral stint at A*STAR, she subsequently received a Special Fellow award from the Leukemia Lymphoma Society to continue her Postdoctoral training at Harvard Medical School and Beth Israel Deaconess Medical Center. Her postdoctoral research in the Pandolfi Lab led to the discovery that protein-coding transcripts can co-regulate the tumor suppressor PTEN by competing for shared microRNAs. She has recently commenced her new appointments as an Assistant Professor in the Department of Biochemistry and Junior Principal Investigator at the Cancer Science Institute of the National University of Singapore in September 2014.

yvonnetay@nus.edu.sg

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