**Supplementary Data**

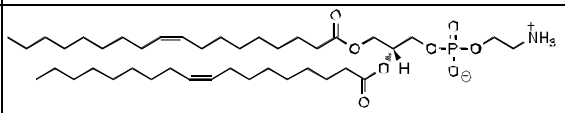
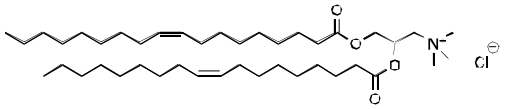
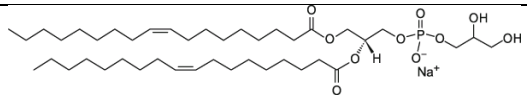
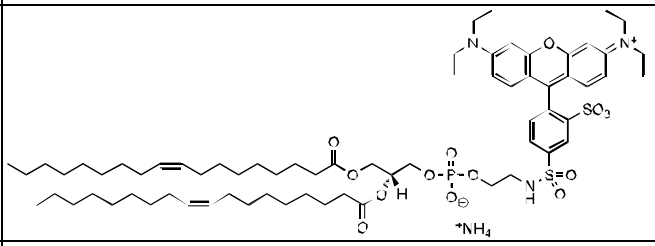
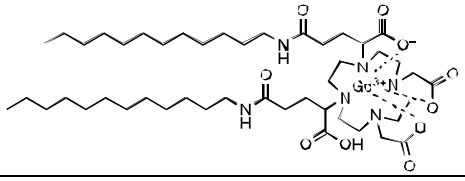
| Lipid | Chemical Name | Structure |
|---|---|---|
| DOPE | 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine |  |
| DOTAP | 1,2-dioleoyl-3-trimethylammonium-propane |  |
| DOPG | 1,2-dioleoyl-sn-glycero-3-phospho-(1'-rac-glycerol) |  |
| DOPE-Rhodamine | 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine-N-(lissamine rhodamine B sulfonyl) |  |
| $GdDOTA(GAC_{12})_2$ | |  |

**Table S1.** *Lipids and their structures used to formulate the liposomes.*

| Peptide | Amino Acid Sequence | Net Charge |
|---|---|---|
| $K_{16}$ | KKKKKKKKKKKKKKKK | +16 |
| NtS | Pyr-YNPKRYLIELPRAG-KKKKKKKKKKKKKKKK | +17 |
| Nt | Pyr-LYENKPRRPYILAG-KKKKKKKKKKKKKKKK | +17 |

**Table S2.** *Non-targeted, $K_{16}$ and NtS, and targeted, Nt, peptide sequences and structure used to formulate the LPD nanocomplexes*. Pyr = pyroglutamic acid.

| Liposome | Lipid 1 (mol %) | Lipid 2 (mol %) | Lipid 3 (mol %) | Lipid 4 (mol %) | Size (nm) | Zeta PD (mV) |
|---|---|---|---|---|---|---|
| Cationic Liposome | DOTAP (35) | DOPE (49) | $GdDOTA(GAC_{12})_2$ (15) | DOPE-Rhodamine (1) | 163.1 (±0.4) | +2 (±0.1) |
| Anionic Liposome | DOPG (35) | DOPE (49) | $GdDOTA(GAC_{12})_2$ (15) | DOPE-Rhodamine (1) | 140.8 (±7.1) | -66.4 (±1.3) |

**Table S3.** *Liposomes composition and associated size and zeta potential as measured by dynamic light scattering*