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IISER Bhopal identifies circular RNA that plays crucial role in HIV-1 virus replication

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Team identifies a specific circular RNA encoded by the cells infected by HIV-1



Researchers from the Indian Institute of Science Education and Research Bhopal (IISER Bhopal) identified a specific circular RNA (circRNA) called ‘ciTRAN’, which plays a crucial role in multiplication of the AIDS-causing HIV-1 virus within the human body.

Led by Dr Ajit Chande from Department of Biological Sciences, IISER Bhopal, this research shows how ciTRAN helps the process of copying genetic information from the virus, essentially helping the virus multiply more efficiently.

The researchers developed a novel approach called ‘circDR-Seq’, to successfully capture circRNAs from T-cells (white blood cells) infected with the HIV-1 virus and identified a specific circRNA named ciTRAN, which plays an important role in the multiplication of the virus.

Dr Ajit Chande, the lead researcher said, "Our results indicate that HIV-1 virus hijacks this host-encoded ciTRAN in such a way that it can use it to multiply efficiently. This discovery uncovers a previously unknown aspect of how viruses like HIV-1 overcome transmission barriers.”

Another important result from this research was that the researchers developed a small protein molecule that can inhibit viral transcription, in the context of virally-induced ciTRAN. By showing how ciTRAN promotes the virus's ability to multiply efficiently, this study offers promising avenues for the development of novel therapeutic interventions.

Moreover, the creation of a molecule capable of inhibiting viral transcription represents a significant leap in our understanding of combating HIV-1 and potentially other viruses.