Claims

1. An adenovirus having a capsid comprising:

a hexon protein of SAdV-31, having amino acids 1 to 954 of SEQ ID NO: 42;

a penton protein of SAdV-31, having amino acids 1 to 589 of SEQ ID NO: 37; and

a fiber protein of SAdV-31, haying amino acids 1 to 596 of SEQ ID NO: 51;

said capsid encapsidating a heterologous molecule comprising 5' and 3' adenovirus cis-elements necessary for replication and encapsidation and carrying a gene operably linked to expression control sequences which direct transcription, translation, and/or expression thereof in a host cell.

2. The adenovirus according to claim 1, wherein said adenovirus lacks all or a part of the E1 gene and is replication defective.

3. The adenovirus according to claim 1 or claim 2, wherein said heterologous molecule encodes an immunogen from hepatitis A virus, hepatitis B virus, hepatitis C virus, influenza virus, measles, rubulavirus, Rubella virus, rotavirus, Corynebacterium diphtheria, varicellovirus, pneumococci, staphylococci, or streptococci.

4. The adenovirus according to any one of claims 1 to 3, wherein said heterologous molecule encodes the low density lipoprotein (LDL) receptor, factor VIII, factor IX, or ornithine transcarbamylase.

5. A composition comprising a virus according to any of claims 1 to 4 in a pharmaceutically acceptable carrier.

6. The composition according to claim 5, further comprising an adjuvant.

7. The composition according to claim 6, wherein said adjuvant comprises a liposome, alum, monophosphoryl lipid A, a cytokine, an interleukin, a chemokine, or a ligand.

8. The composition according to claim 5, wherein said composition is formulated for intramuscular, intradermal or intranasal administration.

9. An adenovirus according to any one of claims 1 to 4 for use in delivering a molecule to a target cell.

10. An adenovirus according to any one of claims 1 to 4, for use in a method of treatment.