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USE OF SULFATED CELLULOSE MEMBRANE ADSORBERS TO INTENSIFY PURIFICATION OF CELL CULTURED-DERIVED INFLUENZA A AND B VIRUSES

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New generation of cell culture-based vaccines enables faster response to pandemic outbreaks and helps coping with the increasing demand for seasonal vaccines. Besides efficient upstream processing technologies, appropriate economic and robust downstream processing is key to consistently achieve high yields. Chromatography membranes have been extensively evaluated to capture viruses at laboratory scale, for influenza, adenovirus or virus like particles. They have shown great potential to intensify processes thanks to a high binding capacity, high flow-rate and ease of use and are now commonly used in new generation of vaccine processes. We present here Sartobind SC, a novel sulfated cellulose membrane adsorber, for the capture of Influenza.

In a recent study, the binding capacity and the purification performance of two bead-based resins and Sartobind SC was compared for three influenza virus strains (H1N1, H3N2 and B) produced in MDCK suspension cells in a chemically defined medium. The dynamic binding capacity for the sulfated cellulose membrane adsorbers was consistently higher than for the resins (8 to 22-fold). Overall, recovery of virus varied between 66% and 81%. Total protein and DNA removal were>74% and>96%, respectively. Due to the higher operating flow rate and binding capacity, the productivity with the membrane adsorbers was on average 25-times higher than with the resins.

This purification platform based on sulfated cellulose can intensify processes and therefore reduce the cost of influenza purification. This ligand is also a promising candidate for other viruses such as vaccinia, RSV, HSV or measles.