Electronic Supplementary Material (ESI) for Nanoscale Advances.

SUPPORTING INFORMATION

Interdependence of charge and secondary structure on cellular uptake of cell penetrating peptide functionalized silica nanoparticles

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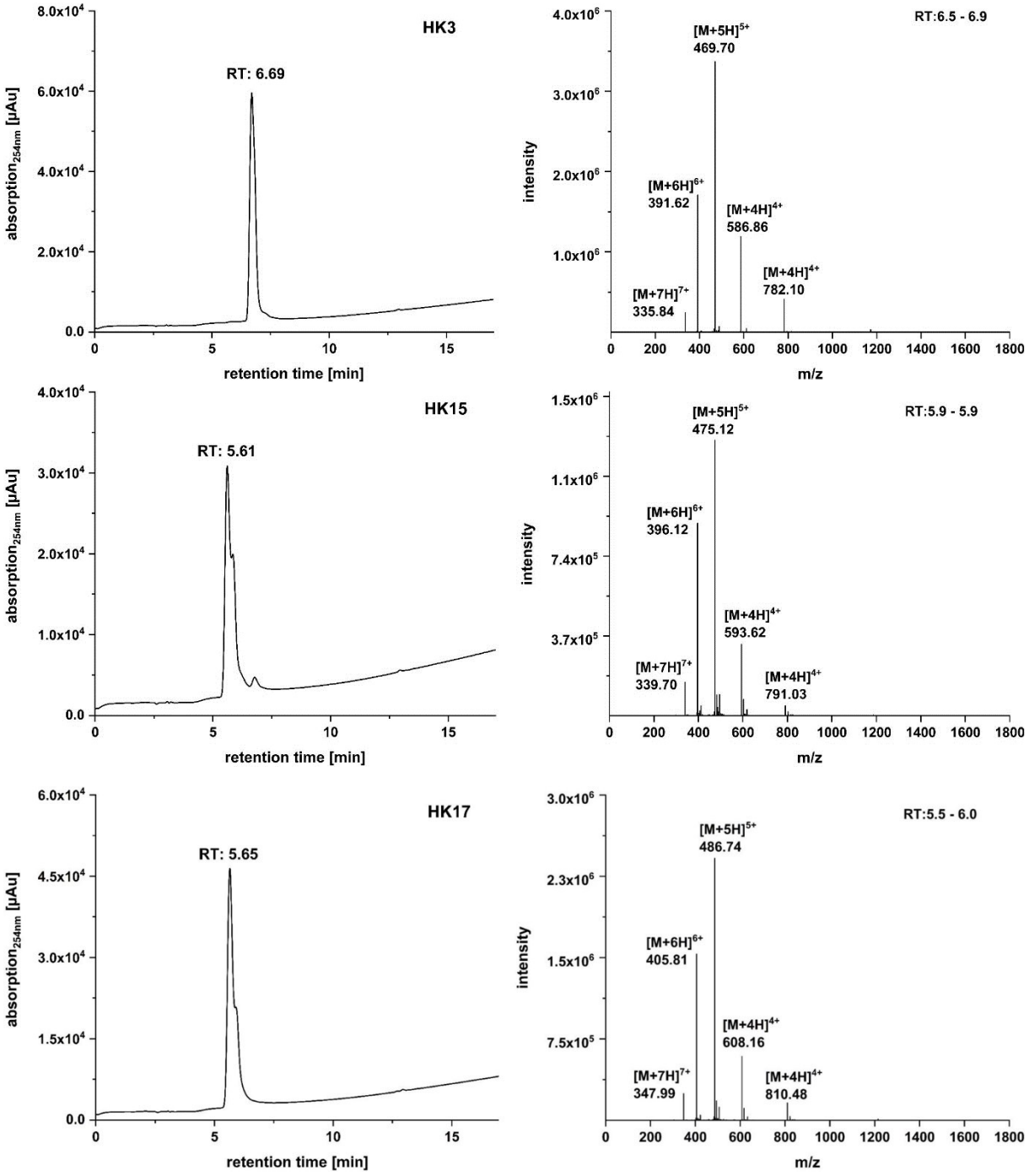

Figure S1. HPLC-ESI/MS analysis of the CF-labeled peptides HK3, HK15 and HK17. Samples were recorded using a gradient from 10 to 60% acetonitrile in water (incl. 0.1% formic acid) within 15 min.

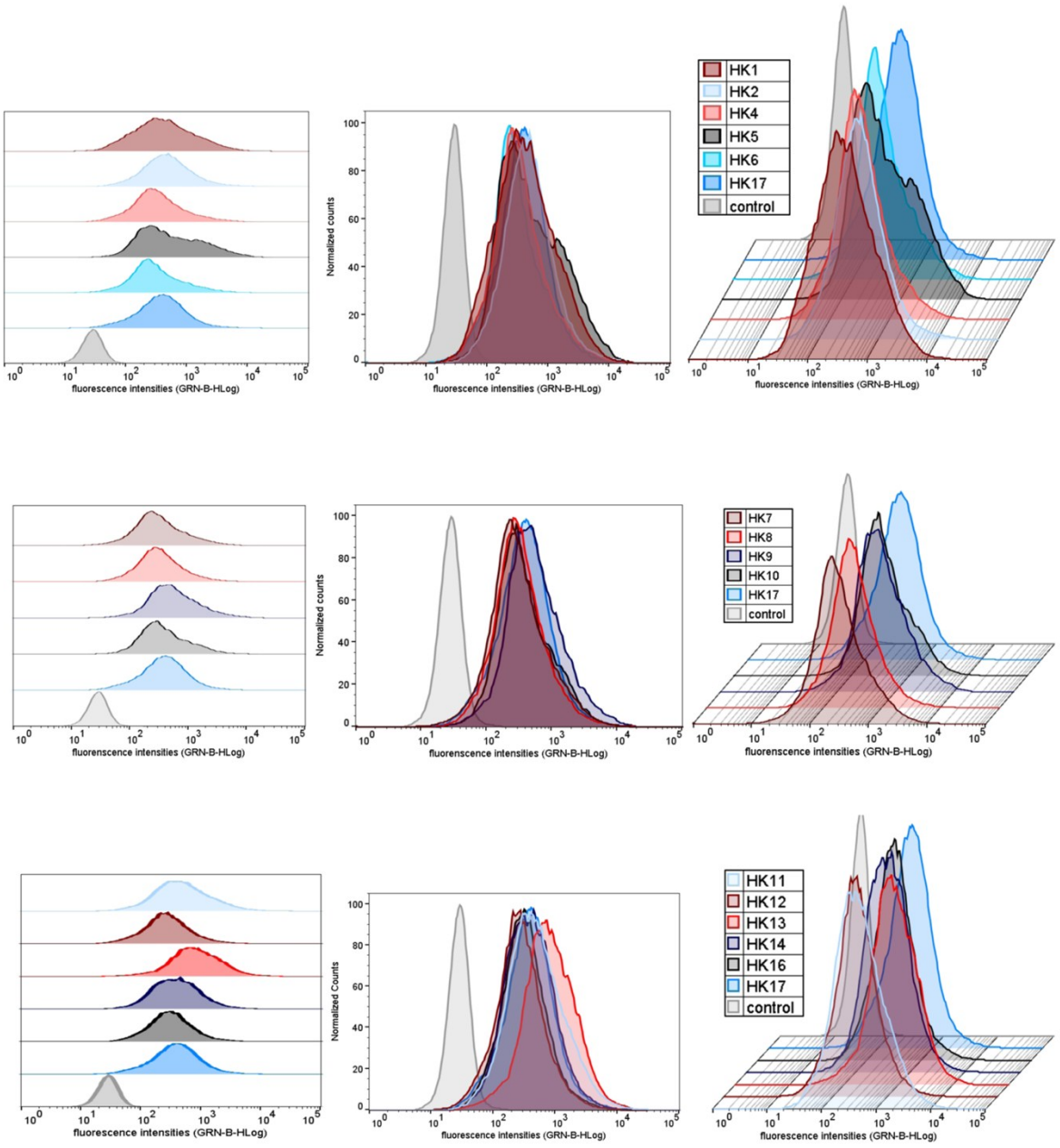

Figure S2. Flow cytometry fluorescence intensity distributions of HeLa cells treated with all peptides of the alanine-scan (data of HK3, HK15 and HK17 treated cells are depicted in the original paper).

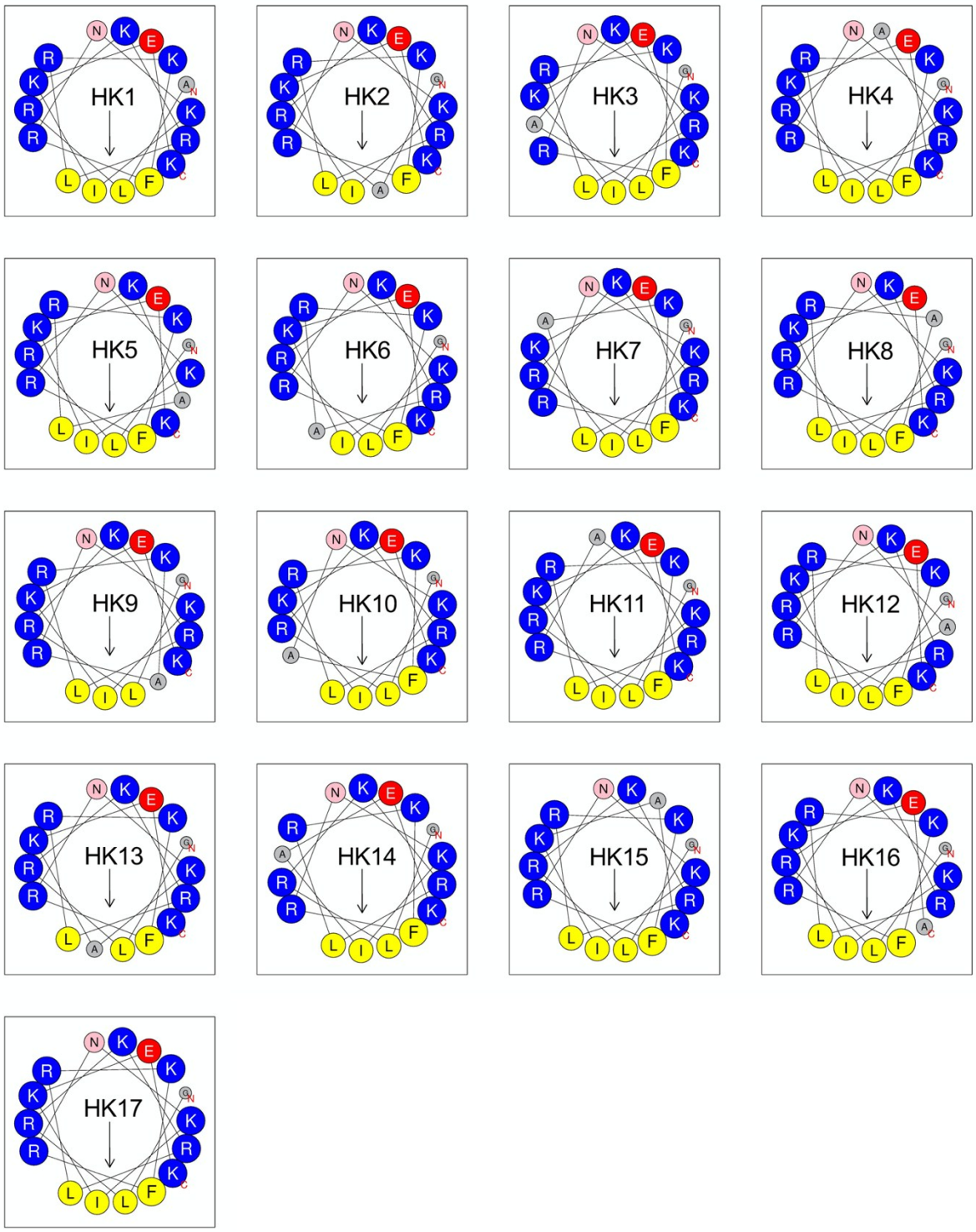

Figure S3. Helical wheel projections of all synthesized peptides. Projections were calculated by using Heliquest. (R. Gautier, D. Douguet, B. Antonny and G. Drin, *Bioinformatics*, 2008, **24**, 2101-2102)

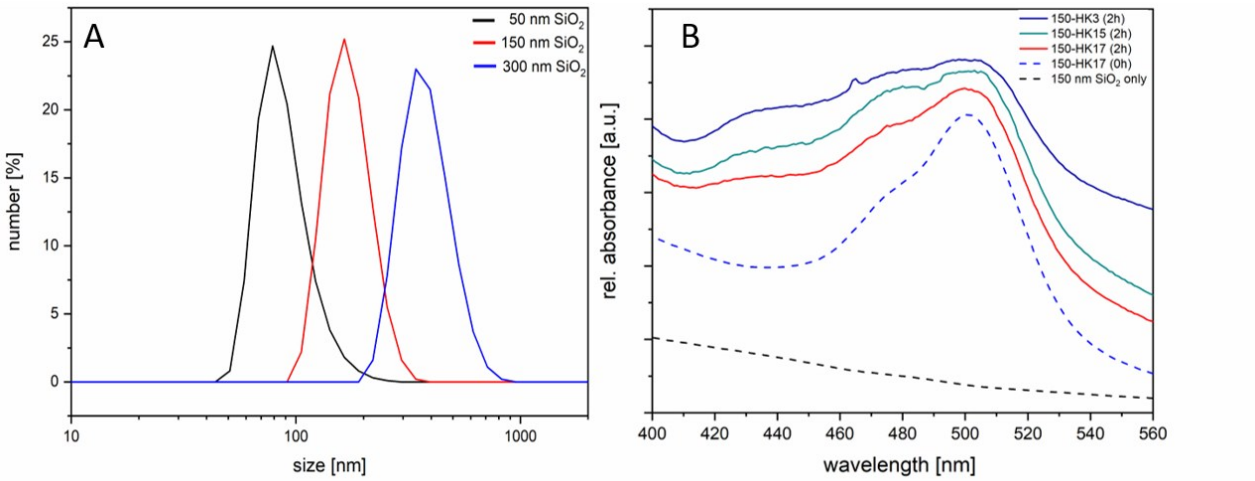

Figure S4. A Hydrodynamic radii of SiO_2 particles determined through DLS measurements. B Absorbance measurements of (CPP functionalized) silica nanoparticles in the presence of serum proteins to determine the conjugate stability. Absorbance was measured after stirring CPP functionalized silica particles for two hours in cell culture medium containing 10% FBS. For comparison, the absorbance before the addition of FBS as well as the particle absorbance only are shown. The strong absorbance of the dye labeled peptide on the surface of nanoparticles demonstrates their stability in the presence of serum proteins. All values are plotted as relative absorbances.

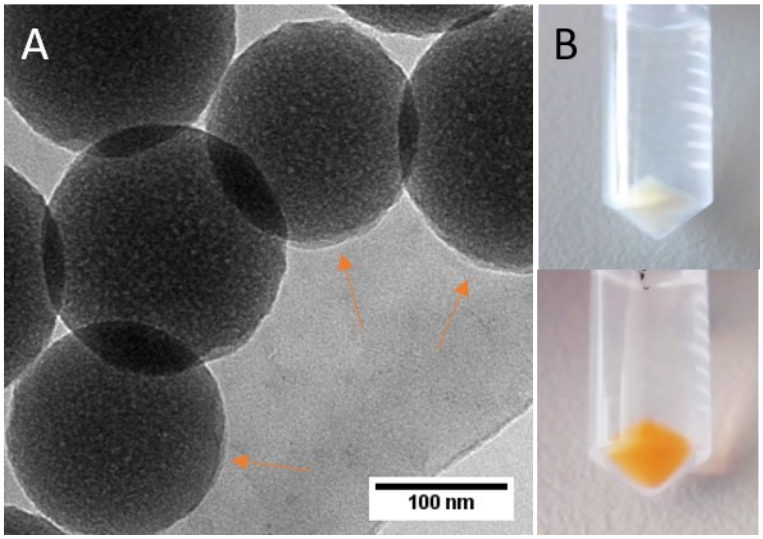

Figure S5. A TEM images of CPP functionalized silica nanoparticles. B Photographs of 150 nm silica nanoparticles before and after the attachment of CF-HK17.

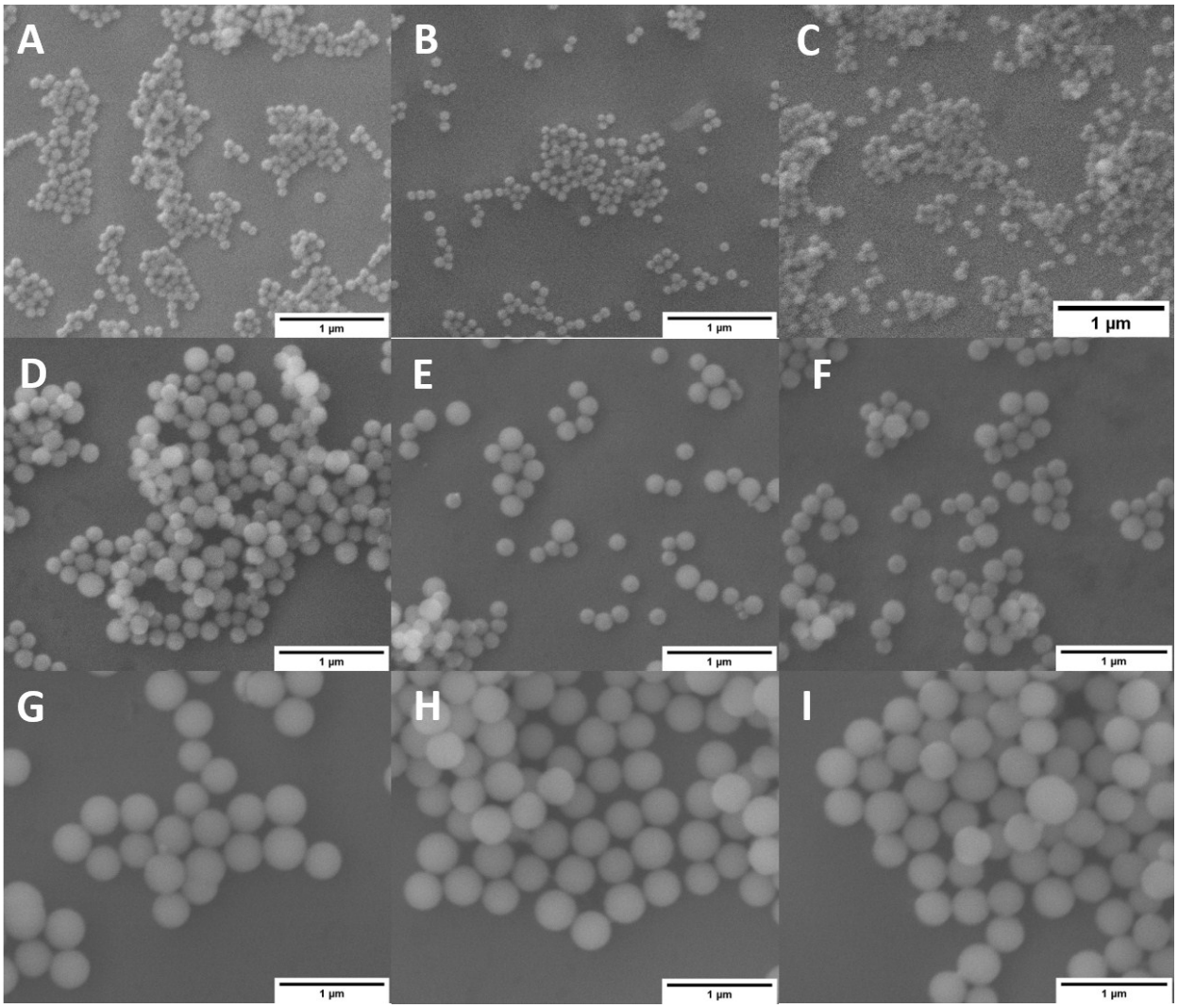

Figure S6. SEM images of CPP functionalized silica particles. A-C 50 nm SiO_2 particles functionalized with HK3, HK15 and HK17, respectively. **D-F** 150 nm SiO_2 particles functionalized with HK3, HK15 and HK17, respectively. **G-I** 300 nm SiO_2 particles functionalized with HK3, HK15 and HK17, respectively.

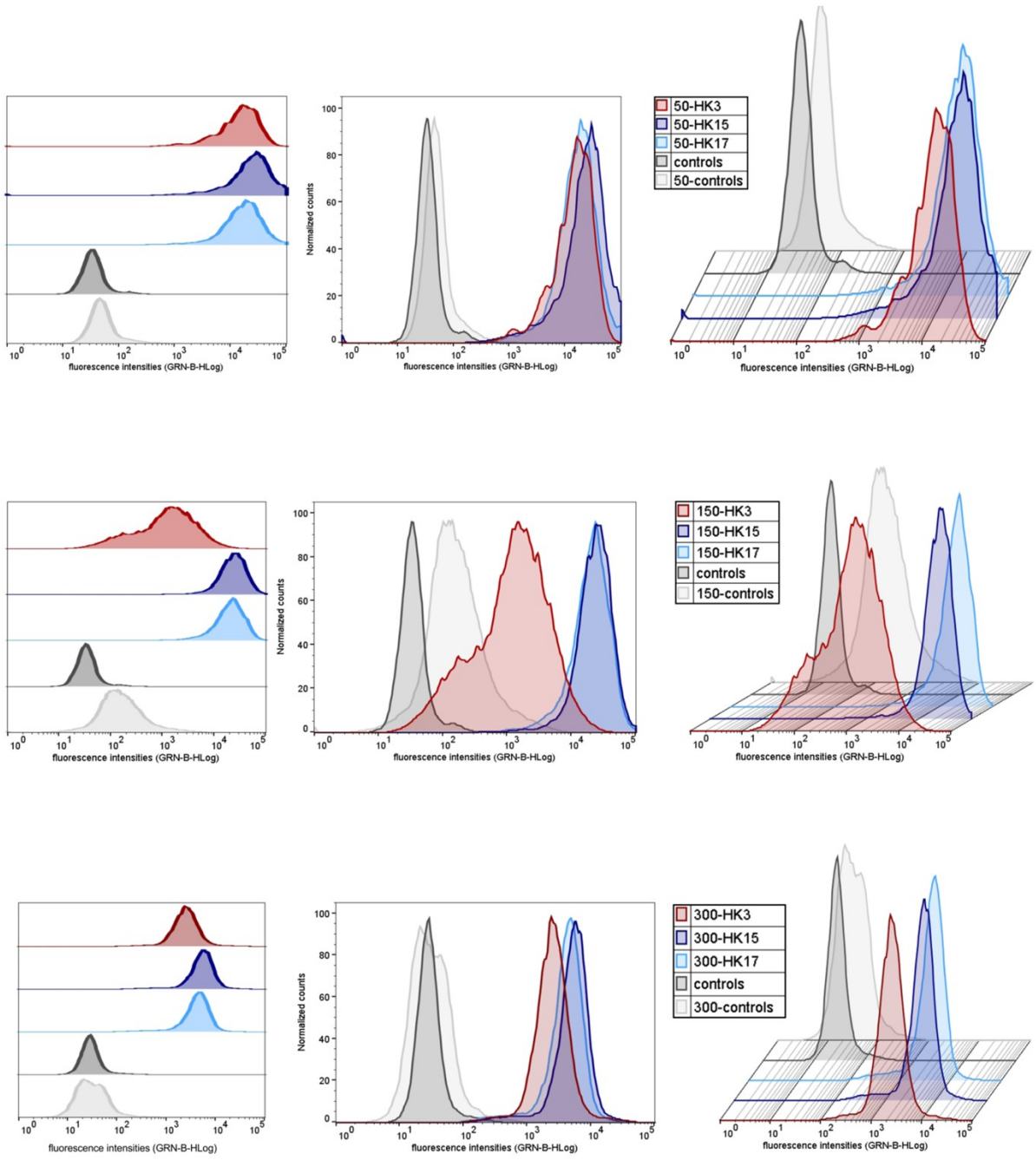

Figure S7. Flow cytometry fluorescence intensity distributions of HeLa cells treated with CPP-silica nanoparticles.

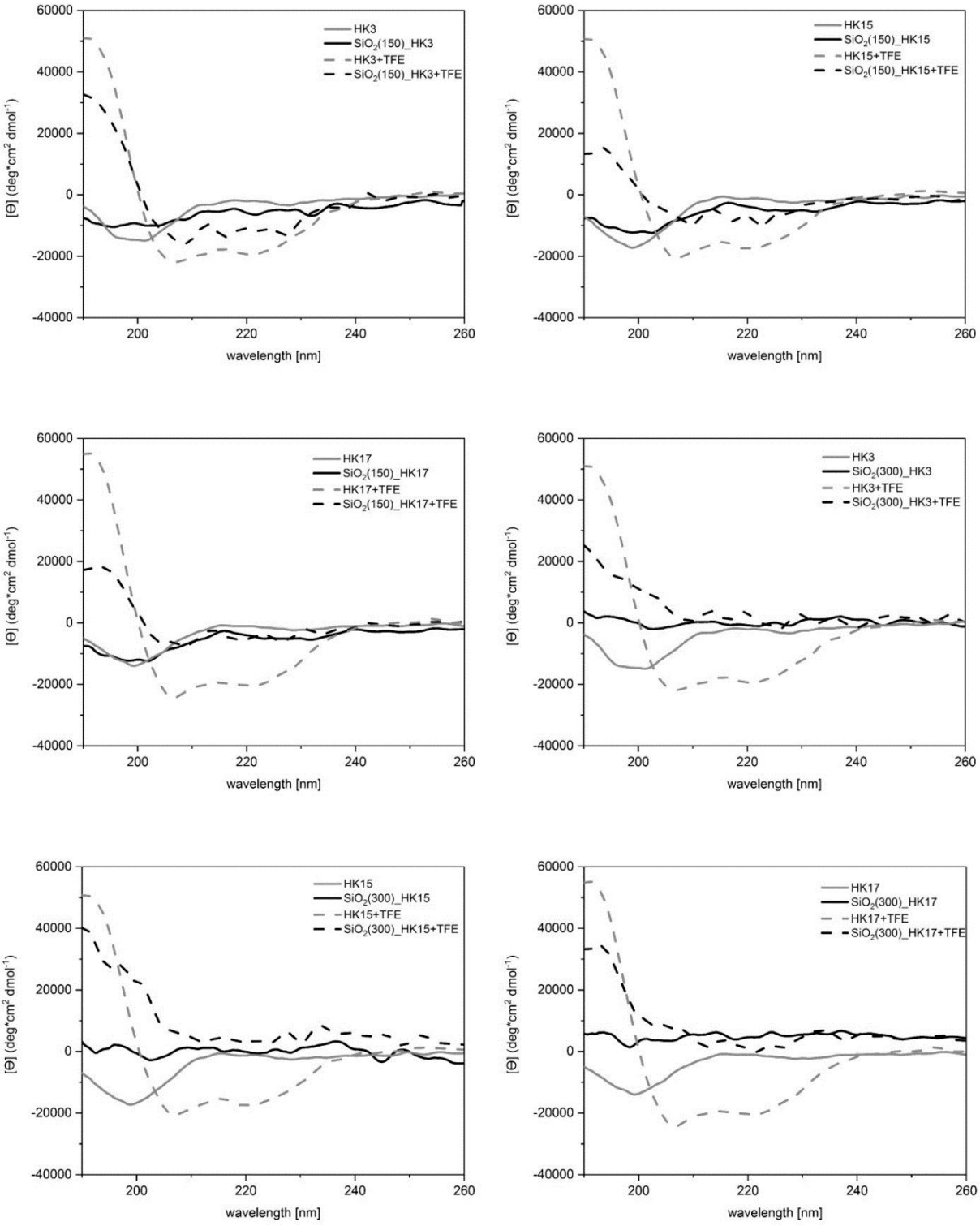

Figure S8. CD-spectra of 150nm and 300nm sized silica-peptide particles in comparison to the free peptides HK3, HK17 and HK15.