Comprehensive Characterization and Quantification of Lipid Nanoparticle-Based RNA Formulations

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The therapeutic potential of lipid nanoparticles (LNPs) as delivery vehicles has been demonstrated in recent years cumulating in the current emergency use of the mRNA based SARS-CoV-2 vaccines. In order to ensure the safety and efficacy of the LNP-RNA vaccine or therapeutics, various quality attributes of LNP-RNA products need to be measured throughput the product development cycle. In this poster, we will demonstrate the use of a dynamic light scattering (DLS) Plate Reader for fast screening and quality control of the LNP preparations, and multi-angle light scattering (MALS) combined with ultraviolet (UV) and refractive index (dRI) detectors following size exclusion chromatography (SEC) or field flow fractionation (FFF) separation for in-depth characterization. SEC or FFF provides sized based separation, and MALS, UV, and dRI detectors, on the other hand, enables biophysical characterization. We will show the data from the online detectors for the quantitation of particle size distribution, particle concentration, molecular weights of RNA and lipids, and sized-based RNA payload distribution of the LNP-RNA samples.