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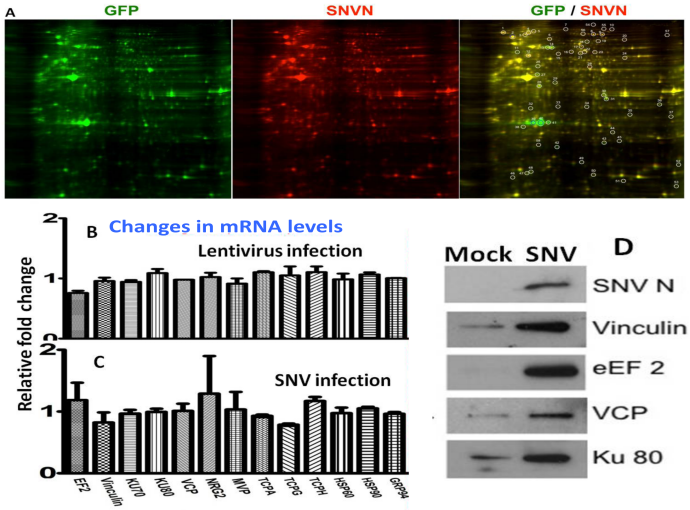
Title: Hantavirus N protein regulates the host gene expression at translational level

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Abstract:

Hantavirus nucleocapsid protein (N protein) binds to the mRNA 5' cap and ribosomal protein S19 (RPS19), a structural component of the 40S ribosomal subunit. In addition, a trimeric N-protein molecule specifically binds to a highly conserved triplet repeat sequence (UAGUAGUAG) of the viral mRNA 5' UTR. N-protein associated ribosomes are loaded on viral mRNA 5' UTR to boost the translation of viral transcripts in the host cell cytoplasm where cellular transcripts are competing for the same translation machinery. Using 2D-DIGE and mass spec analysis, we found that N-protein mediated translation strategy also favors the translation of certain host cell factors that likely play a role in virus replication. Our preliminary data shows that mRNA encoding the host factors are preferentially translated by N protein with the assistance of 5' UTR. A detailed bioinformatics analysis will identify the cellular pathways regulated by the N protein mediated translation mechanism. These studies will reveal new targets for therapeutic intervention of hantavirus disease.

Image



hantavirus N protein were examined by 2D-DIGE analysis B and C Real time PCR analysis to examine the changes in the mRNA level encoding the host factors of interest in either transfected cells (B) o virus infected cells (C). D: Changes in the protein expression levels o certain host factor

Recent Publications

1. Mir MA and panganiban AT (2008) A protein that replaces the entire cellular eIF4F complex, **EMBO J**. 19294-9
2. Cheng E, et al and Mir, MA (2010). Characterization of the interaction between N protein and ribosomal protein S 19. **JBC**, 11814-24
3. Ganaie, SS et al and Mir, MA (2010). Ribosomal protein S19 binding domain provides insights into hantavirus N protein mediated translation mechanism. **Biochemical J**, 109-21
4. Salim NN, et al and Mir MA (2016). Targeting a novel RNA-protein interaction for therapeutic intervention of hantavirus disease, **JBC**, 24701



Biography

Dr. Mir is an Associate professor in virology as Western University of Health Sciences, California, USA. He did his PhD in Biophysics and Structural Biology from Saha Institute of Nuclear Physics, India in 2002. He then joined University of New Mexico, USA, as post doctoral fellow in Virology. During his post doc, Dr. Mir worked on the molecular mechanism of hantavirus replication with a special focus on hantavirus N protein. Mir joined the Kansas University Medical Center in 2009 as Assistant Professor in virology. He then moved to Western University of Health Sciences, California, in 2015 as Associate Professor . Dr. Mir's lab studies the molecular cross talk between viral and host factors with aim to identify host factors for therapeutic intervention of viral diseases. His research program is focused on the negative strand RNA viruses from the *Bunyaviridae* family.

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Notes/Comments: