Supporting Information-

Investigation of Binary Lipid Mixtures of a Triple-Chained Cationic Lipid and Phospholipids Suitable for Lipofection

Christian Wölk,*†,# Christopher Janich,# Annette Meister,‡ Simon Drescher,# Andreas Langner,# Gerald Brezesinski,§ Udo Bakowsky‡

† Philipps University Marburg, Department of Pharmaceutical Technology and Biopharmaceutics, Ketzerbach 63, 35037 Marburg, Germany

# Martin Luther University (MLU) Halle-Wittenberg, Institute of Pharmacy, Wolfgang-Langenbeck-Str. 4, 06120 Halle (Saale), Germany

‡ MLU Halle-Wittenberg, Center for Structure and Dynamics of Proteins (MZP), Weinbergweg 22, 06120 Halle (Saale), Germany

§ Max Planck Institute of Colloids and Interfaces, Am Mühlenberg 1, 14476 Potsdam, Germany

Corresponding Author:

*(C.W.)
Tel: +49-345-55-25078.
Fax: +49-345-55-27018.
Email: christian.woelk@pharmazie.uni-halle.de.
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1. TEM images of different lipid mixtures:

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Figure S2. DiTT4/DOPE mixture $X_{\text{DiTT4}} = 0.4$. 
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Figure S13. DiTT4/DMPC mixture $X_{\text{DiTT4}} = 0.5$. The arrows indicate disks observed edge-on (black arrows, disc oriented perpendicular to the surface of the grid) and face-on (blue arrows, disc oriented parallel to the surface of the grid), respectively, an observation indicating the presence of disc-like structures.
Figure S14. DiTT4/DMPC mixture $X_{\text{DiTT4}} = 0.6$. The arrows indicate disks observed edge-on (black arrows, disc oriented perpendicular to the surface of the grid) and face-on (blue arrows, disc oriented parallel to the surface of the grid), respectively, an observation indicating the presence of disc-like structures. The red arrows indicate stacks of discs in the edge-on view. The arrangement to stacks is also typical for discs in TEM.
Figure S15. DiTT4/DMPC mixture $X_{\text{DiTT4}} = 0.8$. The arrows indicate disks observed edge-on (black arrows, disc oriented perpendicular to the surface of the grid) and face-on (blue arrows, disc oriented parallel to the surface of the grid), respectively, an observation indicating the presence of disc-like structures. The red arrows indicate stacks of discs in the edge-on view. The arrangement to stacks is also typical for discs in TEM.
2. Cell Culture Screening:

Figure S16. Transfection efficiency (TE) of lipoplexes at different N/P-ratios and the corresponding cell viability 24 h after the transfection of A549 cells in absence of serum during the incubation time of the lipoplexes. Following lipid mixtures were used: DiTT4/DOPE (A), DiTT4/DMPE (B) and DiTT4/DMPC (C) with different molar fractions of DiTT4.
Figure S17. Transfection efficiency (TE) of lipoplexes at different N/P-ratios and the corresponding cell viability 24 h after the transfection of A549 cells in presence of 10% serum during the incubation time of the lipoplexes. Following lipid mixtures were used: DiTT4/DOPE (A), DiTT4/DMPE (B) and DiTT4/DMPC (C) with different molar fractions of DiTT4.
Figure S18. Transfection efficiency and the corresponding cell viability of **DiTT4/DMPC** ($X_{\text{DiTT4}} = 0.2$) lipoplexes as a function of the N/P-ratio 24 h after the transfection of HeLa and LLC-PK1 cells in presence of 10% serum during the incubation time of the lipoplexes. LF 2000 is the standard Lipofectamine 2000® in the most effective DNA/Lipofectamine 2000® ratio.
3. Correlation Functions of DLS Measurements of Lipoplexes:

Figure S19. Correlation functions of lipoplex dispersions in HEPES buffer pH 7.3 determined by DLS. The used lipid composition was DiTT4/DOPE with different \( x_{\text{DiTT4}} \) values which were complexed with pDNA at different N/P-ratios (see legend).
Figure S20. Correlation functions of lipoplex dispersions in HEPES buffer pH 7.3 determined by DLS. The used lipid composition was DiTT4/DMPE with different $x_{\text{DiTT4}}$ values which were complexed with pDNA at different N/P-ratios (see legend).
Figure S21. Correlation functions of lipoplex dispersions in HEPES buffer pH 7.3 determined by DLS. The used lipid composition was DiTT4/DMPC with different $x_{\text{DiTT4}}$ values which were complexed with pDNA at different N/P-ratios (see legend).