

Concentration of Oncolytic Measles Viruses from Clarified Supernatant by Tangential Flow Filtration

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Cancer is still a major concern of our modern society not solved by conventional cancer therapies. Therefore, new strategies of cancer treatment have been investigated among them the application of oncolytic Measles virus (OMV). The high potential of OMV was demonstrated in a clinical trial showing full remission from hitherto incurable cancer [1]. However, for an effective cancer treatment, a high amount of infective OMV particles of at least 10^{11} TCID₅₀ per dose are needed [1]. In addition, the OMV has to be highly pure referring the limits of vaccines. This requires the establishment of an ultra-high titer production process including an efficient downstream processing (DSP). The DSP is still the major bottleneck and must obtain the OMV infectivity and simultaneously remove impurities like host cell proteins (HCP), host cell DNA (hcDNA) and non-infective OMV particles.

For an ultra-high titer OMV production (10^{12} TCID₅₀ in just 0.5 L [2]), developed in our institute, we aim to establish a suitable DSP. Here, tangential flow filtration (TFF) is used, because it can easily process large volumes, remove the majority of impurities and highly concentrate infective OMV. We tested several polyether sulfone-based membranes with different molecular weight cut-offs (MWCO) for the application in OMV purification. We especially evaluated the TFF process conditions (e.g. shear stress) regarding the recovery of OMV infectivity. The results showed that TFF using membranes with MWCO of 100 nm is a suitable process to achieve pure and infective OMV in high concentration.

References

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