Adenoviruses (members of the family Adenoviridae) are medium-sized (90–100 nm), non-enveloped viruses with an icosahedral nucleocapsid containing a dsDNA genome. Their name derives from their initial isolation from human adenoids in 1953. Adenoviruses are also known to cause respiratory infections in horses, cattle, pigs, sheep, and goats. Adenoviruses have a broad range of vertebrate hosts; there are 57 accepted human adenovirus types (HAdV-1 to 57) in seven species (Human adenovirus A to G; Genus Mastadenovirus (including all human adenoviruses); type species: Human adenovirus C) have been found to cause a wide range of illnesses, from mild respiratory infections in young children to life-threatening multi-organ disease in people with a weakened immune system. Adenoviruses are endemic in all populations throughout the year. The adenovirus infection is the most frequently caused viral disease of the respiratory tract among preschool children (types 1 - 5 and 7). Adenovirus infections cause approximately 15,000 illnesses per year in basic Army trainees. In the past, US military recruits were vaccinated against two serotypes of adenoviruses, with a corresponding decrease in illnesses caused by those serotypes. FDA has approved Teva Phram Adenovirus type 4 and 7 live oral vaccines in 2011. The new adenovirus vaccine tablets offer protection against two strains of the virus, type 4 and type 7, and is administered in tablet form containing the live virus (32,000 TCID).

The serologic tests are particularly important because they document actual infection in the patient and can be applied to large-scale epidemiologic investigations. The CF and ELISA tests measure predominantly the antibodies directed against the group-specific determinants on the hexon component. The type-specific antigenic determinants of adenoviruses are located at the fibers on the capsid. Because of the ubiquity of the adenoviruses and numerous cross-reactions between related serotypes, seroconversion involving a fourfold or greater rise in antibody infection is necessary to document infection.

Adenoviruses have long been a popular viral vector for gene therapy due to their ability to affect both replicating and non-replicating cells, accommodate large transgenes, and code for proteins without integrating into the host cell genome. Replication-deficient human adenovirus type 5 (Ad5) can be produced to high titers in complementing cell lines, such as PER.C6, and is widely used as a vaccine and gene therapy vector. However, preexisting immunity (neutralizing antibodies, NA) against Ad5 hampers consistency of gene transfer, immunological responses, and vector-mediated toxicities. Strategies to bypass NA to Ad5 viruses include switching of adenovirus type and use of animal adenoviruses. Of the 47 types tested, subgroup B viruses Ad35 and Ad11 proved rarely neutralized by human sera.

About ADI ELISA Kits: ADI has developed adenovirus (Ad5/Hx) antibody ELISA kits to determine the efficacy of various existing vaccines and test new vaccines. Antibody ELISA kits for species or subtypes not listed can also be provided. The kits can be used to assess the basal immunity or vaccine induced antibodies to Ad5/Hx.