**Fig. S1** The GFP expression when Bel7402 cells were transfected with pEGFP-N1 using FA-L16-2-16 with different degrees of FA-PEG-DOPE incorporation.

**Fig. S2** The transfection efficiency of FA-L16-2-16 with different degrees of FA-PEG-DOPE incorporation in HepG2 cells and HL7702 cells using a luciferase reporter gene.

**Fig. S3** TEM images of L16-2-16/DNA/DOX and 2% FA-L16-2-16/DNA/DOX complexes at DNA/DOX mass ratio of 9 and N/P ratio of 2. The scale bar is 500 nm.
**Fig. S4** Cell cytotoxicity of L16-2-16-, 2% FA-L16-2-16- and Lipofectamine 2000-mediated transfection in Bel7402 cells using a luciferase reporter gene. Data as mean values± S.D. (n = 3). * P<0.01 compared with 2% FA-L16-2-16/pCMV-Luc-treated group.