

# **Advanced Characterization of Lipid-RNA therapeutics**

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RNA and lipid-based therapeutics have emerged as a promising avenue for the treatment of various diseases. mRNA-based vaccines were the most utilized COVID-19 vaccines in Europe and USA, they use lipid nanoparticles to protect the mRNA cargo. In addition to vaccines against infectious diseases RNA therapeutics are being developed in several therapeutic areas: cancer therapy, rare diseases, neuroscience.

The characterization of these nanomedicines is challenging due to their intrinsic complexity. Their accurate pre-clinical characterization requires combination of physicochemical, immunological and toxicological assays [1].

In this presentation, I will address the difficulties in measuring the key properties of the complete formulation (the drug product, in regulatory terminology), the available techniques to measure them and the gaps still existing in our understanding of these challenging formulations.

[1] Guerrini, G., Magrì, D., Gioria, S., Medagliani, D., & Calzolari, L. (2022). Characterization of nanoparticles-based vaccines for COVID-19. *Nature Nanotechnology*, 1-7.