Supporting information

Redox-sensitive, cholesterol-bearing PEGylated poly(propyleneimine)-based dendrimersomes for drug and gene delivery to cancer cells

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Figure S1. FTIR spectra of (A) low-cholesterol and (B) high-cholesterol dendrimers.
Figure S2. FTIR spectra of (A) OPSS-PEG-SCM (B) DAB dendrimer and (C) thiocholesterol
Figure S3. $^1$H-NMR spectrum of low-cholesterol (A) and high-cholesterol (B) dendrimer (in CDCl$_3$, 500 MHz).
Figure S4. MALDI-TOF MS spectra of low-cholesterol (A) and high-cholesterol dendrimers (B)
Section S1. Lipid loading Calculations

The amount of lipid or cholesterol (CHOL) loading to modified dendrimer is calculated as the weight of conjugated CHOLSH as a percentage of the total average molecular weight:

Lipid-loading (%) = \( \frac{(n \times 401.72)}{[M]^+} \times 100 \)

Where, \( n \) is the number of cholesterol conjugated to modified dendrimer and \([M]^+\) is the average molecular weight of the modified dendrimers analyzed from MALDI-TOF MS.

Low-cholesterol dendrimer (DPSCL), lipid loading (%) = \( \frac{(1 \times 401.72)}{4210} \times 100 = 9.54\% \)

High-cholesterol dendrimer (DPSCH), lipid loading (%) = \( \frac{(2 \times 401.72)}{6492} \times 100 = 12.37\% \)

Figure S5. \(^1\)H-NMR spectrum of high-cholesterol dendrimer (in D$_2$O, 500 MHz)
Figure S6. Fluorescence spectra of N-Phenyl-1-naphthylamine in presence or absence of low-cholesterol (A) and high-cholesterol (B) dendrimer dispersions at various concentrations in PBS buffer (pH 7.4)
Figure S7. Transmittance of low-cholesterol (■) and high-cholesterol (○) dendrimer-based vesicles in function of temperature (400 µg/mL, pH 7.4).
Table S1. Results of phase transition analysis for low-cholesterol (DPSCL) and high-cholesterol (DPSCH) vesicles by DSC

<table>
<thead>
<tr>
<th>Dendrimer</th>
<th>Heating cycle</th>
<th>Endotherm Onset T (°C)</th>
<th>Endotherm Peak T (°C)</th>
<th>Endotherm enthalpy (J/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPSCL</td>
<td>1st</td>
<td>-0.8</td>
<td>0.8</td>
<td>-351.5</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>-0.8</td>
<td>0.8</td>
<td>-343.5</td>
</tr>
<tr>
<td>DPSCH</td>
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<td>-0.2</td>
<td>-2.03</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>0.6</td>
<td>-0.2</td>
<td>-10.26</td>
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</tbody>
</table>
Figure S8. Fluorescence emission spectra of Nile Red entrapped in low-cholesterol (A, C, E) and high-cholesterol (B, D, F) dendrimer-based vesicles (100 µg/mL in PBS, pH 7.4) in presence of glutathione (10 µM (A, B) and 10 mM (C, D)) at various time intervals (control: no glutathione) (E, F)
Figure S9. Gel retardation assay of low-cholesterol DAB (DPSCL) dendriplexes at various dendrimer: DNA weight ratios (0.5:1, 1:1, 2:1, 5:1, 10:1, 20:1)
Figure S10. Gel retardation assay of high-cholesterol DAB (DPSCH) dendriplexes at various dendrimer: DNA weight ratios (0.5:1, 1:1, 2:1, 5:1, 10:1, 20:1)
Figure S11. Flow cytometry histograms of PC3-Luc cells following 2 hours incubation with low-cholesterol dendriplex (dendrimer: DNA weight ratio 5:1 (A) or 10:1 (B)), high-cholesterol dendriplex (dendrimer: DNA weight ratio 5:1 (C) or 10:1 (D)) (Controls: DAB dendriplex (5:1) (E), DNA solution (F))