

Human Parvovirus Replication and Vector Delivery in Airway Epithelia

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Human bocavirus 1 (HBoV1) is a human parvovirus that possess single-stranded (ss)DNA genomes of ~5.5 kilobases in length. HBoV1 is an autonomously replicating parvovirus and a human pathogen that causes lower respiratory tract infections in young children. HBoV1 can replicate in well-differentiated human airway epithelia and induces a DNA damage response (DDR), which in turn plays a critical role for viral DNA replication. It uses Y-family Translesion DNA synthesis (TLS) DNA polymerase for genome replication. HBoV1 expresses a bocaviral small noncoding RNA (sncRNA)—BocaSR of 140 nucleotides. BocaSR is N6-methyladenosine (m6A) modified and plays an important role in viral DNA replication through interaction with viral genome and the TLS DNA polymerases. Since HBoV1 shows high tropism to human airways, we utilize the HBoV1 capsid to pseudotype a recombinant adeno-associated virus 2 (rAAV2) genome to develop a chimeric rAAV2/HBV1 vector that can carry a cystic fibrosis transmembrane conductance regulator (CFTR) gene of 4.5 kb and correct the defects of CFTR mutations in CF airway epithelia.

Bell Hall 143

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Remote: <https://utep-edu.zoom.us/j/82901391798>