



ICTV Virus Taxonomy Profile: *Adenoviridae* 2022

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Abstract

The family *Adenoviridae* includes non-enveloped viruses with linear dsDNA genomes of 25–48 kb and medium-sized icosahedral capsids. Adenoviruses have been discovered in vertebrates from fish to humans. The family is divided into six genera, each of which is more common in certain animal groups. The outcome of infection may vary from subclinical to lethal disease. This is a summary of the ICTV Report on the family *Adenoviridae*, which is available at ictp.global/report/adenoviridae.

Table 1. Characteristics of members of the family *Adenoviridae*

Example:	human adenovirus 5 (AC_000008), species <i>Human mastadenovirus C</i> , genus <i>Mastadenovirus</i>
Virion	Non-enveloped icosahedral capsid 90 nm in diameter
Genome	Linear, dsDNA of 25–48 kb with inverted terminal repeats
Replication	Nuclear
Translation	From capped, polyadenylated and often spliced transcripts
Host range	Mammals, birds, reptiles, amphibians and fish; host range varies among virus genera
Taxonomy	Realm <i>Varidnaviria</i> , kingdom <i>Bamfordvirae</i> , phylum <i>Preplasmiviricota</i> , class <i>Tectiliviricetes</i> , order <i>Rowavirales</i> ; 6 genera containing >85 species

VIRION

Adenovirus virions are non-enveloped, pseudo $T=25$ icosahedral particles. The capsid consists of 240 non-vertex (hexon) and 12 vertex capsomers (penton). The latter consist of the penton base and a protruding fiber protein trimer (Table 1, Fig. 1) [1, 2]. The minor, cementing proteins show genus-specific variation but LH3 (atadenoviruses) and protein IX (mastadenoviruses) share a capsid-binding motif [3].

GENOME

The genome is a single linear molecule of dsDNA of 24 630–48 395 bp [4, 5] with inverted terminal repeats of 26–721 bp (Fig. 2).

A virus-encoded terminal protein is covalently linked to the 5'-end of each DNA strand.

REPLICATION

Entry of virus into cells occurs by attachment of the fiber trimer knob to cellular receptors followed by internalization involving interaction between the penton base and cellular α_v integrins [6]. After uncoating, the virus core is delivered to the nucleus, the site of virus RNA transcription, DNA replication and assembly. Infection results in the arrest of synthesis of host DNA, mRNA and proteins. Transcription by host RNA polymerase II involves both DNA strands of the virus genome. Primary transcripts are capped and polyadenylated. Complex splicing patterns govern the

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Abbreviations: DBP, DNA-binding protein; E, early region; ITR, inverted terminal repeat; p, precursor protein; pol, DNA polymerase; TP, terminal protein; UXP, U-exon protein; VA, virus-associated RNA.

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