Supporting Information

NIR-Induced Spatiotemporally Controlled Gene Silencing by Upconversion Nanoparticle-Based siRNA Nanocarrier

Guojun Chen1, 2, #, Ben Ma2, 3, #, Ruosen Xie1, 2, Yuyuan Wang1, 2, Kefeng Dou3, **, and Shaoqin Gong1, 2, 4, *

Figure S1:

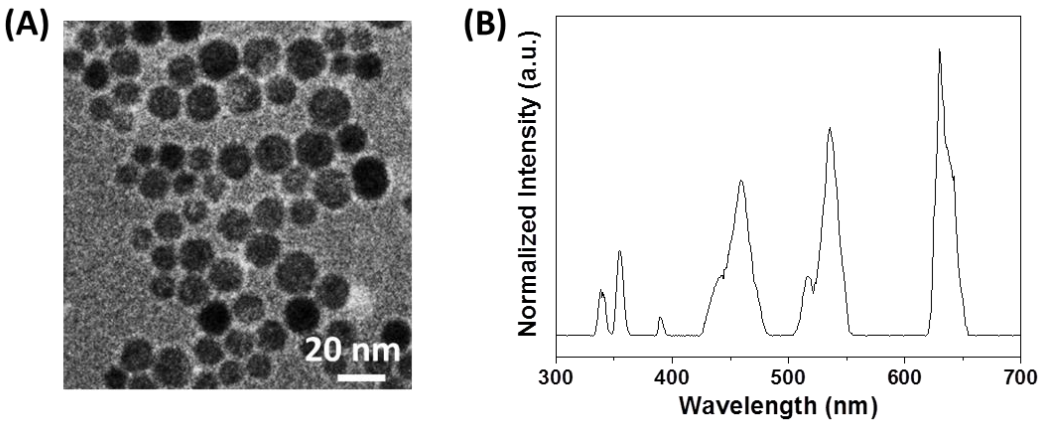

Figure S1: (A) TEM image of the CD-UCNPs. (B) Upconversion emission spectrum of the CD-UCNPs.

Figure S2:

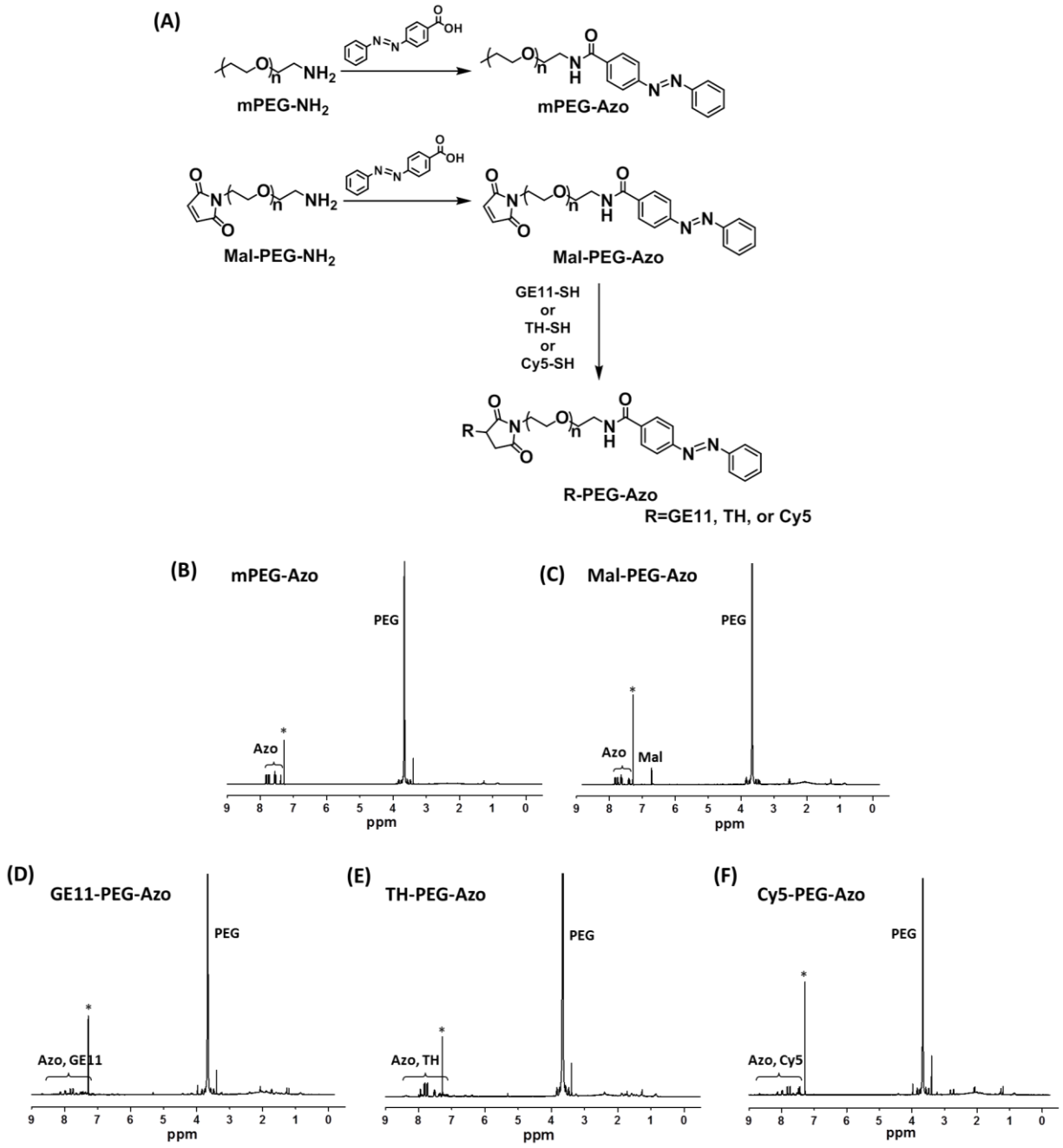

Figure S2: (A) A synthetic scheme of Azo-PEGs. ^{1}H NMR spectra of (A) mPEG-Azo, (B) Mal-PEG-Azo, (C) GE11-PEG-Azo, and (D) Cy5-PEG-Azo.

Figure S3:

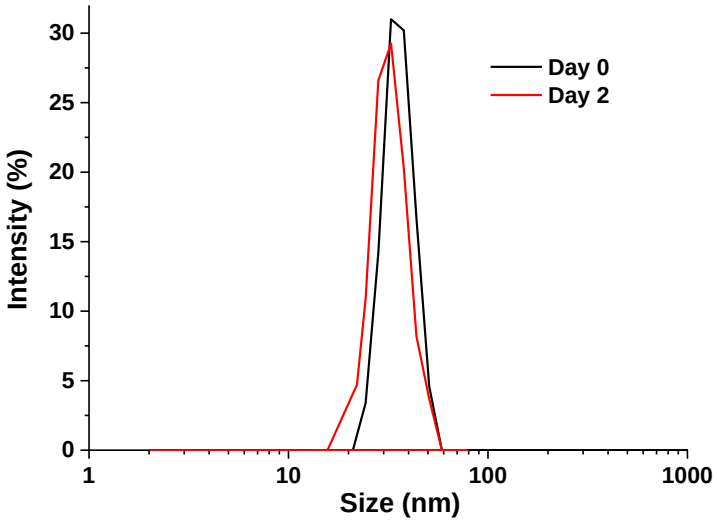

Figure S3: Stability test of the UCNP-(CD/Azo)-siRNA/PEG NPs in the cell culture media by DLS analyses.

Figure S4:

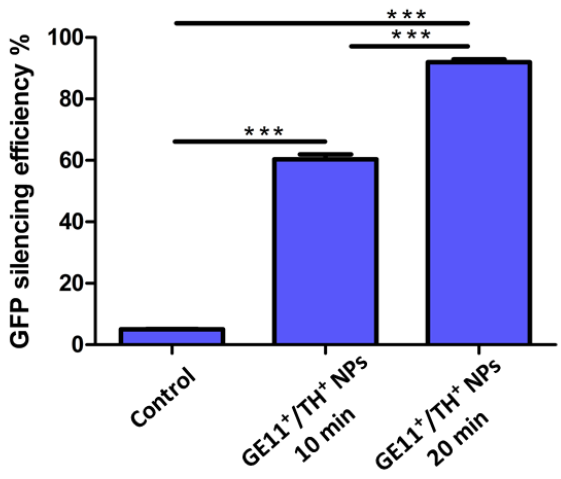

Figure S4: *In vitro* gene silencing efficiency assessment with different NIR laser irradiation time. Cells were first treated with UCNP-(CD/Azo)-siRNA/PEG NPs at pH 6.7 for 4 h, followed by NIR irradiation for 10 min or 20 min. ***: $p < 0.001$.

Figure S5:

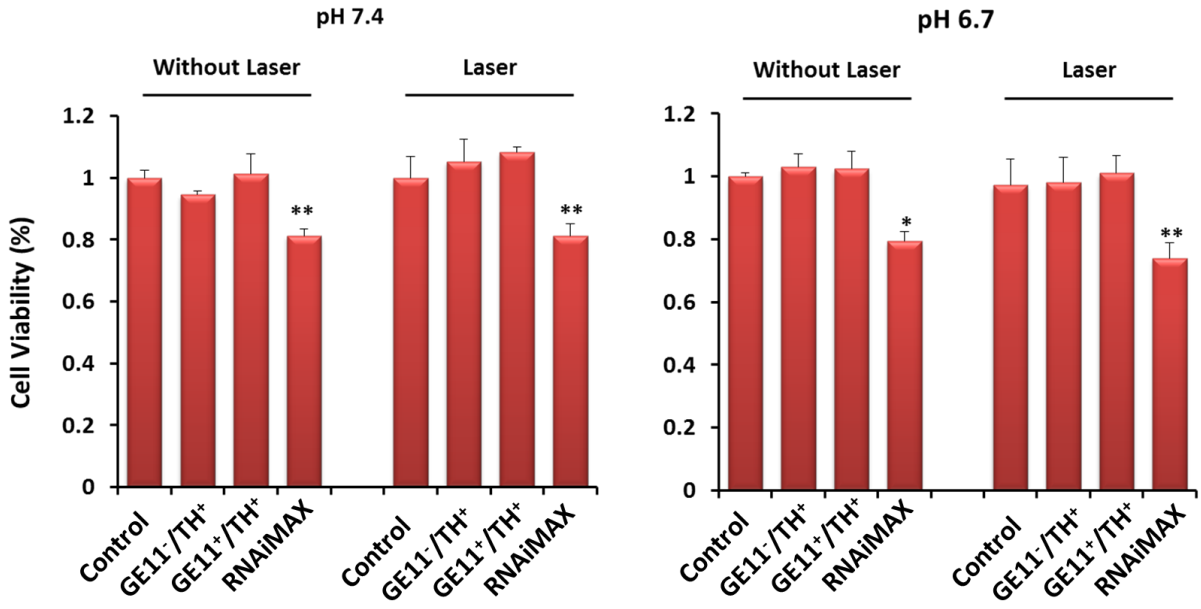

Figure S5: Cell viability tests using an MTT assay in a 2D monolayer cell model. Data are presented as the mean ± standard deviation (n = 5). *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

Figure S6:

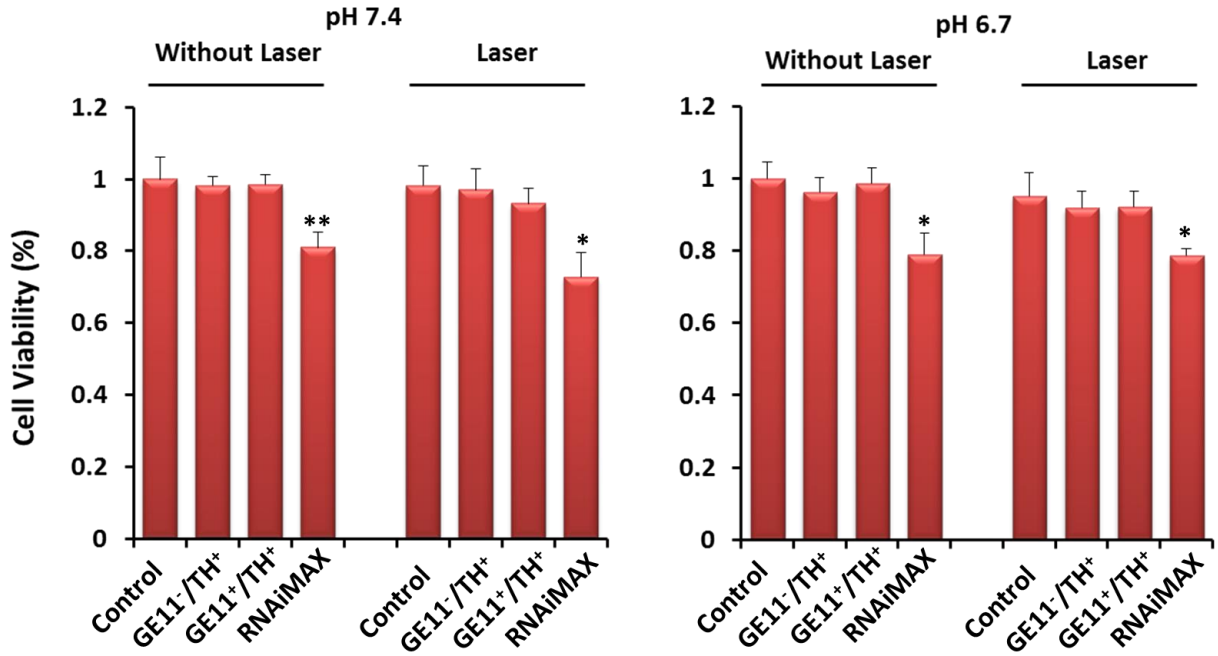

Figure S6: Cell viability tests using an MTT assay in a 3D MCTS model. Data are presented as the mean ± standard deviation (n = 5). *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.