Millipore®
Preparation, Separation,
Filtration & Monitoring Products

Product Overview

Ultrafiltration/Diafiltration (UF/DF) of Adeno-Associated Viruses (AAV)

With Pellicon® Capsules and Pellicon® XL 50 Cassettes

Adeno-associated virus (AAV) is one of the most common viral vectors used for gene therapies, often preferred for its safety and scalability. In downstream manufacturing of AAV, tangential flow filtration (TFF) is an essential operation—usually performed at two steps in the process (**Figure 1**)—that provides concentration, buffer exchange, and impurity reduction via ultrafiltration/diafiltration (UF/DF).

Filters that are reliable and provide process predictability help accelerate the path from development to commercialization. Part of the linearly scalable Pellicon® family of TFF filters, single-use Pellicon® Capsules and scale-down Pellicon® XL 50 cassettes provide reliability and reproducibility at any stage of your AAV process, from development to manufacturing.

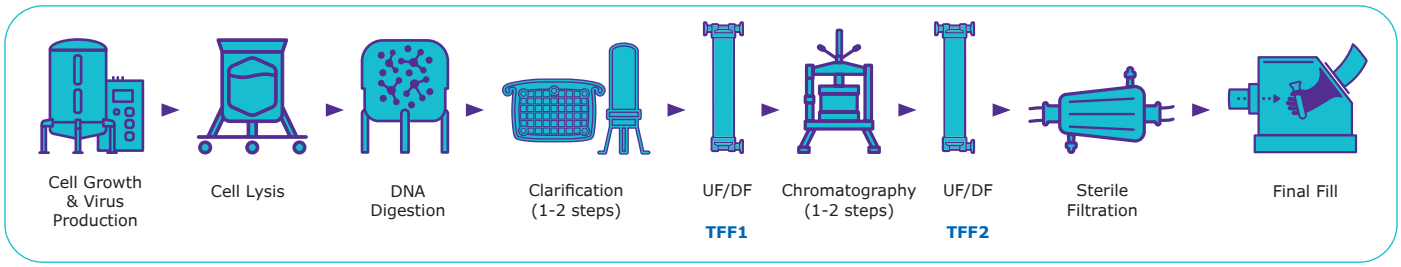

Figure 1. Typical adeno-associated virus (AAV) manufacturing process flow.

Case Study: TFF of Clarified AAV2

Materials and Methods

Scalability performance of Pellicon® Capsule and Pellicon® XL 50 cassette with 300 kDa Ultracel® membrane was evaluated using an in-house AAV2 feed that was detergent-lysed, treated with 100 U/mL of Benzonase® endonuclease and then clarified using Millistak+® HC Pro depth filter with D0SP media and sterile-filtered with Millipore Express® SHC 0.5/0.2 µm cartridge. The feed stream for Pellicon® XL 50 cassette was generated in a shake flask, while a bioreactor generated the feed for Pellicon® Capsule and resulted in a 3.6-fold higher AAV2 titer. The TFF process consisted of a 4× concentration step (UF1), followed by diafiltration (DF) with 5 diavolumes (DV) of HEPES buffer, and a final 2.5× concentration (UF2) to achieve total 10× concentration. A permeate-control TFF process (with permeate pump) was performed with flux for each filter controlled to 50% of its critical flux for UF1, and then 25% for DF and UF2. Membrane loading was 60 L/m^2 and crossflow rate was 5 L/min/m^2 (LMM).

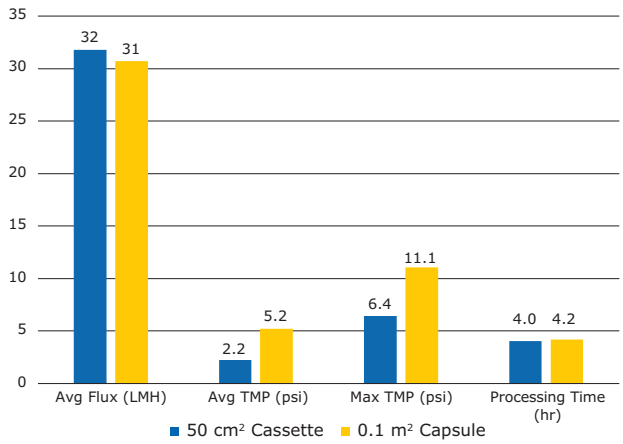

Figure 2. Flux, TMP and process time comparison.

Results

Permeate flux for both capsule and cassette were similar and hence, processing time (**Figure 2**). Average and maximum transmembrane pressure (TMP) were slightly higher for the capsule compared to the scale-down cassette due to differences in AAV2 titer. AAV2 yield and impurity removal were similar between the 0.1 m^2 Pellicon® Capsule and Pellicon® XL 50 cassette (**Figure 3**). The results demonstrate that the Pellicon® XL 50 cassette is an excellent scaling tool for Pellicon® Capsule able to predict performance at scale-up.

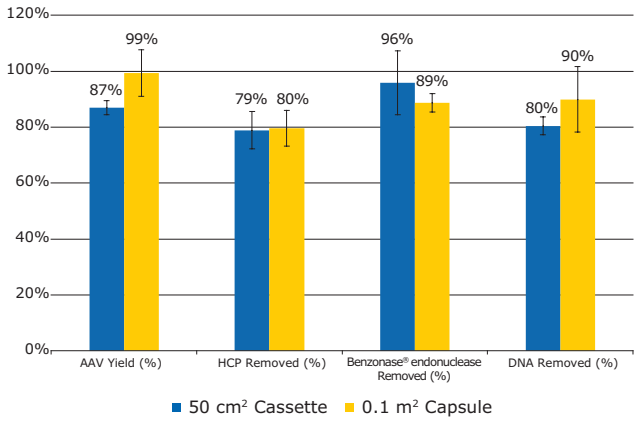

Figure 3. AAV2 yield and impurity reduction levels comparison.

To place an order or receive technical assistance

In Europe, please call Customer Service:
France: 0825 045 645
Germany: 069 86798021
Italy: 848 845 645
Spain: 901 516 645 Option 1
Switzerland: 0848 645 645
United Kingdom: 0870 900 4645

For other countries across Europe, please call: +44 (0) 115 943 0840
Or visit: **MerckMillipore.com/offices**
For Technical Service visit: **MerckMillipore.com/techservice**

MerckMillipore.com

Merck KGaA
Frankfurter Strasse 250
64293 Darmstadt, Germany

We have built a unique collection of life science brands with unrivalled experience in supporting your scientific advancements.

Millipore® Sigma-Aldrich® Supelco® Milli-Q® SAFC® BioReliance®

MK_OT11666EN Ver. 1.0
45025
12/2022