Genetic Recombination Poly(L-lysine) Functionalized Apoferritin Nanocages as Resembled Viral Capsid Nanometer-Sized Platforms for Gene Therapy

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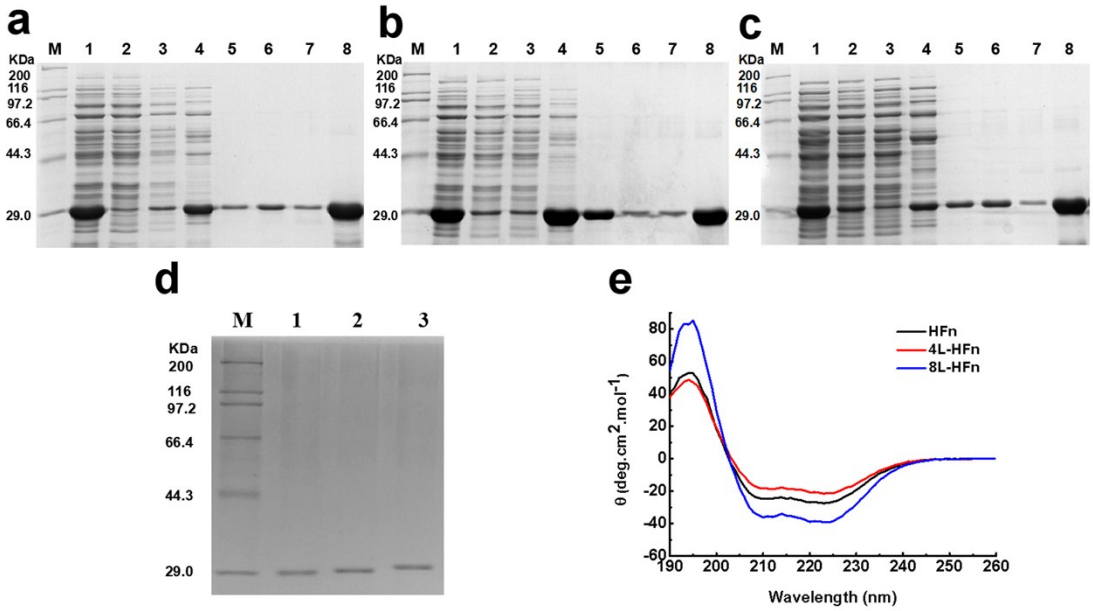

Figure S1. Characterization of HFn and 4L-HFn. The purification of HFn (a), 4L-HFn (b), and 8L-HFn (c) were analyzed by 12 % SDS-PAGE. Lane M: Protein marker; Lane 1:supernatant after heat; Lane 2: sample effluent; Lane 3: effluent washed by binding buffer; Lane 4-8: protein gradient eluted by 30 mM, 50 mM, 70 mM, 90 mM, and 300 mM imidazole, successively. (d) SDS-PAGE results of HFn, 4L-HFn, and 8L-HFn on 12 % resolving gel. (e) CD spectra results of HFn, 4L-HFn, and 8L-HFn nanocages.

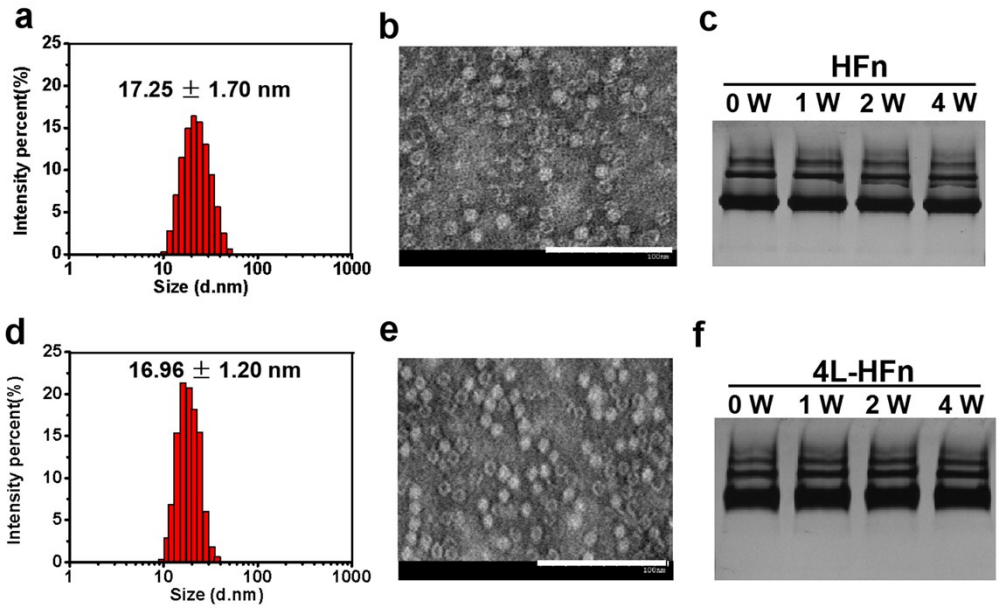

Figure S2. Particle size distribution of HFn (a) and 4L-HFn (d) in pH 8.0 buffer (20 mM Tris, 0.15 M NaCl). Morphological observed by TEM of HFn (b) and 4L-HFn (e) in pH 8.0 buffer (20 mM Tris, 0.15 M NaCl). The stability of HFn (c) and 4L-HFn (f) stored at 4 °C for 4 weeks detected by Native PAGE.

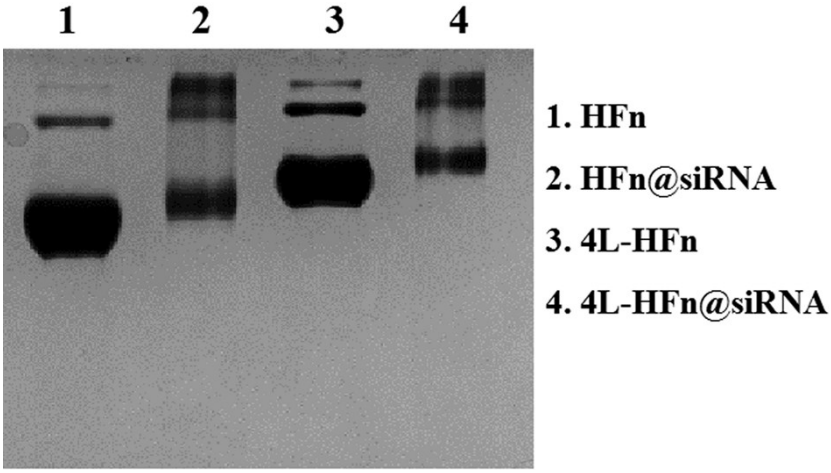

Figure S3. Characterization of the reassembly protein cage of HFn@siRNA and 4L-HFn@siRNA nanoparticles detected by 6% non-continuous native gel electrophoresis.

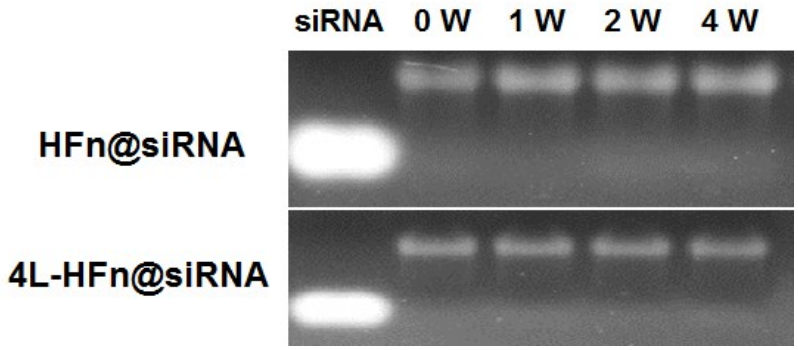

Figure S4. Stability of HFn@siRNA (1:8) and 4L-HFn@siRNA (1:8) nanoparticles stored at 4 °C for 4 weeks, detected by 2% agarose gel electrophoresis.

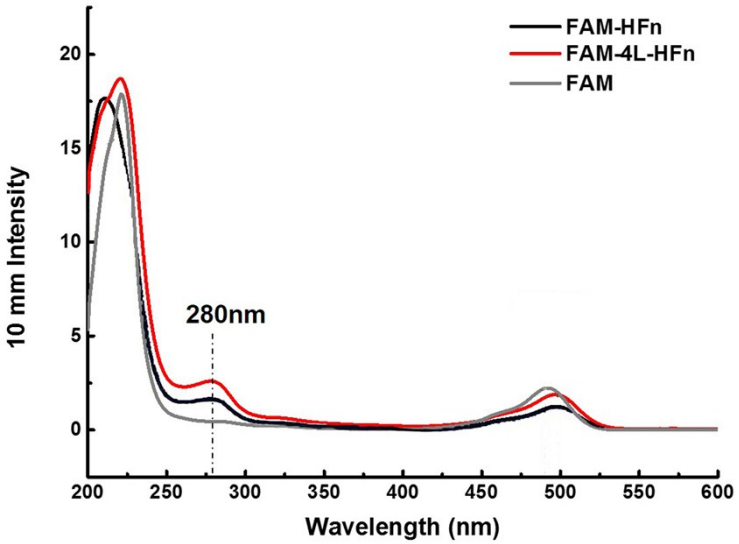

Figure S5. UV vis absorption spectra of FAM-HFn, FAM-4L-HFn and FAM. Except for 280 nm, FAM-4L-HFn exhibited the absorption peak of FAM at 495 nm, indicating the successful conjugation of FAM to HFn and 4L-HFn.

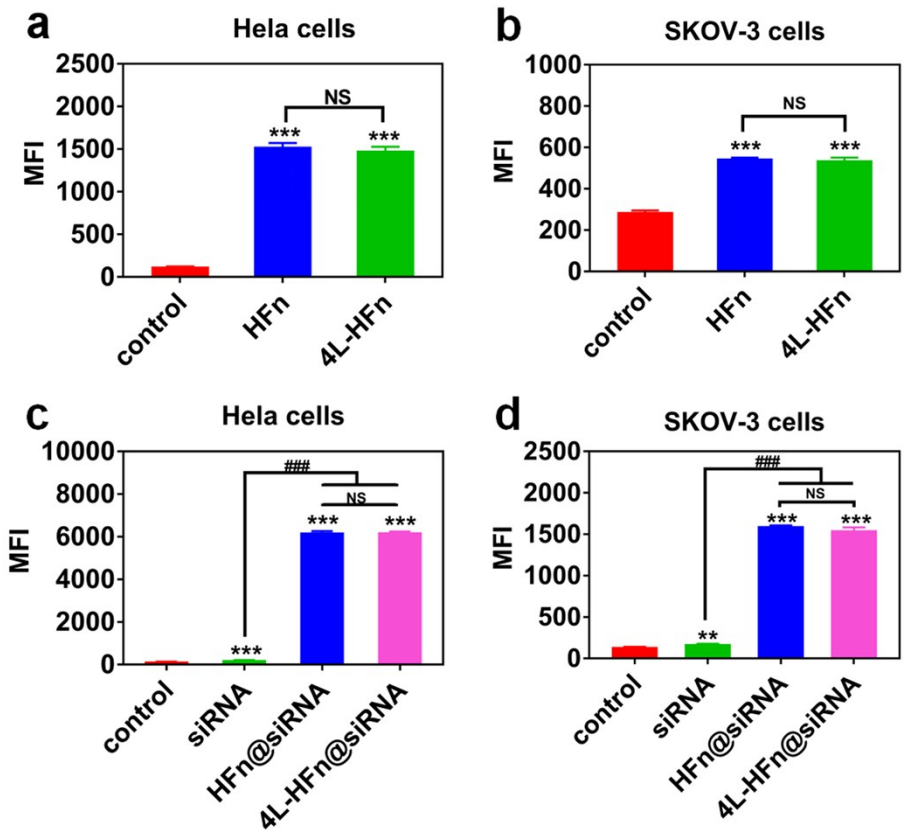

Figure S6. Cellular uptake studies of Hela and SKOV-3 cells incubated with nL-HFn and nL-HFn@siRNA nanoparticles by flow cytometry. The result analysis of average fluorescence intensity (MFI) according to Figure 5d, e, g, and h. Data represent mean ± SD (n = 3). The significance of the differences (** $p < 0.01$, *** $p < 0.001$ vs control group, ### $p < 0.001$ vs siRNA group) was evaluated by the Student's t-test.

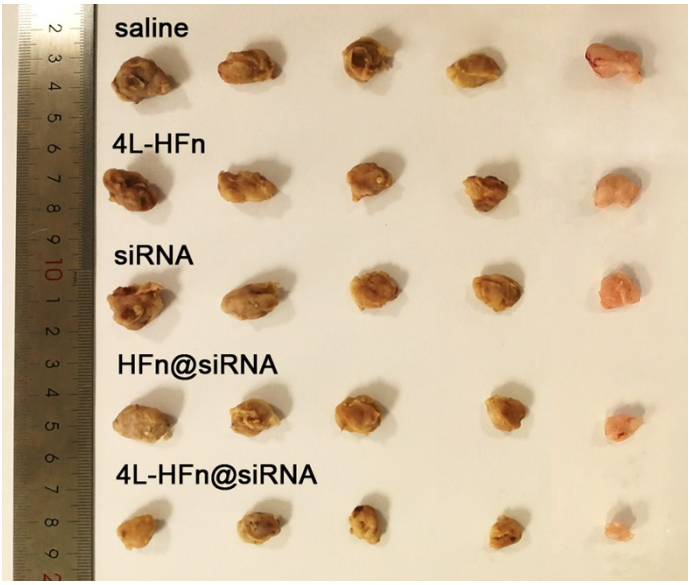

Figure S7. Photographs of tumors in different groups with saline, 4L-HFn, siRNA, HFn@siRNA and 4L-HFn@siRNA after last injection treatment (n = 5).