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Sin Nombre Hantavirus Nucleoprotein (N) interaction with Ribosomal protein S19 (RPS19)

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Hantaviruses are the causative agents of hemorrhagic fever with renal syndrome (HFRS) and hantavirus cardio-pulmonary syndrome (HCPS) in humans. Hantaviruses, *Bunyaviridae* family members, are tripartite negative strand RNA viruses. The three segments of genome, L, M and S encode RNA dependent RNA polymerase (RdRp), glycoproteins (G1 & G2) and nucleocapsid (N) protein, respectively. Nucleocapsid protein (N) plays diverse roles during hantavirus infection. Primarily, N protein is involved in the encapsidation and packaging of viral genome. Hantavirus N protein helps in the preferential translation of viral mRNAs by specifically binding to the 5'UTR of viral mRNAs and recruiting translation initiation machinery. N protein also binds 5' Cap and facilitates translation initiation by acting as eIF4F surrogate. We have recently found that N protein interacts with 40S ribosomal subunit via ribosomal protein S19 (RPS19). Using deletion mutagenesis approach, we identified RPS19 binding domain at the N terminus of N. Further, fusing RPS19 binding domain with GFP was sufficient to pull down RPS19 protein. N-mutant deficient in RPS19 binding didn't augment reporter mRNA translation both *in vivo* as well as *in vitro*. Upon the inhibition of cap dependent translation, the mutant didn't support the translation of reporter mRNA (GFP) as the wt-N did. On characterizing the mutant, it was observed that no other known functions of N protein were compromised, like any major structural change, trimerization, viral RNA panhandle and mRNA cap binding. Our studies revealed another new target (N protein and RPS19 interaction) that can be subjected to therapeutic intervention for hantavirus infection.

Biography

Safder is a PhD candidate of Microbiology at the University of Kansas Medical Center Kansas City, USA. He has obtained his masters degree in Biotechnology from the University of Kashmir, India. His work is much focused on replication, transcription and protein translation of different viruses like hantavirus and parvovirus. He has published several papers in various reputed journals.

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