Assessing the stability of a SARS-Cov-2 reference material using dynamic light scattering

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During the heights of the COVID-19 epidemic, testing of wastewater to track the spread of the disease became vital in Australia. The National Measurement Institute was one of the early institutes in the world that developed a reference material (SARS-Cov-2) to assist in this testing, and its responsibility in the ColoSSoS inter-laboratory study proved immensely useful to testing laboratories around the country.[1]

Here, we present an approach to assess the stability and lysis characteristics of the immobilised SARS-Cov-2 reference material using dynamic light scattering (DLS). The SARS-Cov-2 samples were prepared in fetal bovine serum (FBS) buffers, and the as-prepared samples were measured, as well as the FBS buffers without the immobilised virus. To assist in assessing the lysing process, a small amount of Tween-20 detergent was added to some samples, and all the samples were cycled through a temperature cycle and measured at various time points.

This study indicates that a measurement technique like DLS can be utilised to gain more insight in how typical lipid particle systems responds to additive and temperature changes, something which might prove useful when trying to optimise the loading and release dynamics of similar particles.

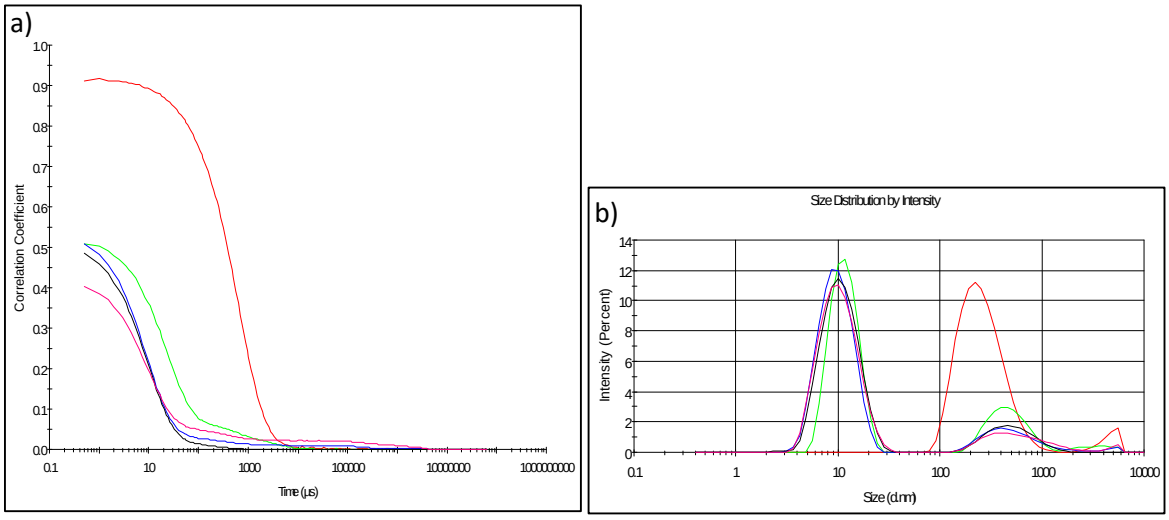

Figure 1: Illustrations of change in particle size indicative of rupture of the membrane and release of the particle load.

References:

[1] https://www.waterra.com.au/project/colossos-inter-laboratory-study/, accessed 1 March 2024