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Investigation of pH-responsiveness inside lipid nanoparticles for parenteral mRNA application using small-angle X-ray scattering (Part 1)

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RNA-based nanomedicines have proven to be a promising new class of drugs, with their broad field of potential applications ranging from protein substitution, over tumour immunotherapy, up to the recent success of being the first approved Covid-19 vaccines. The basic concept for all mRNA drugs is to deliver protein-encoding mRNA, like tumour or virus antigens, into target cells in order to be transfected into the protein and for example induce antitumoral responses. To make intravenous application of mRNA possible, formulations are required that protect the mRNA from degradation through the ubiquitous nucleases, deliver it to the target site and promote cellular uptake and translation. Non-viral lipid-based delivery vehicles have demonstrated to be suitable for this purpose.

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