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Structural and RNA binding domain analysis between HIV type 1 clade B and clade C Tat protein: Possible role in clade specific pathogenesis

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HIV-1 clade B and C Tat proteins differentially modulate expression of neuropathogenic molecules. Therefore, we analyzed in silico structural and RNA binding domain variance between HIV-1 clade B and C Tat protein to elucidate their differential roles in clade specific pathogenesis. Our analysis reveals amino acid variations in HIV-1 clade B and C tat protein, which may significantly alter viral transcription and gene expression. Variation in number of hydrogen bonds, helices and turns observed in HIV-1 clade B tat protein than HIV-1 clade C lead to structural stability and better role in HIV/AIDS progression. For the first time we have shown significantly higher RNA-binding domains in HIV-1 clade B compared to HIV-1 clade C, suggesting an efficient role in clade-specific pathogenesis. Our analysis exhibited the presence of a novel conserved CTL epitope in Tat protein specific to HIV-1 clade C from India and USA, which may be potent in peptide/DNA based cross-clade rational vaccine design and diagnostics. Collectively, our study reveal that due to variance in the structural and RNA binding domains of the Tat protein between HIV-1 clade B and C, it may have plausible role in differential clade-specific pathogenesis. Our results may facilitate development of therapeutics and preventive strategies imparting clue for pathogenesis.

Biography

Dr Shailendra Saxena is a Medical Microbiologist at Centre for Cellular and Molecular Biology (CCMB) in India. He has a wide-ranging experience in infectious diseases research and previously worked with World Health Organization, United Nations, and University of Arizona, USA. His group is internationally recognized for its research on RNA viruses. His several papers have been published in various high impact factor journals with high citation in various peer-reviewed journals, prestigious books and monographs. He has received many awards and honors including the Fogarty International Center, NIH (USA) MERIT Award, and named as "Global Leader in Science" by The Scientist magazine (USA) and "International Opinion Leader / Expert" involved in the vaccination for JE by IPIC (UK).