

Supporting Information

Recombinant sFRP4 bound Chitosan-Alginate Composite Nanoparticles Embedded with Silver Nanoclusters for Wnt/ β -catenin targeting in Cancer Theranostics

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Results

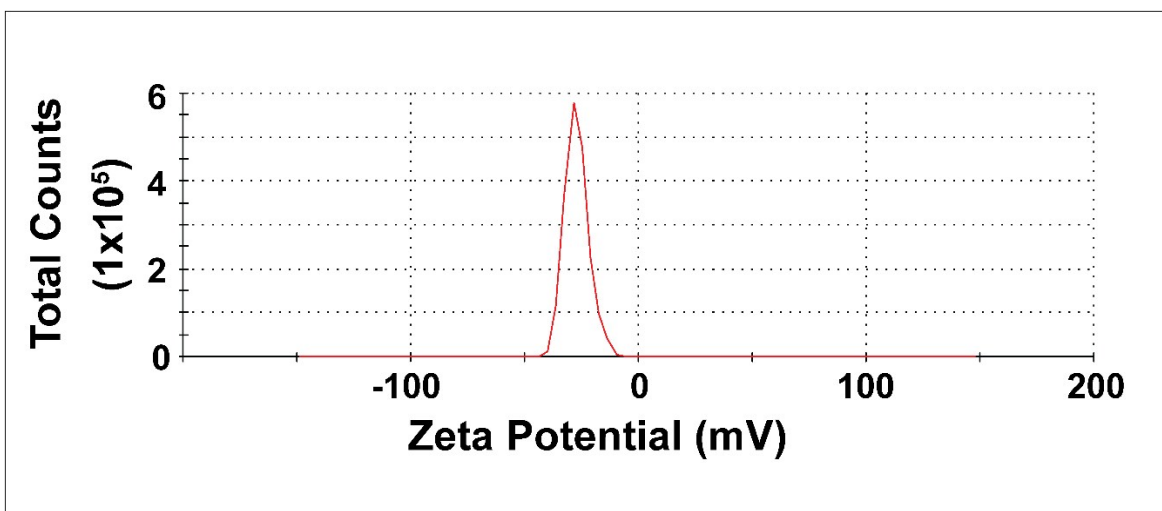


Fig. S1 Zeta potential studies of Ag NC-Chi-Alg NPs. The single peak shows that the net surface charge of the NPs was -27 mV.

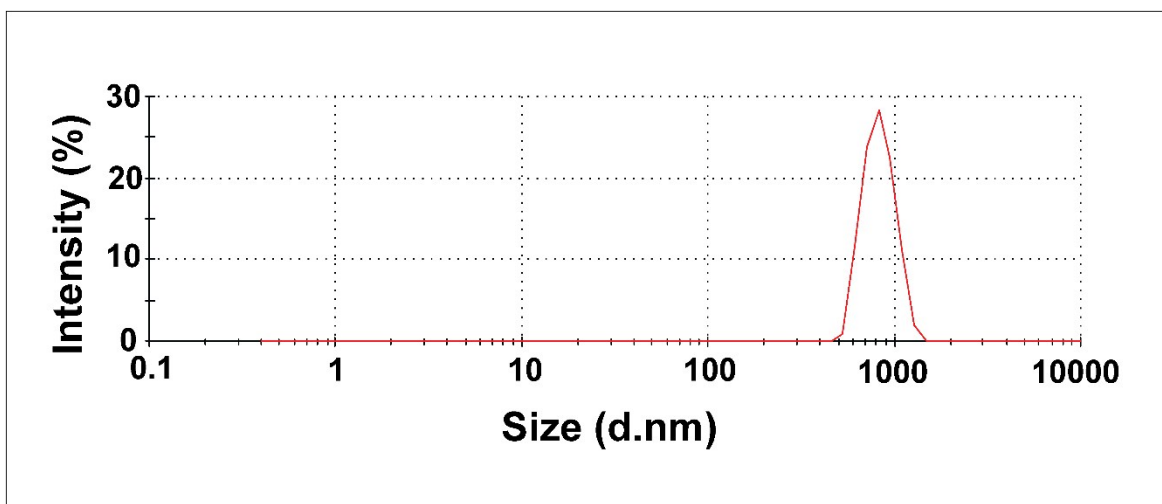


Fig. S2 Dynamic light scattering analysis of Ag NC-Chi-Alg NPs. The hydrodynamic diameter was found to be 774 nm.

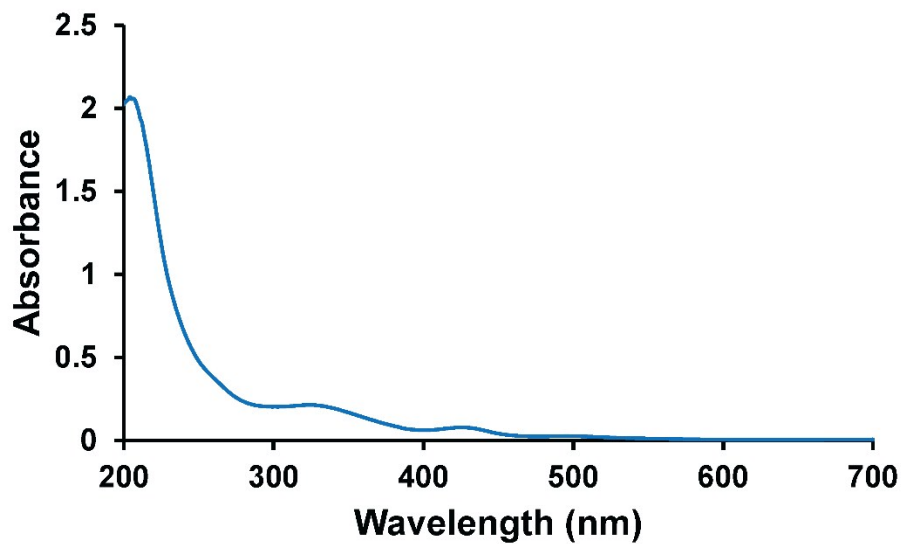


Fig. S3 UV-visible absorption spectrum of Ag NC-Chi-Alg NPs. The minor peaks at 334 nm and 432 nm were possibly due to the formation of extremely small silver nanoparticles.

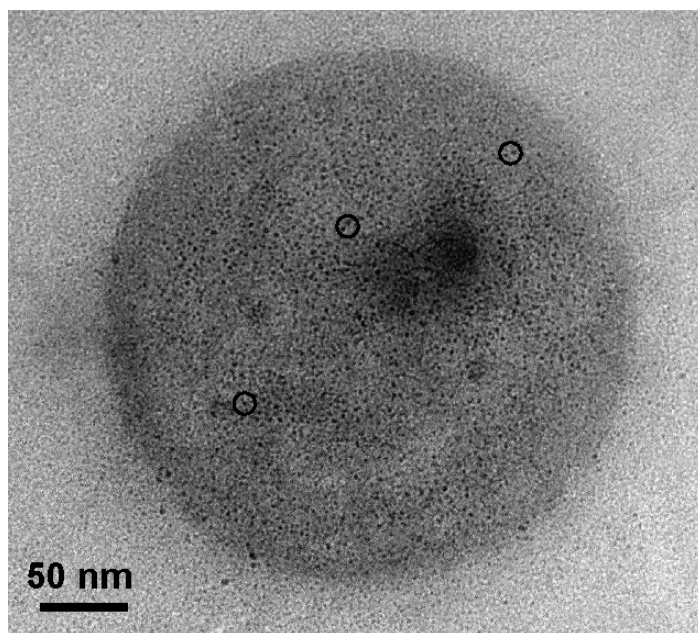


Fig. S4 TEM image of spherical NP bound to sFRP4. NPs were of approximately 350 nm in diameter, with visible Ag NCs.

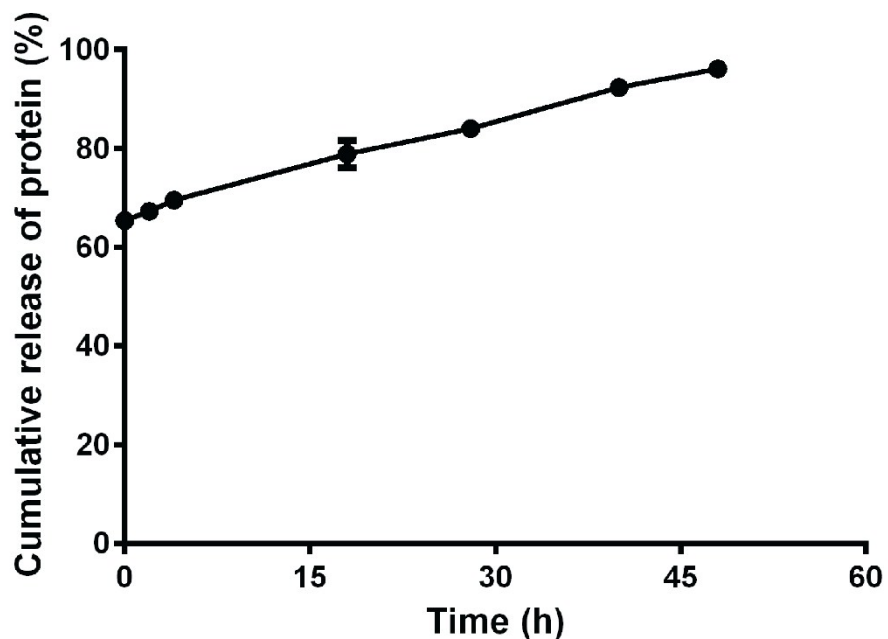


Fig. S5 Release profile of sFRP4 from NPs in PBS (pH 7.4). After 1 h of binding in Tris buffer an instantaneous release of 65% of the protein was documented, which increased upto 96% in 48 h.

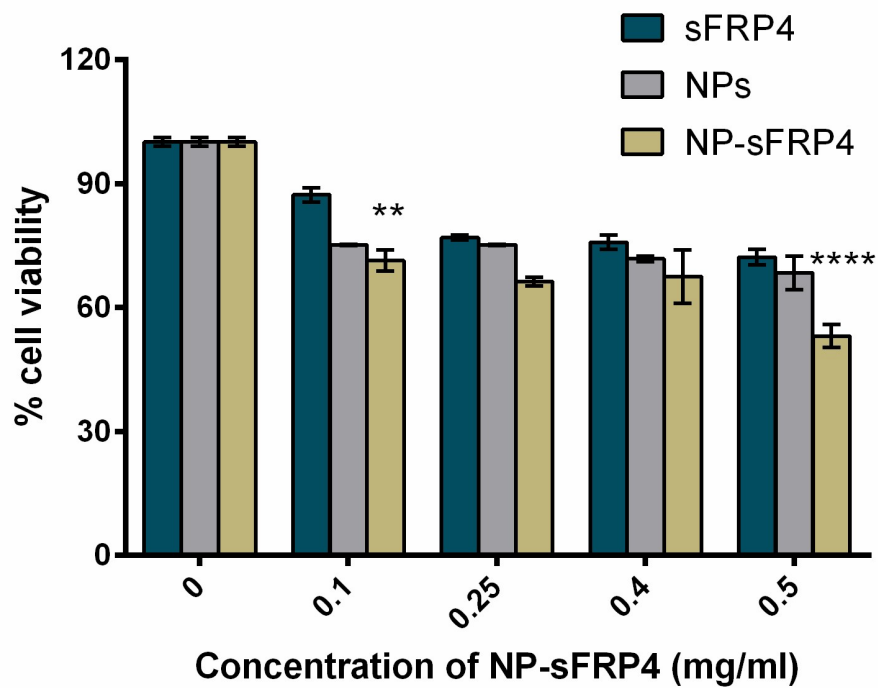


Fig. S6 MTT assay of HeLa cells treated with sFRP4, NPs, and NP-sFRP4, separately. It depicted that 0.5 mg/ml of NP-sFRP4 was sufficient to reduce viable cells to nearly 50% (** denotes p value < 0.01 and **** denotes p < 0.0001).

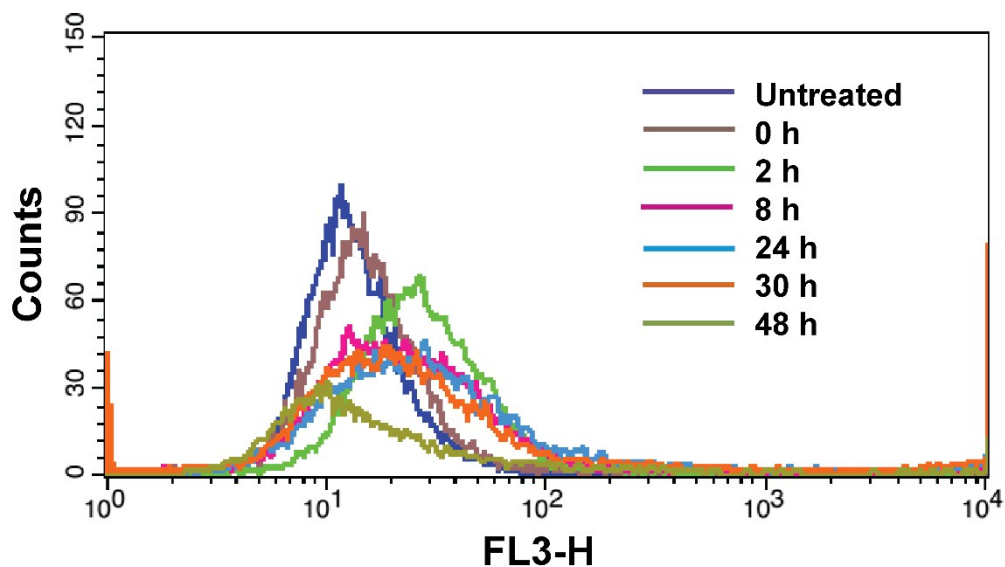


Fig. S7 Time dependent cellular uptake of luminescent NPs, as studied by flow cytometry. It showed a significant uptake of NPs in 2 h, with the luminescence lasting till 30 h. In 48 h, NPs were degraded inside the cells, as evidenced by lack of luminescence.

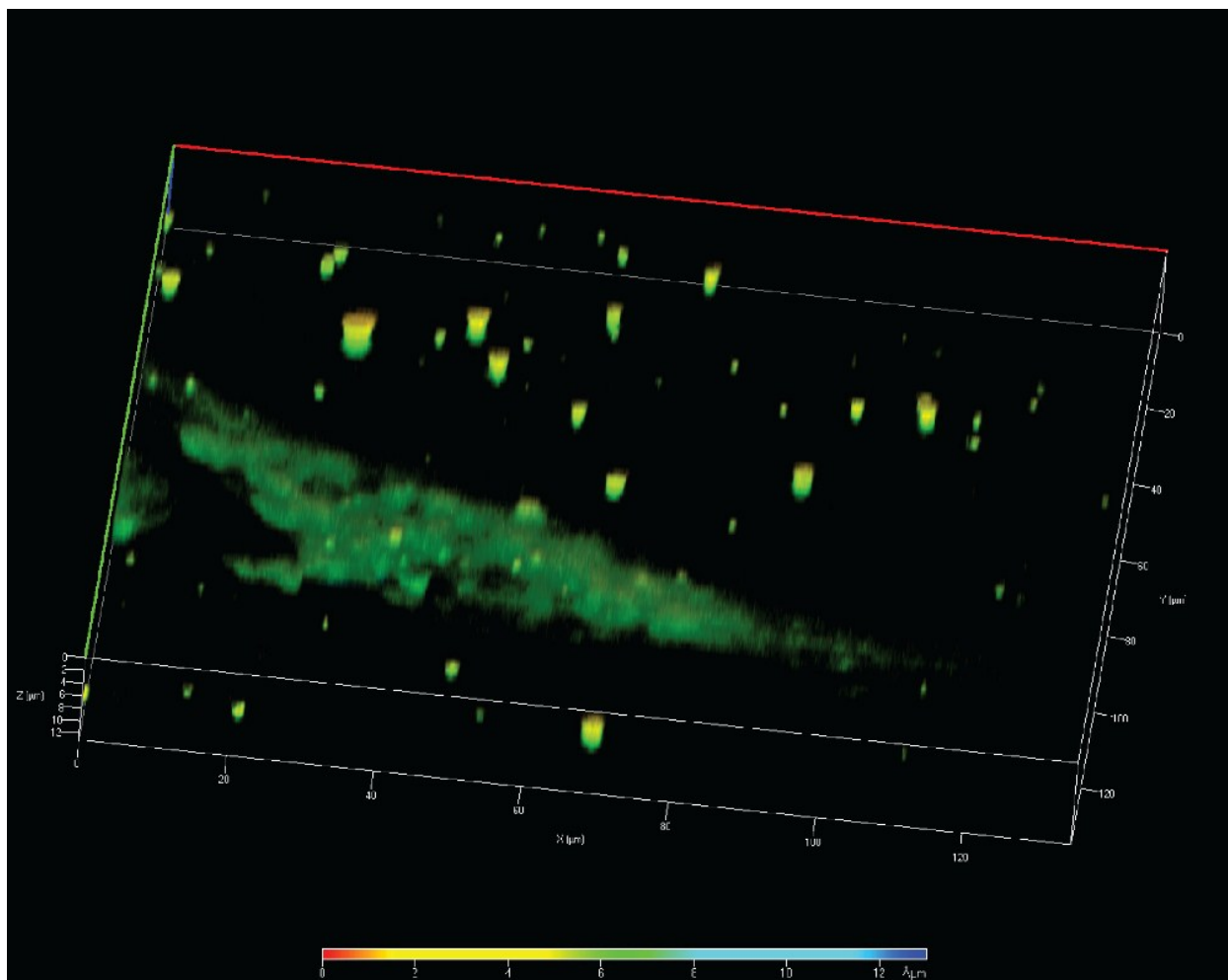


Fig. S8 Confocal microscopic projection of a 12 μm Z-stack (corresponding to Fig. 3C in the main manuscript). This image demonstrates the presence of NPs around and on the surface of the cell. The false colors depict the distance from coverslip to slide (0-12 μm), with red nearest to coverslip (top) and blue being nearest to slide (bottom). The single cell viewed in this field appears green due to uptake of luminescent NPs; green denotes that the NPs are equidistant from slide and coverslip, hence, inside the cell. However, the yellow dots are the NPs possibly on top of the cell, that is, on a different plane than the green layer, closer to the coverslip. Many NPs are also present outside the cell, as denoted by the green-yellow-brown dots.

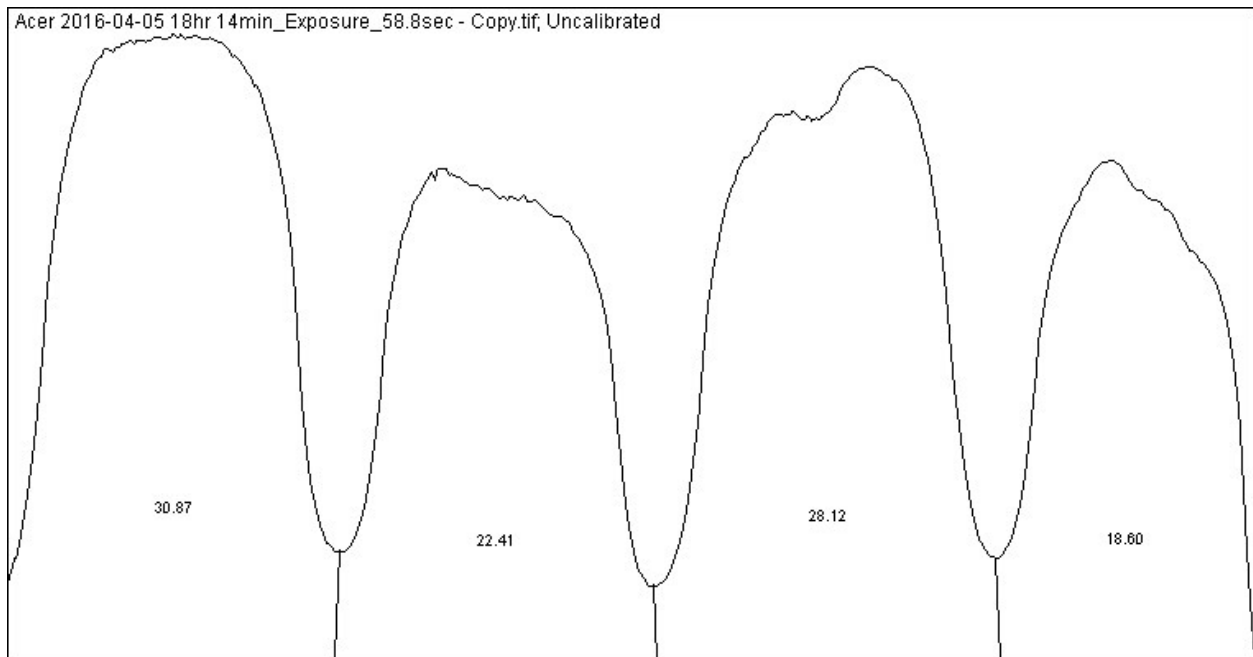


Fig. S9A Quantitative representation of β -catenin protein bands of Western blot (in Figure 4A) using ImageJ software- the four peaks from left-hand side denote the untreated, sFRP4-treated, NP-treated, and NP-sFRP4-treated populations, respectively.

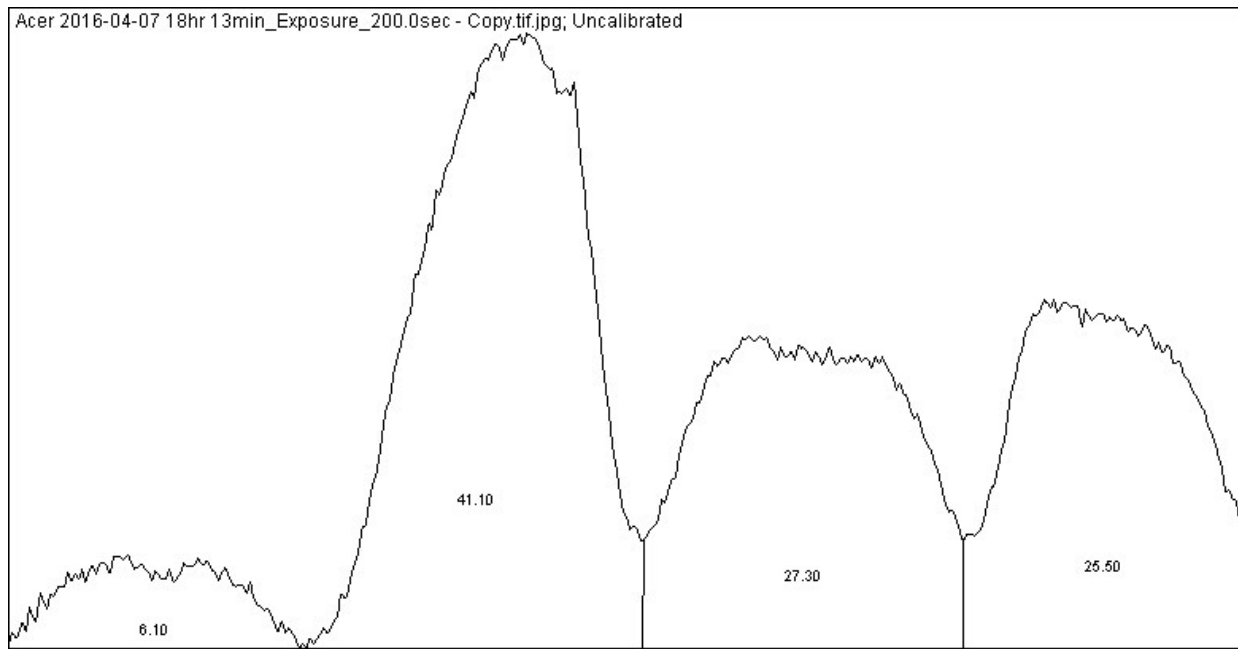


Fig. S9B Quantitative representation of phosphorylated β -catenin protein bands of Western blot (in Figure 4A) using ImageJ software- the four peaks from left-hand side denote the untreated, sFRP4-treated, NP-treated, and NP-sFRP4-treated populations, respectively.

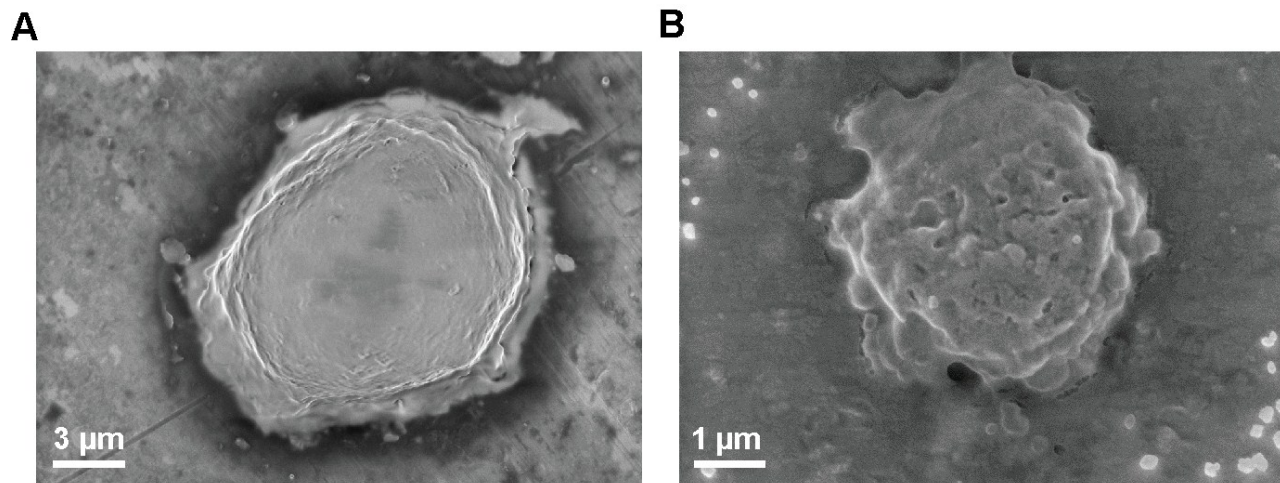


Fig. S10 FESEM images depict (A) untreated HeLa cells and (B) HeLa cells treated with NPs with 24 h.

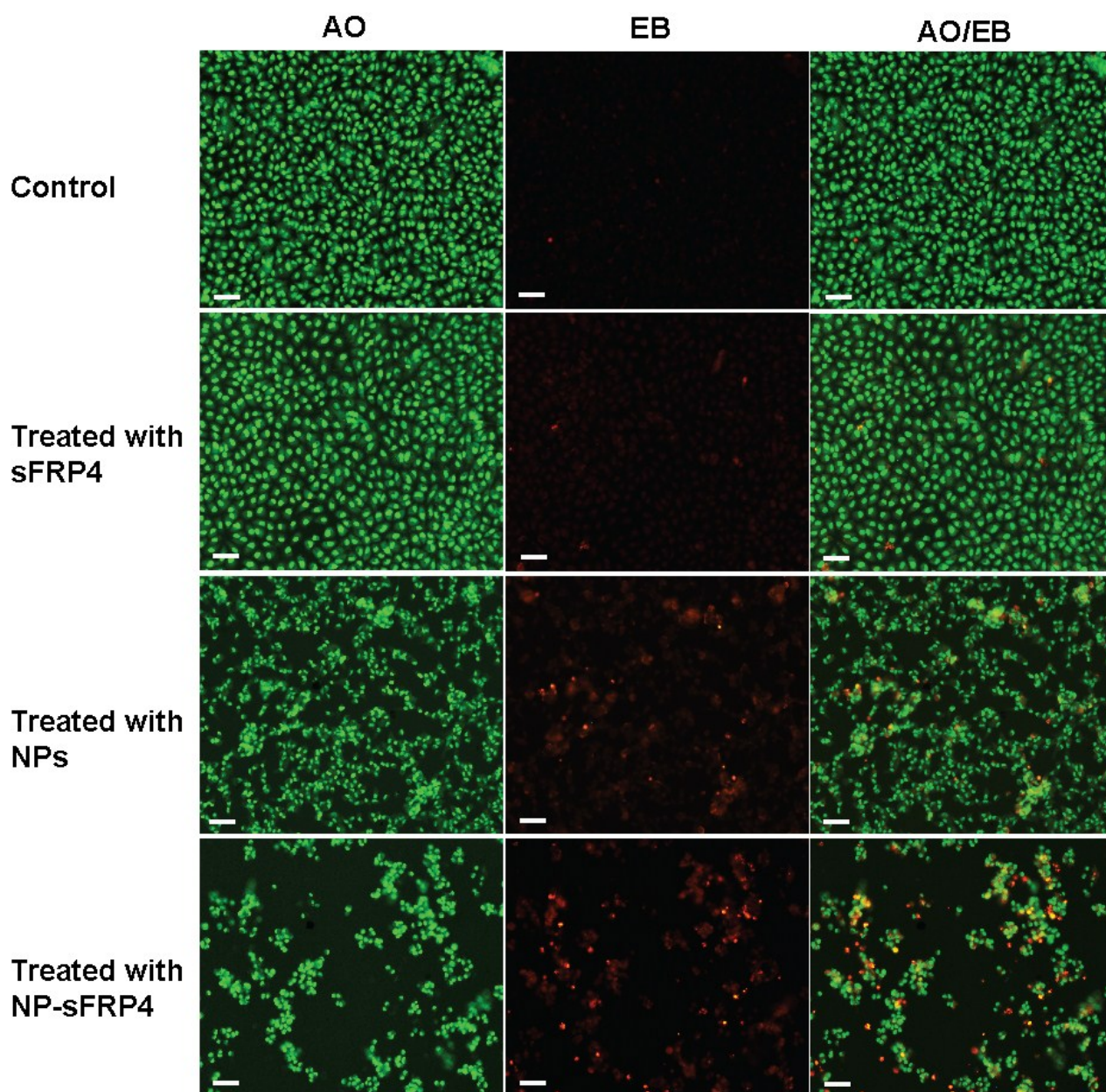


Fig. S11 Acridine orange/ ethidium bromide dual staining of control cells and cells treated with sFRP4, NPs, and NP-sFRP4, respectively. Scale bar represents 100 μm .