

Gene delivery via AAV: enhanced Adeno Associated virus characterization using multiple technologies DLS + SEC + DSC

Genome Engineering

Ulf Nobbmann (ulf.nobbmann@malvern.com), Malvern Panalytical, **Jonathan Mehtala**, Malvern Panalytical, **John Stenson**, Malvern Panalytical, **Natalia Markova**, Malvern Panalytical

Some Covid-19 vaccines involve the introduction of messenger RNA (mRNA) to trigger an immune response to the spike proteins of the SARS-CoV-2 coronavirus. One potential gene transfer vector to deliver this mRNA payload are Adeno-Associated Viruses (AAVs). Access to biophysical techniques present in many core facilities can provide fundamental insights for research and development of vaccine candidates.

We show how we obtain the concentration for monodisperse, intact recombinant rAAV capsids with a modified label-free light scattering method. This agrees well with the standard ELISA method, yet is much faster to perform. However, when capsid aggregates are present, concentration results deviate by 45%.

With advanced chromatography we determine the ratio of capsids filled with genetic material related to their efficacy. Calorimetry can measure the thermal stability and transition temperatures, and provide fingerprints of higher order structure distinguishing loaded from empty AAV transfer vectors.