

Data Sheet

Fast-Trap™

Lentivirus and Adenovirus Purification and Concentration Kits

The Fast-Trap™ Adenovirus and Lentivirus Virus Purification and Concentration Kits are efficient tools for virus preparation. They use EMD Millipore's innovative, vacuum-driven Steriflip® device containing a special membrane to purify crude virus samples, followed by a concentration step using an Amicon® Ultra spin filter. **Fast-Trap™ kits will give you high recoveries of purified virus in less time using a simple protocol.**

Highly purified viruses are essential for applications such as vaccine production and genetic modification of cells. Conventional virus purification methods based on sucrose or cesium chloride gradient ultracentrifugation are time-consuming, difficult, and require expensive instrumentation. Likewise, most membrane-based purification methods involve messy and potentially hazardous steps.



These protocols can also be hampered by low virus recovery. **EMD Millipore's Fast-Trap™ virus purification kits solve the problems of traditional methods.**

Fast-Trap™ Advantages

Fast-Trap™ Purification

- Saves time—protocol can be completed in less than two hours
- High yield—recover up to 70% of viral particles
- Dependable—simple protocol ensures quality results
- Easy—Steriflip® filters streamline purification steps and eliminate the need for expensive equipment
- Safe—uses a closed vacuum device to eliminate potential spill

Traditional Purification

- Slow—traditional methods can take up to two days
- Low yield—less than 50% recovery
- Not reproducible—variable results
- Difficult—labor intensive and requires specialized laboratory equipment

Lentivirus / Adenovirus Preparation and Harvest ▶ Benzonase Nuclease Enzyme Treatment (Optional)

▼
Fast-Trap™ Lentivirus and Adenovirus Purification & Concentration Kit

Step 1



Clarification

- Virus sample vacuum filtered on 0.45 µm Steriflip®-HV filter unit

Step 2



Virus Purification

- Pre-treatment of Fast-Trap™ Virus Purification filter unit with equilibration buffer
- Binding buffer added to the clarified virus sample and vacuum-filtered
- Wash buffer applied and vacuum-filtered
- Bound virus eluted with elution buffer

Step 3



Concentration & Buffer Exchange

- Eluted virus sample + exchange buffer applied to Amicon® Ultra-4 50K (Adenovirus)/100K (Lentivirus) device and centrifuged (repeated once)
- Concentrated virus ready for use in non-sterile applications

Step 4



Sterilization (Optional)

- Concentrated virus applied to EMD Millipore Sterile 0.2 µm GV Ultrafree® MC filter unit (#UFC30GV0S) and centrifuged
- The filter-sterilized concentrated virus is ready for use in sterile applications

Figure 1.

Virus purification workflow using the Fast-Trap™ Adenovirus (Cat. No. FTAV00003) and Lentivirus (Cat. No.FTLV00003) Purification and Concentration Kits.

Purity

Crude Adenovirus and Lentivirus samples, both purified with EMD Millipore's Fast-Trap™ kit, were assessed for overall purity by SDS-PAGE stained with Coomassie Blue and Sypro® Ruby dye respectively. As shown in figures 2 and 3, the majority of the contaminating proteins from host cells and cell culture media/serum do not bind to the membrane and pass directly into the filtrate (lane 2).

Wash fractions (lane 3) indicate the wash buffer is removing remaining weakly bound proteins from the membrane. Elution fractions (lane 4) which represents the purified virus, are containing the adenoviral and lentiviral proteins respectively free from contaminating proteins.

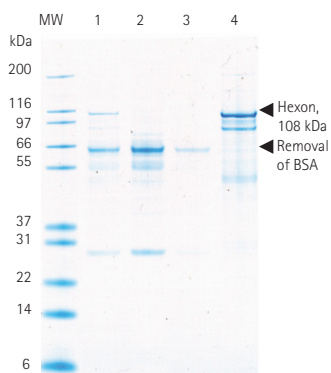


Figure 2.

SDS-PAGE stained with Coomassie Blue.

Equal protein amounts (1.3 µg) of crude clarified adenovirus (lane 1), flow-through fraction (lane 2), wash fraction (lane 3) and eluate fraction (lane 4) of the Fast-Trap™ Adenovirus Purification device were loaded on a SDS gel and stained with Coomassie Blue. Adenoviral hexon protein was enriched and BSA was absent in the eluate fraction.

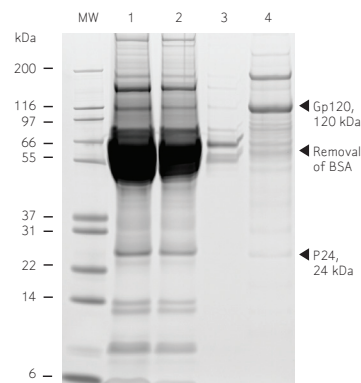


Figure 3.

SDS PAGE with Sypro Ruby staining.

Analysis of equal volumes of crude clarified lentivirus (lane 1), flow-through fraction (lane 2), wash fraction (lane 3) and eluate (lane 4) from the Fast-Trap™ Lentivirus Purification. Lentiviral Gp120 and p24 were detectable in the eluate and BSA was absent.

Higher Recovery

The Fast-Trap™ kits, when compared with traditional cesium chloride and sucrose gradient purification methods, demonstrate a significant increase in viral recovery.

Table 1.

Virus purification results using Fast-Trap™ Virus Purification and Concentration Kit and double CsCl gradient ultracentrifugation.

	Fast-Trap™ Adenovirus Purification and Concentration kit	Traditional Virus Purification
% Adenovirus Recovery	70	45
	Fast-Trap™ Lentivirus Purification and Concentration kit	Sucrose Gradient Ultracentrifugation
% Lentivirus Recovery	47	22

Faster

EMD Millipore's Fast-Trap™ Adenovirus Kit was compared with other common methods to determine which methods gave the best recoveries in the least time. The Fast-Trap™ kit was faster than the other methods while giving similar recovery.

Table 2.

A device from each kit was challenged with 2.06×10^9 infectious viral particles (3 mL crude adenovirus) following the protocol provided with each kit. Total processing time was measured from the time clarification began to the time the final elution ended.

Kit	Format	Total Processing Time	Comments
EMD Millipore Fast-Trap™ Kit	Vacuum	21 min	EMD Millipore Fast-Trap™ Virus Purification and Concentration Kits are fast, safe, easy and dependable
S	Syringe filter	40 min	Flow rate difficult to control, left with "messy" impression due to occasional drop of liquid when changing syringe filters
V	Centrifugal	1 h 20 min (40 min if no clogging)	Clarification device clogged
Traditional CsCl	CsCl Density Gradient	Approx. 48 hrs	Labor intensive and requires specialized laboratory equipment

Total solution kit components

- 3—Fast-Trap™ virus purification filter units
- 3—Steriflip®-HV clarification filter units
- 3—Amicon® Ultra-4 concentrating filter units, 100 kDa NMWL (Lentivirus) or 50 kDa NMWL (Adenovirus)
- 1—10x Binding buffer, 20 mL
- 1—Equilibration buffer, 100 mL
- 1—Wash buffer, 200 mL
- 1—Elution buffer, 21 mL
- 1—Test tube stand



Ordering Information

Description	Qty/Pk	Catalogue No.
Fast-Trap™ Adenovirus Purification and Concentration Kit	3-pack	FTAV00003
Fast-Trap™ Lentivirus Purification and Concentration Kit	3-pack	FTLV00003

Related Products

Stericup®-GP filter, 0.22 µm Millipore Express® PLUS membrane	12/pk	SCGPU05RE
Steriflip®-GP filter, 0.22 µm Millipore Express® PLUS membrane	25/pk	SCGP00525
Steriflip® filter with Nylon, 100 µm Nylon Net	25/pk	SCNY00100
Millex®-GP filter, 0.22 µm Millipore Express® PLUS membrane	50/pk	SLGP033RS
Millex®-GS filter, 0.22 µm MCE membrane	50/pk	SLGS033SS

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