Cancer Science Institute of Singapore

SEMINAR ANNOUNCEMENT

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RNA-binding activity of Suv39h1 chromodomain is coupled with its H3K9 methylation recognition in assembling heterochromatin

Date: Tuesday, 3 Jan 2017
Time: 4pm – 5pm
Venue: LT35, CeTM (MD6) (14 Medical Drive, S117599)
Host: A/Prof Motomi Osato

Abstract:

SUV39H is the major histone H3 lysine 9 (H3K9)-specific methyltransferase that targets the pericentric regions and is crucial for assembling silent heterochromatin. SUV39H recognizes trimethylated H3K9 (H3K9me3) via its chromodomain (CD), and this recognition allows SUV39H to target specific chromosomal regions. However, the detailed targeting mechanisms, especially for naïve chromatin without preexisting H3K9me3, are poorly understood. Here we show that Suv39h1's CD (Suv39h1-CD) binds nucleic acids, and that this binding is important for its function in heterochromatin assembly. Suv39h1-CD had higher binding affinity for single-stranded RNA than double-stranded DNA, and its ability to bind nucleic acids was independent of its H3K9me3 recognition. Suv39h1 bound major satellite RNAs in vivo, and mutational studies demonstrated that both the nucleic acid-binding and H3K9me-binding activities of Suv39h1-CD were crucial for its pericentric heterochromatin assembly. These results suggest that chromatin-bound RNAs may be involved in creating SUV39H's target specificity.