

Application Note

Size distribution analysis of recombinant adenovirus using the CPS Disc Centrifuge

Recombinant adenovirus is one of the primary vectors for human gene therapy. However, the aggregation of unstable virus has been a recurring problem during the production of purified virus for human therapeutics. To facilitate the development of a robust manufacturing process for recombinant adenovirus vectors, a convenient and reliable size distribution analytical assay is necessary and we demonstrate here that disc centrifuge sedimentation is applicable to this purpose. Using the CPS Disc Centrifuge system we can provide particle size distribution of adenovirus samples within 15 min. The CPS Disc Centrifuge can detect virus concentrations down to 0.01% (w/v) or 3×10^{11} particles per ml. The apparent hydrodynamic diameter of recombinant adenovirus was determined to be about 0.079 μm . Furthermore, the disc centrifuge analysis was able to detect adenovirus dimers, trimers, and tetramers, consistent with a rigid sphere approximation for adenovirus, as well as a large aggregate of 0.65 μm . The appearance of viral aggregates is confirmed by increased light scattering based on A320/A260 ratios. The technique could be useful for monitoring the kinetics of aggregation for adenovirus and other DNA and RNA viruses in the submicron region. Therefore the CPS Disc Centrifuge can be a critical tool for purification development of viral vectors for meeting therapeutic and research needs.

