
Seminar Title	: Role of Pseudouridine(Ψ)-RBP Interactions in Regulation of Energy Metabolism
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Abstract	<p>: RNA undergoes numerous kinds of chemical modifications that regulate their functions. Pseudouridine(Ψ), is a type of RNA modification, has been shown to increase the stability of secondary structures and affect translation efficacy in mRNA. It is also important for mRNA localization and regulation of gene expression. Site-specific Pseudouridylation is found to be directly affecting RNA splicing. The presence of conserved pseudouridine at RBP binding sites indicates their interaction with the RBPs. Ψ can form an extra H bond at N1 position and has the ability to bind to all the nucleotides of RNA i.e., A, U & G. Due to this character, introducing pseudouridine alters the binding of RBPs toward specific RNA sites. Researchers found Ψ locations in mRNAs. However, which RBPs interact with Ψ and their function in are poorly studied. We constructed network of Ψ containing mRNA and binding RBPs and analysed the network properties, important nodes, clusters and communities, and functional analysis of RBPs. Our findings revealed possible role of Ψ in regulation of transcription, translation, glucose metabolism, energy metabolism and stress response. Role of Ψ in energy metabolism led us to focus on Ψ in mitochondrial mRNAs and binding RBPs. To further explore we examined alterations caused by Ψ in mitochondrial mRNA-RBP interaction profile. We found Ψ shows a complex specific effect. It has the ability to interact directly with RBPs via H bond, hydrophobic interaction and salt bridge. Indirectly Ψ has the ability to alter the existing H bond length and bond strength. We also observed modulation in π cation and π stacking interactions. We will also check whether the Ψ-RBP or Ψ-RBPs complex has any significant role in the regulation of ETS in mitochondria. Till now, our study found significant binding of RBPs on Ψ location in the mitochondrial mRNAs. The functions of those RBPs are mainly related to the regulation of RNA processing, RNA stability, transport, and protein synthesis, energy metabolism and glucose metabolism. Complex specific effect of Ψ in alteration of interaction profile.</p> <p>Keywords: Pseudouridine, RNA Binding Protein (RBP), Electron Transport System (ETS), In vitro transcription (IVT), Encyclopedia of DNA Elements (ENCODE), enhanced crosslinking and immunoprecipitation (eCLIP), Network Analysis, Functional enrichment, Molecular Docking</p>
