**Supplemental information** 



**Figure S1** Physicochemical analyses of peptide-displaying LPs. LPs were modified with different pre-S1 peptide. Particle size, PDI, and  $\varsigma$ -potential were measured by Zetasizer Nano ZS. N=3, error bars represent SDs.



Figure S2 Immunostaining of cell-surface NTCP. Scale bars represent 20 µm.



**Figure S3** Optimization of pre-S1(30-42)-displaying LPs. Pre-S1(30-42) peptide was conjugated on the LPs containing different amount of DOPE-MAL. Particle size, PDI and  $\varsigma$ -potential were measured by Zetasizer Nano ZS. N=3, error bars represent SDs.



**Figure S4** Cellular attachment of pre-S1(30-42)-displaying LPs with different DOPE-MAL ratios in HepG2 cells. N=3, error bars represent SDs.



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**re S5** Time course study of pre-S1 peptide-displaying LPs and unmodified LPs. Cellular attachment and entry of pre-S1 (30–42)-displaying CellVue-labeled LPs, pre-S1 (47–77)-displaying CellVue-labeled LPs, and CellVue-labeled unmodified LPs in HepG2 cells for 1 h, 3 h, and 6 h. Scale bars represent 20  $\mu$ m. N=3, error bars represent SDs.



Figure S6 Intracellular trafficking analyses of unmodified LPs with/without heparin, Sodium chlorate, and Heparinase I. Scale bars represent 20  $\mu$ m.



Figure S7 Intracellular distribution of doxorubicin by peptide-displaying LPs. Scale bars represent 20  $\mu$ m.



**Figure S8** Cytotoxicity analyses of peptide-displaying LPs and unmodified LPs without DOX. N=3, error bars represent SDs.