

## A VIRUS HARVEST UNIT (VHU) FOR THE CONTINUOUS HARVESTING OF LENTIVIRUS FROM SUSPENSION CELL CULTURES

Maurizio Cattaneo, Human Health Therapeutics, National Research Council Canada, Montreal, Canada  
mcattaneo@artemisbiosystems.com  
Sven Ansorge, Artemis Biosystems Canada, Inc., Montreal, Canada

For virus particles produced by cell culture systems, free intact virus particles as well as virus particles associated with host cell membranes or other viral particles and damaged virus fragments will be present. To reduce the amount of host cell fragments and/or virus aggregates it is critically important to reduce the shear stress applied to the cell culture during the harvesting step as much as possible. This is mainly accomplished by utilizing a low-shear Virus Harvest Unit (VHU™) with large pore size membranes (5-15µm) and by utilizing a low-shear pump. As shown in Table I, the VHU™, is able to clarify the broth containing the viral vectors from less than 500 Nephelometric Turbidity Units (NTU) down to less than 16 NTU. In contrast the turbidity of a broth harvested by centrifugation from a batch is around 50-90 NTU and the turbidity of the harvest stream from an acoustic filter (Biosep) is 33 NTU. These results suggest it may be possible to eliminate the secondary clarification steps when using the VHU unit as the virus harvesting process mode.

| Process Mode | Turbidity (NTU) |                     |            |
|--------------|-----------------|---------------------|------------|
|              | Broth           | Post-Harvest device | clarified  |
| Batch        | 50-90           | N/A                 | Target: ~5 |
| VHU          | <500            | <16                 | N/A        |
| Biosep       | N/A             | 33                  | 13         |

Table 1. Comparison of nephelometric turbidity (NTU) between batch harvesting and continuous harvesting devices such as the Virus Harvest Unit (VHU) and the acoustic filter (Biosep).