

Improvement of Virus-Like Particle characterization using new AF4 channel technology

Virus-Like Particles (VLPs), used for vaccination and immune stimulation, are of growing interest in pharmaceutical sciences. For quality assurance there is a tremendous need for techniques allowing the identification of different VLP fractions (fragments, monomers, dimers, trimers and aggregates). It has recently been demonstrated that the separation and subsequent quantification of different VLP species is possible by AF4. However, some disadvantages, like long equilibration and analysis time, the need for high sample amounts and large eluent volumes, must be addressed. In this study we investigated whether these drawbacks can be overcome by using new, smaller-scale channel geometries.

A stressed VLP sample was analyzed by AF4 (equipped with a DAWN and UV detection) by using either Wyatt's standard channel (25 cm) or Wyatt's new channel (18 cm) with a spacer height of 350 μm .

Comparative AF4 measurements of VLPs with the standard channel (25 cm) and the new channel (18 cm) revealed similar peak heights when 20 μg VLP were injected in the standard channel or when 10 μg VLP were injected in the smaller channel, respectively (Figure 1). Increased peak heights obtained with the new channel are due to sharper peak resolutions. Thus, analysis is possible with significantly less sample (Figure 2).

The standard channel technology has limitations concerning sample amount and separation time. By contrast, applying Wyatt's new channel technology, far smaller VLP amounts can be used in clearly shorter times and remarkably lower eluent volumes. Thus, the new smaller channel technology is a clear improvement for VLP characterization as compared to the standard channel.

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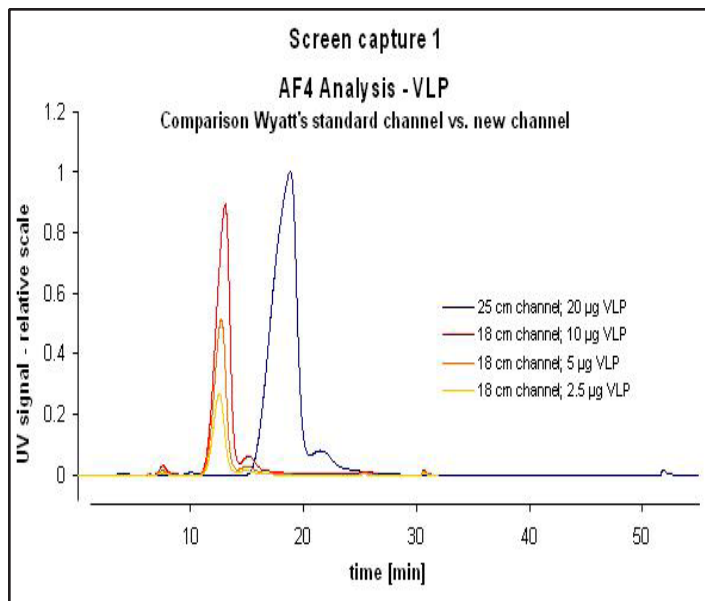


Figure 1. Comparable peak heights despite different mass injections.

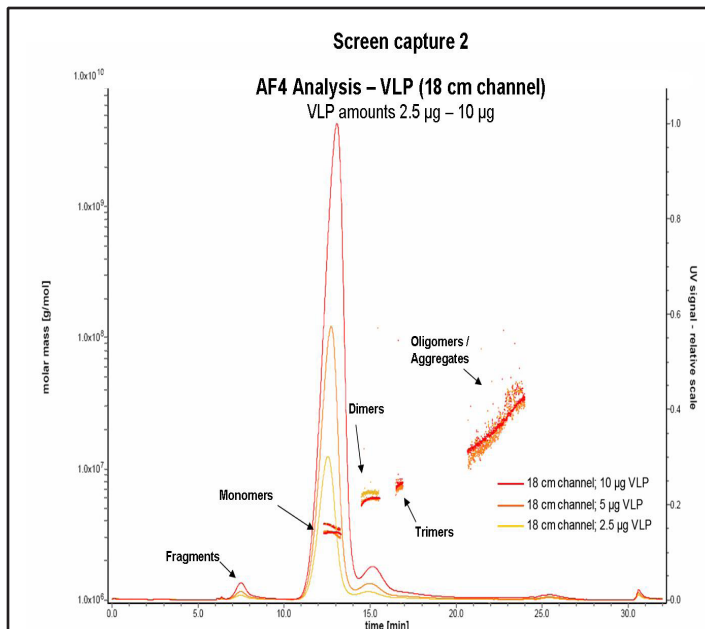
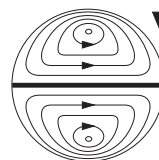


Figure 2. Beautiful peaks even with half the injected mass.



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