

Researchers identify drug targets for the dreaded Nipah virus

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New Delhi, December 13: Taking the fight against the dreaded Nipha disease to a new level, researchers at Pune-based Indian Institute of Science Education and Research (IISER) have developed drug targets for the virus that causes the disease, using the molecular modeling approach.

Nipah virus outbreaks have very high mortality rates. They are over 70 per cent in Southeast Asia. The virus spreads via bodily secretions of bats, pigs and infected individuals. It was first detected in human population in 1998 in Malaysia, It made its way into Indian subcontinent with outbreaks in Bangladesh and India a few years later.

The Nipah virus is an RNA virus. In other words, its genetic material is RNA surrounded by a protein envelope. Like all viruses, it makes copies of itself and propagates by invading and hijacking the machinery of the host cell, destroying it in the process. The virus' protein envelope is made of six proteins, and its RNA produces three more proteins to defend itself from the responses of the host cells.

The researchers considered all the nine proteins as potential therapeutic targets. They used the genetic sequence of a strain of the Nipah virus from Malaysia and constructed computer models of the protein structures. They then used the models to design molecules that could interfere with the molecular mechanisms of the viral proteins to kill or at least disable it.

They also compared the genetic sequences of 15 strains of viruses from across Bangladesh, Malaysia and India and found that those parts of the proteins that would directly interact with the drug molecules were not effectively different across the strains.

The researchers have put out various details of their work including the structures of the molecules on the website of their Institute for use by other researchers to take up further studies.

“Our strategy was to tackle the development of therapeutics on a proteome wide scale and the lead compounds identified could be attractive starting points for drug development”, the researchers noted in the paper they have published on their work in the journal *PLoS Neglected Tropical Diseases*. The study was funded by Wellcome Trust-DBT India Alliance, Department of Science and Technology (DST) and Council of Scientific and Industrial Research (CSIR).

The research team consisted of Neeladri Sen, Tejashree Rajaram Kanitkar, Ankit Animesh Roy, Neelesh Soni, Kaustubh Amritkar, Shreyas Supekar, Sanjana Nair, Gulzar Singh and M.S.Madhusudhan.