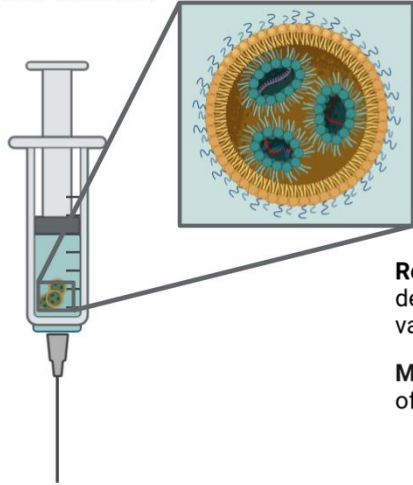


# Interaction and fusion of lipid nanoparticles (LNPs) with pore-spanning membranes (PSMs)

LNPs as a platform for therapeutics and vaccines<sup>[1]</sup>

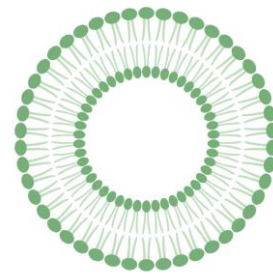


**Recent application:** development of mRNA-LNP vaccines for SARS-CoV-2

**Major bottleneck:** low efficiency of the **Endosomal Escape**

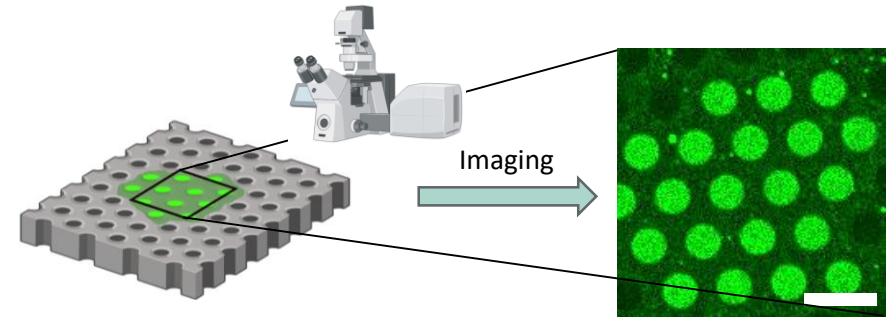
Pore-spanning membranes

PSMs as a model system for mimicking the endosomal membrane



**Vesicles** with the endosomal membrane lipid composition

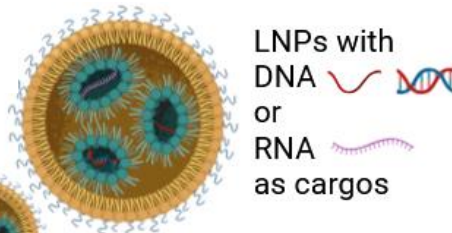
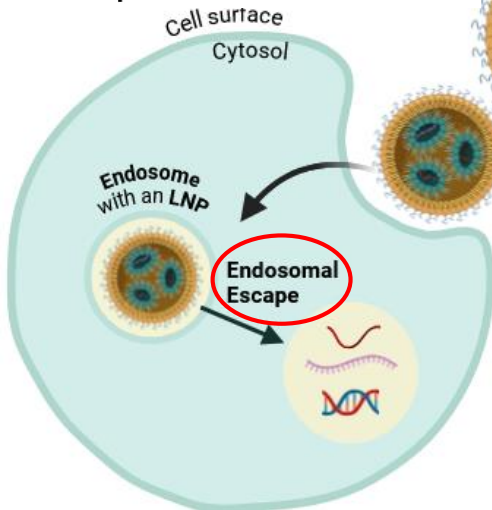
Spreading on porous substrates



Quasi-planar membrane geometry<sup>[2]</sup>

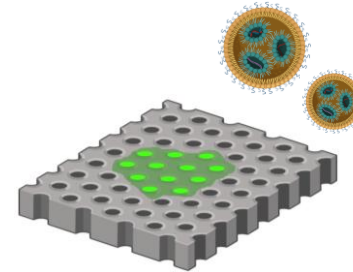
Switching of the solution conditions possible

LNP uptake and the Endosomal Escape<sup>[1]</sup>



**Natural system:** interaction and fusion of the cargo carrying LNPs with the endosomal membrane

**Main Goal:** to investigate the interaction between LNPs and PSMs, with the aim of mimicking the process of endosomal escape in a natural system.



**Artificial model system:** combining LNPs with PSMs

**Methods:**

Dynamic light scattering  
Fluorescence spectroscopy  
Fluorescence microscopy  
etc.

Lipid nanoparticles