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Singapore develops gene editing technology to fight RNA viruses

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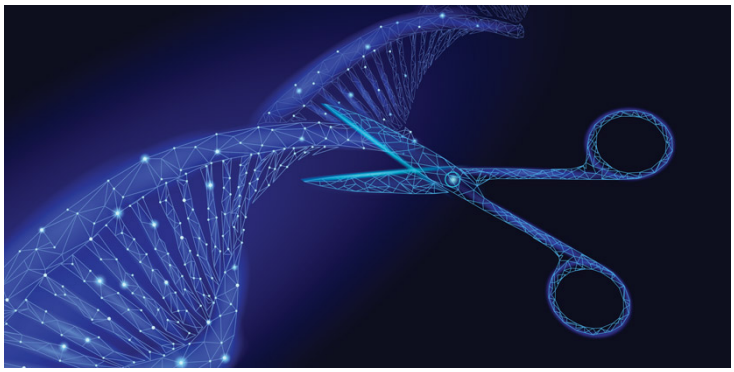
An important development which can potentially treat many diseases caused by RNA viruses



A team of scientists from A*STAR's Genome Institute of Singapore (GIS) and the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine) has made an important breakthrough in the fight against RNA viruses that cause human diseases and pandemics.

Their research shows that the CRISPR-Cas13 editor delivered by adeno-associated virus (AAV) can directly target and eliminate RNA viruses in laboratory models. AAV are delivery vehicles derived from small viruses that naturally infect humans. They are clinically approved for use in gene therapy drugs which are used to treat diseases such as spinal muscular atrophy, Duchenne muscular dystrophy, and haemophilia.

The EV-A71 virus is the cause of the hand, foot, and mouth disease, and in severe cases, can lead to nervous system disease and death. To treat the viral infection, the team turned to CRISPR-Cas13, an RNA-editing technology that alters RNA in a cell. CRISPR-Cas13 edits RNA and opens therapeutic avenues to a wide range of diseases that are untreatable by the Nobel Prize-winning CRISPR-Cas9, which edits DNA.

The latest research findings show that the AAV-CRISPR-Cas13 therapy clears the EV-A71 infection and prevents organ damage and mortality. These findings demonstrate a therapeutic development pipeline for antiviral AAVCRISPR-Cas13 against potentially deadly RNA virus infections. Further therapeutic development could bring this technology towards treating human RNA viruses in the clinic.