



CD4 T CELL TARGETING LIPID NANOPARTICLES IN THE SEARCH FOR A GENETIC HIV CURE

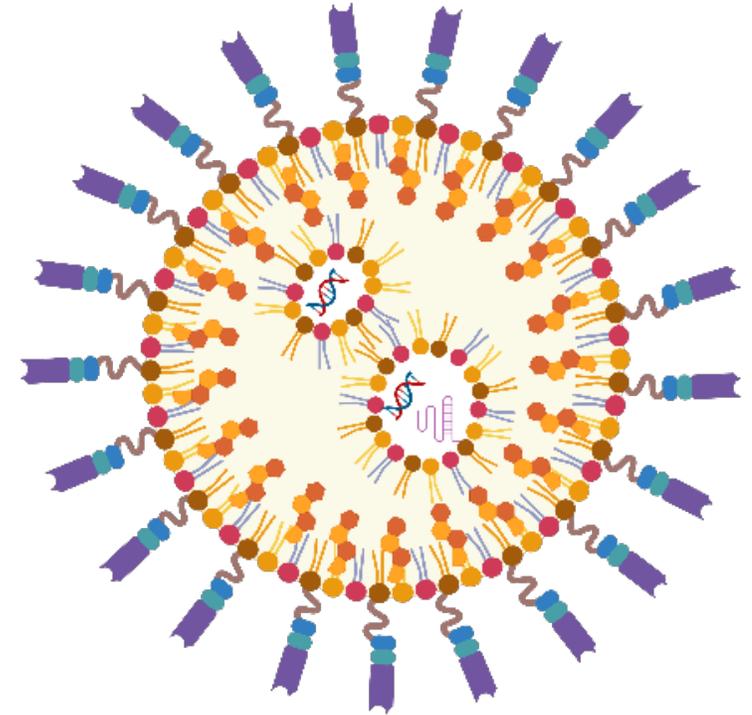
OVERVIEW

INTRODUCTION

LIPID NANOPARTICLES (LNPs)

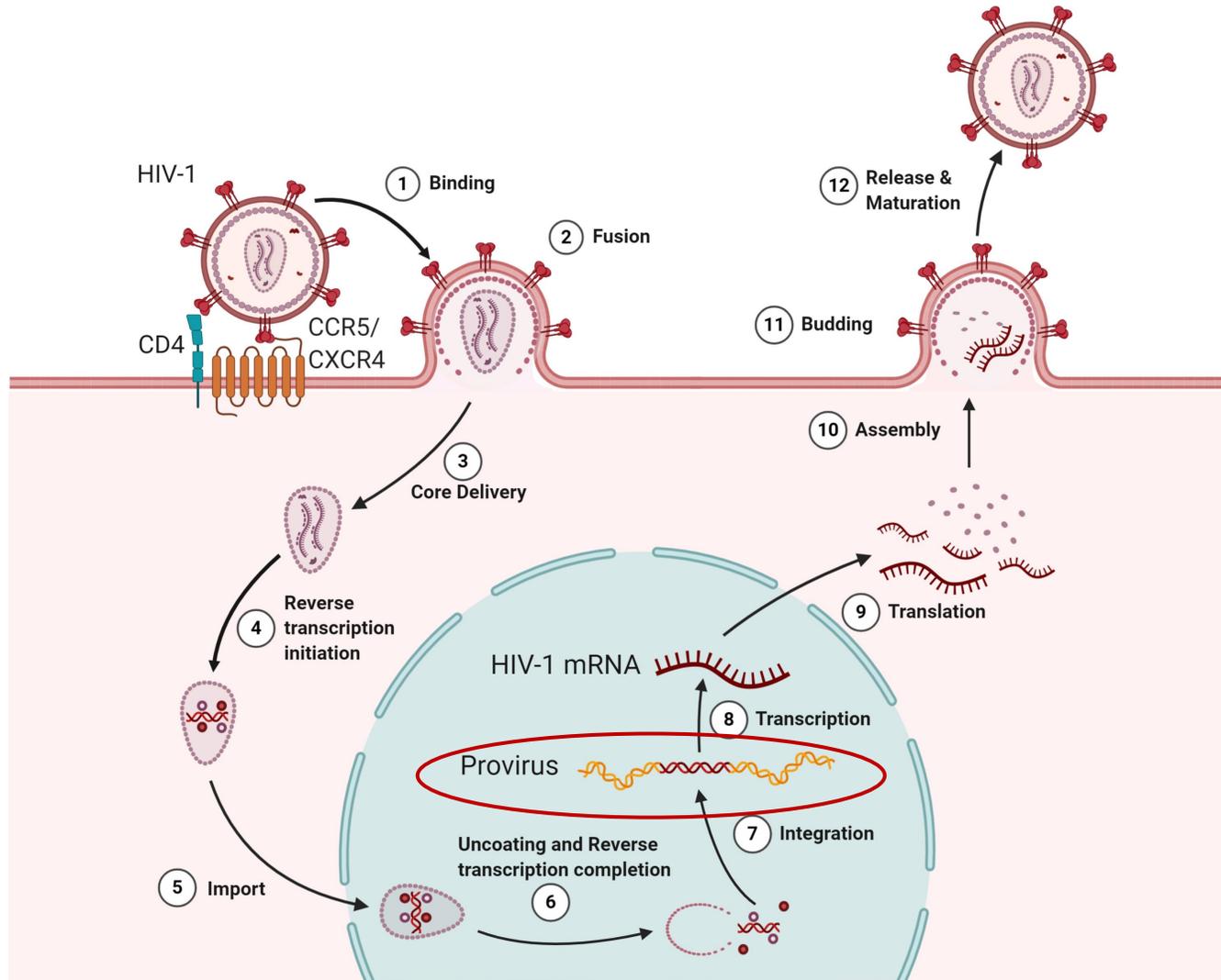
CD4 TARGETING NANOBODY

CONCLUSIONS & PERSPECTIVES

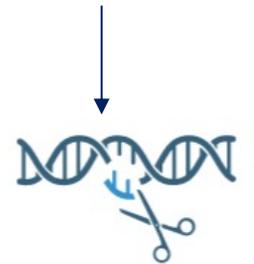


Nanobody-coupled lipid nanoparticle

INTRODUCTION

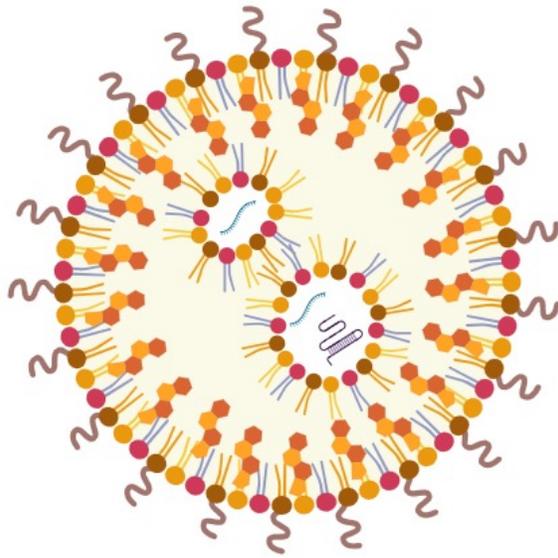


Single guide RNA



Cas9 nuclease

DELIVERY BY LIPID NANOPARTICLES (LNP)



- Transient Cas9 expression
- Low manufacturing costs
- Upscaling capacity

● Ionizable lipid

● Sterol

● Phospholipid

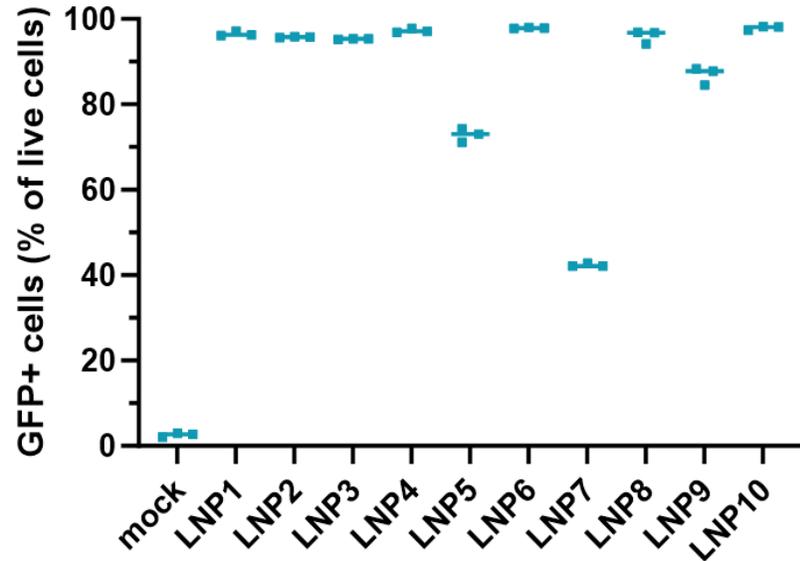
● Cas9 mRNA

● PEG-lipid

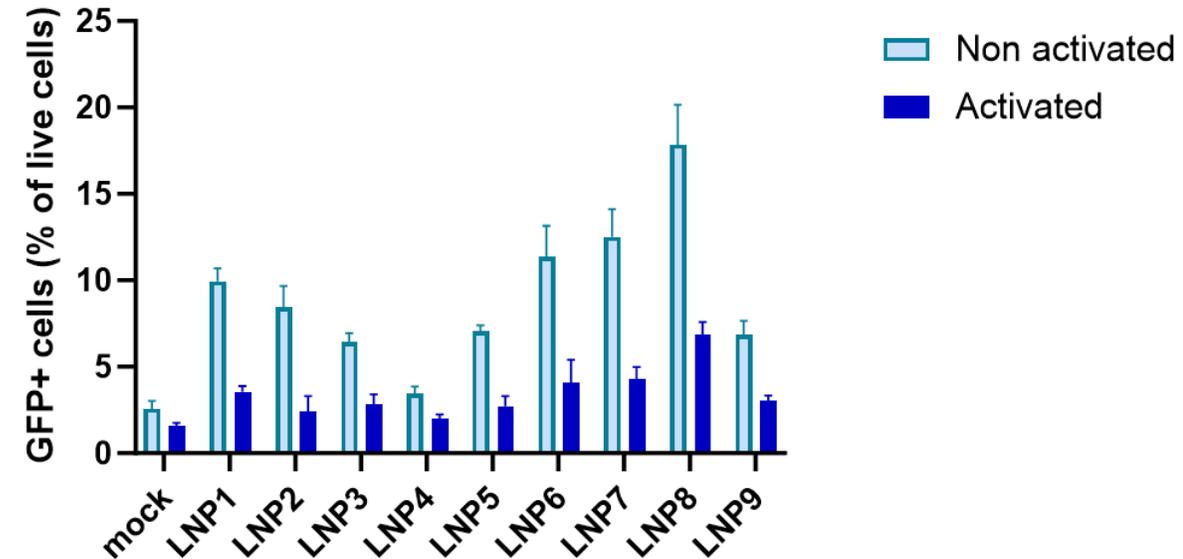
● sgRNA

TRANSFECTION OF T CELLS

Transfection efficiency of SupT1 cells



Transfection efficiency of primary human CD4 cells



- Succes depends on LNP composition



Ionizable lipid



Sterol

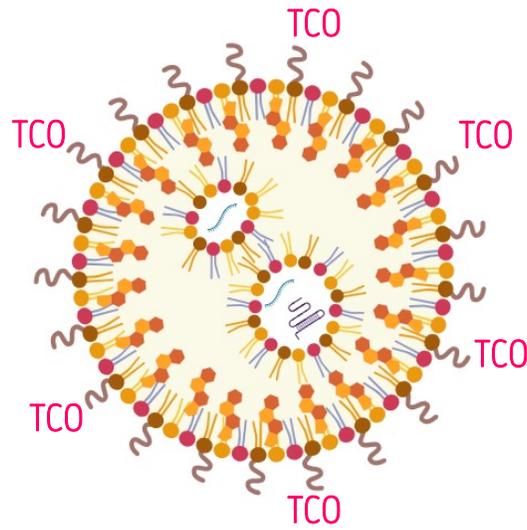


Phospholipid



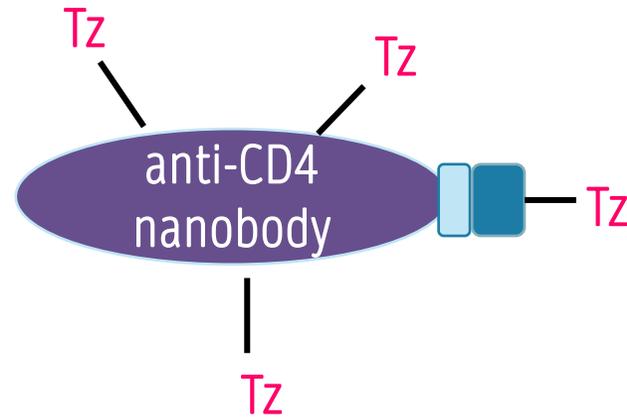
PEG-lipid

NANOBODY-COUPLED LNP USING CLICK CHEMISTRY

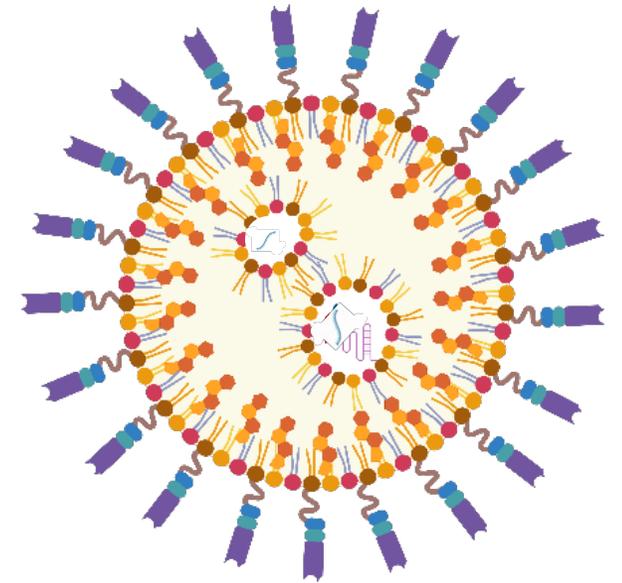


TCO-modified LNP

+

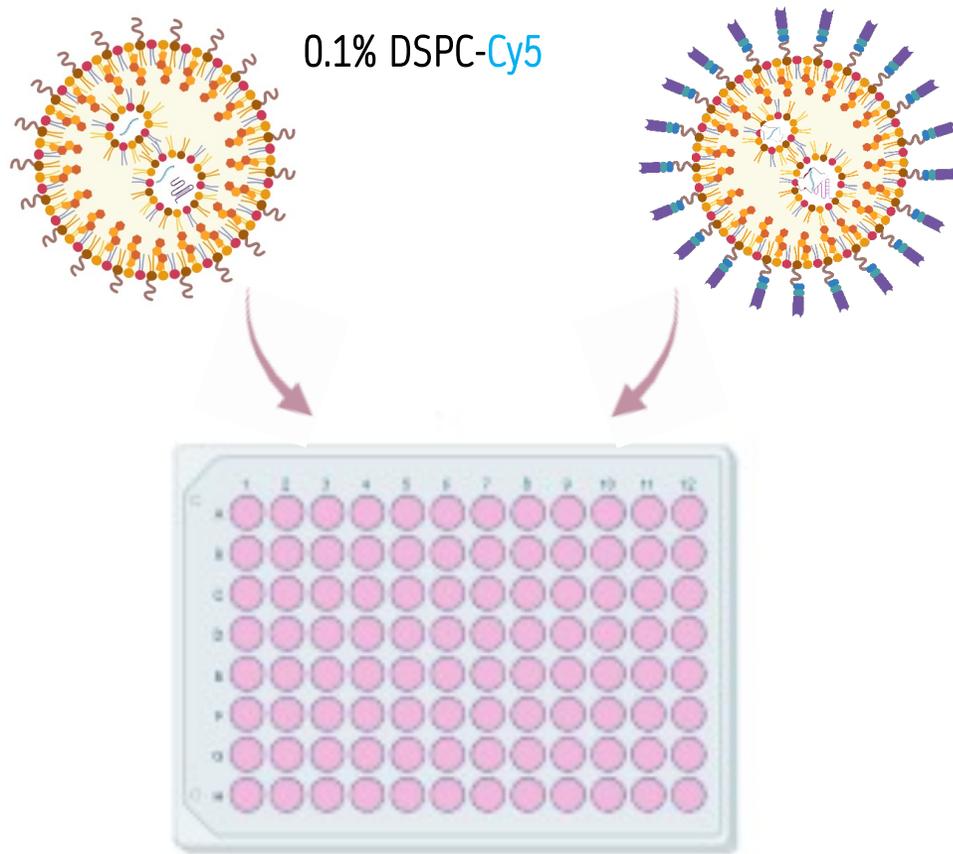


CD4 specific and selective nanobody clone 3F11
With Tz modifications

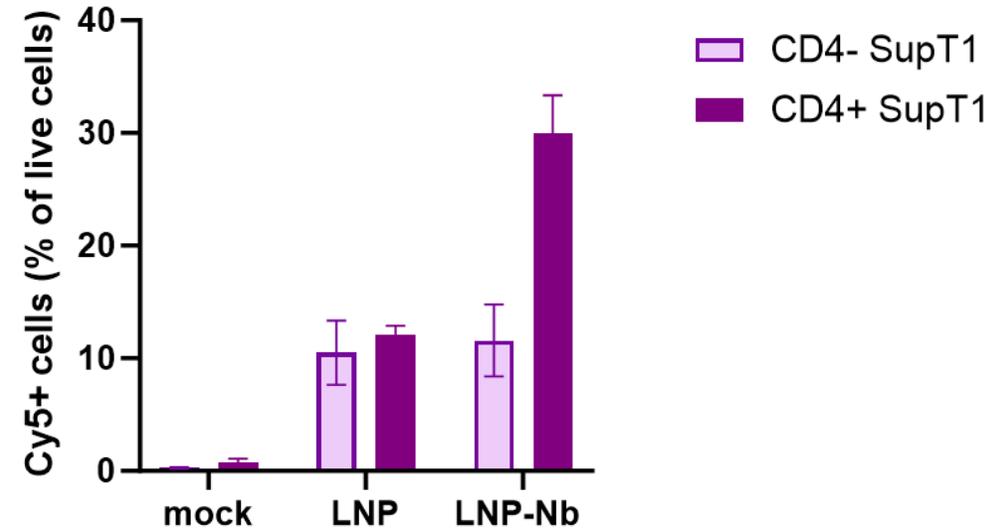


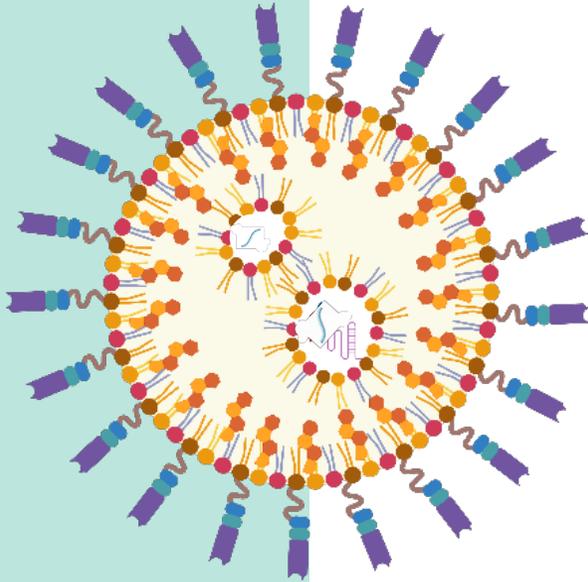
CD4-targeted LNP

LNP-NANOBODY BINDING TO CD4 CELLS



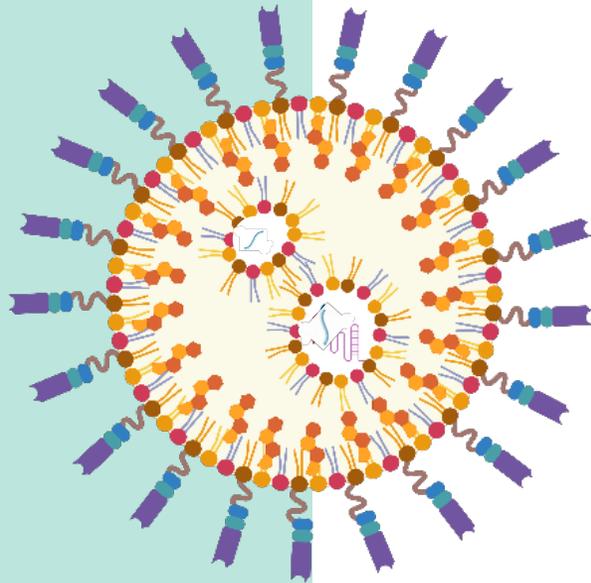
Binding of LNP-Nanobody to cells





CONCLUSIONS

- LNPs successfully transfect T cell lines
- Transfection efficiency of primary CD4 cells can be increased by using optimal LNP composition
- Anti-CD4 nanobody clone 3F11 can target LNPs towards CD4+ cells by exploiting Tz-TCO click chemistry



FUTURE PERSPECTIVES

[nature](#) > [news](#) > article

NEWS | 16 November 2023

UK first to approve CRISPR treatment for diseases: what you need to know

The landmark decision could transform the treatment of sickle-cell disease and β -thalassaemia – but the technology is expensive.

THANK YOU!

- TEAM LINOS & SARAH
- TEAM BRUNO DE GEEST

