

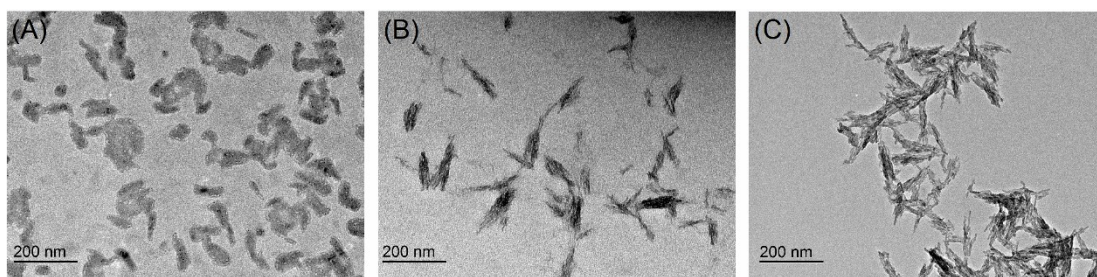
## Supplementary Information

### **Hyaluronan-Directed Fabrication of co-doped Hydroxyapatite as a Dual-Modal Probe for Tumor-specific Bioimaging**

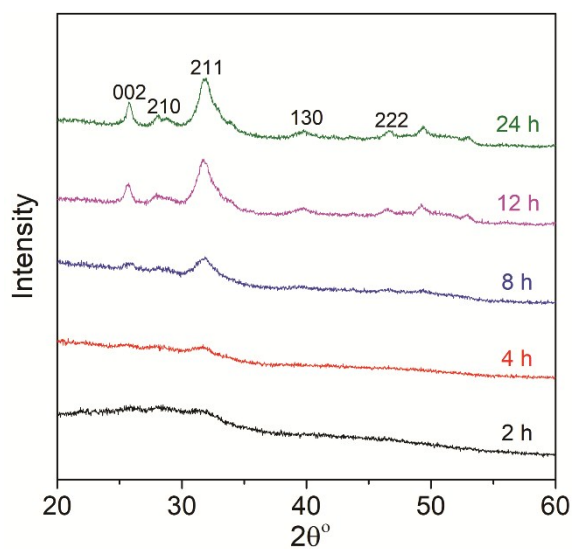
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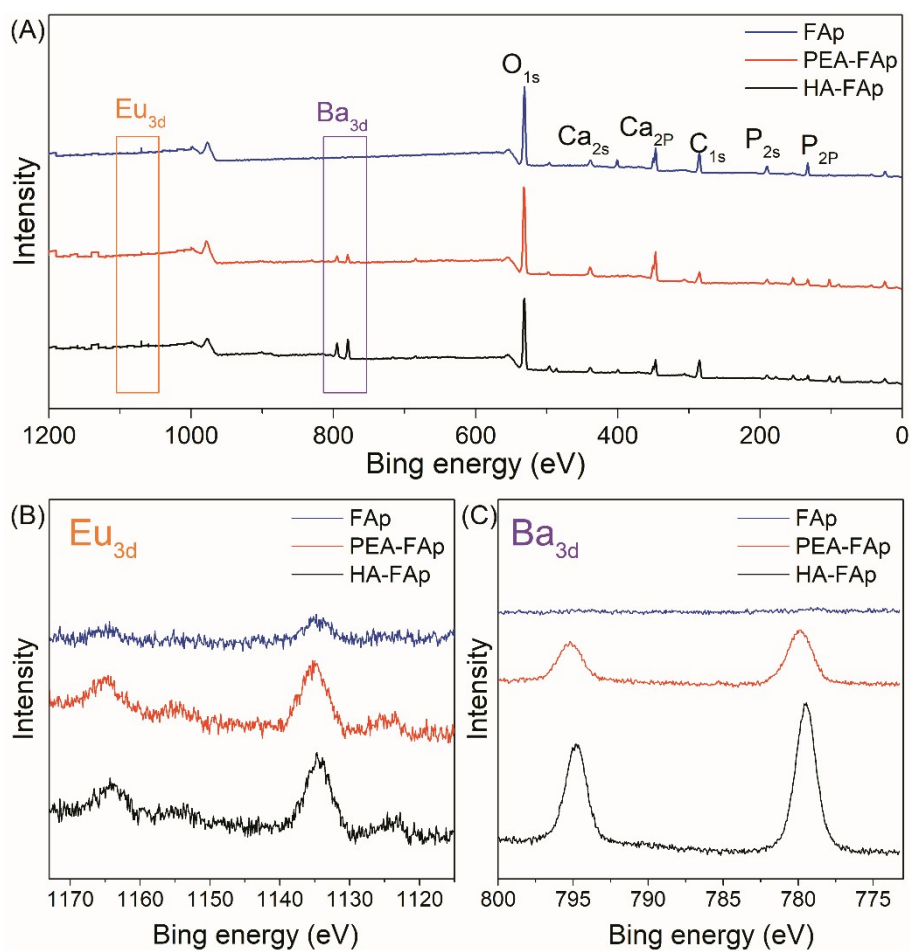
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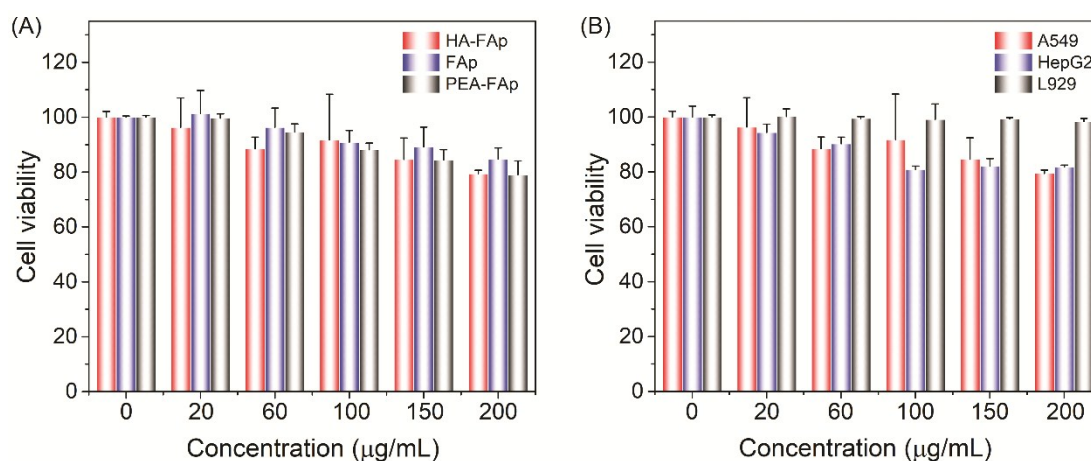
**Fig. S1** Effect of hyaluronan concentration on the morphology of HA@nFAP:Eu/Ba: (A) HA/Ca=1.65; (B) HA/Ca=3.3; (C) HA/Ca=4.95.



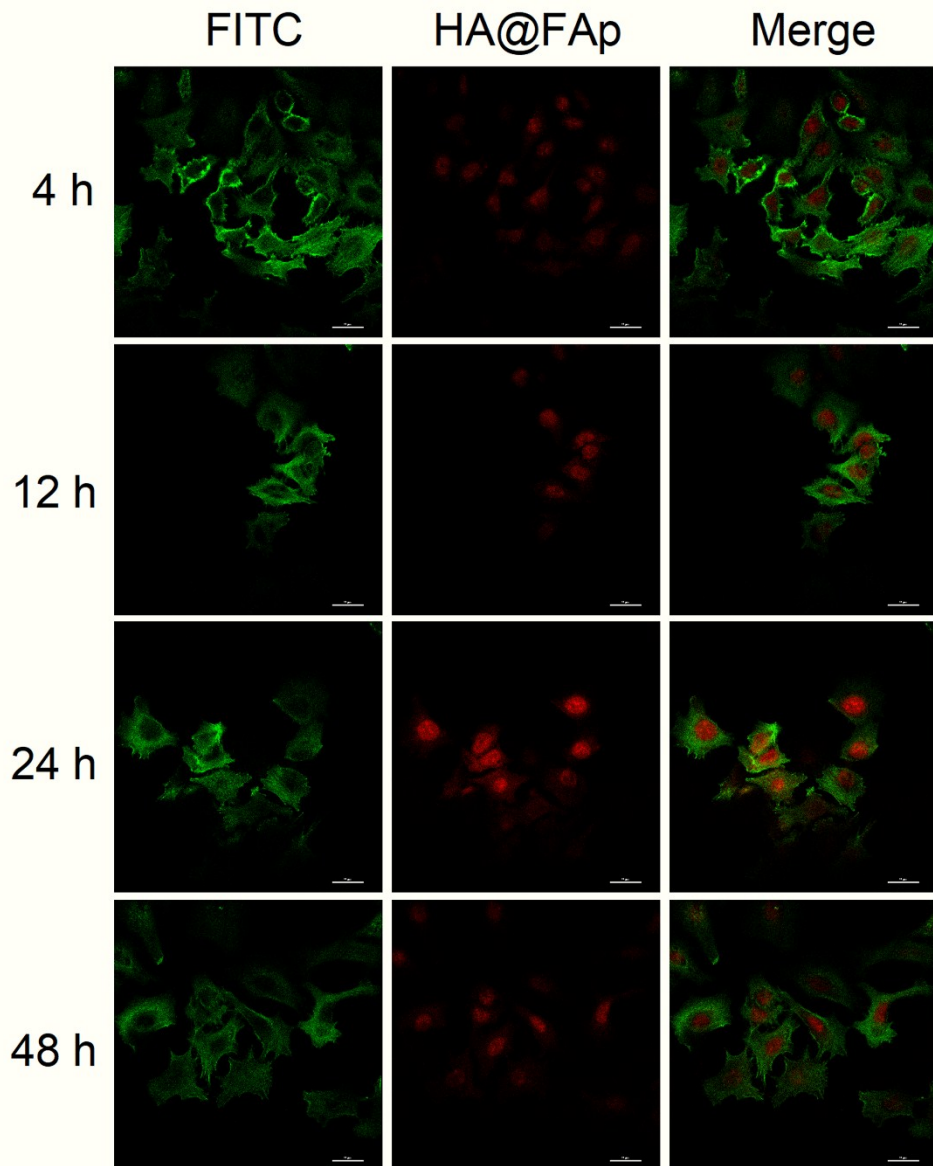
**Fig. S2** XRD patterns of the HA@nFAP:Eu/Ba prepared at different time.



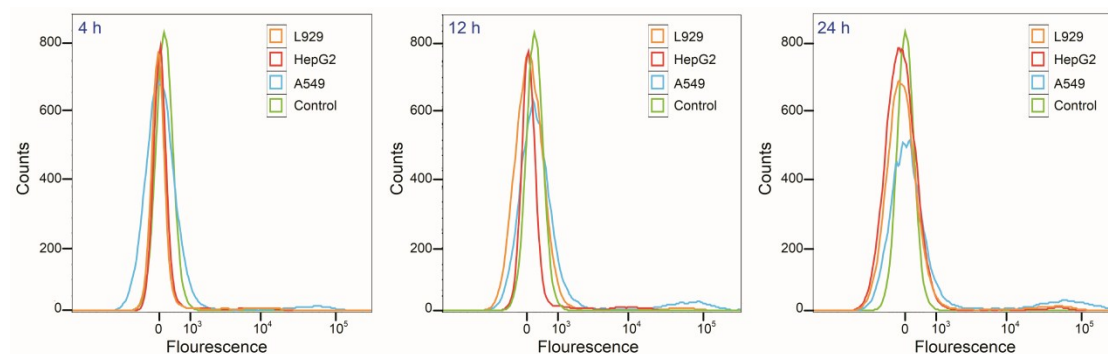
**Fig. S3** XPS patterns of the three co-doped nFap nanoparticles: (A) the whole spectrum; (B) Eu<sub>3d</sub>; (C) Ba<sub>3d</sub>.



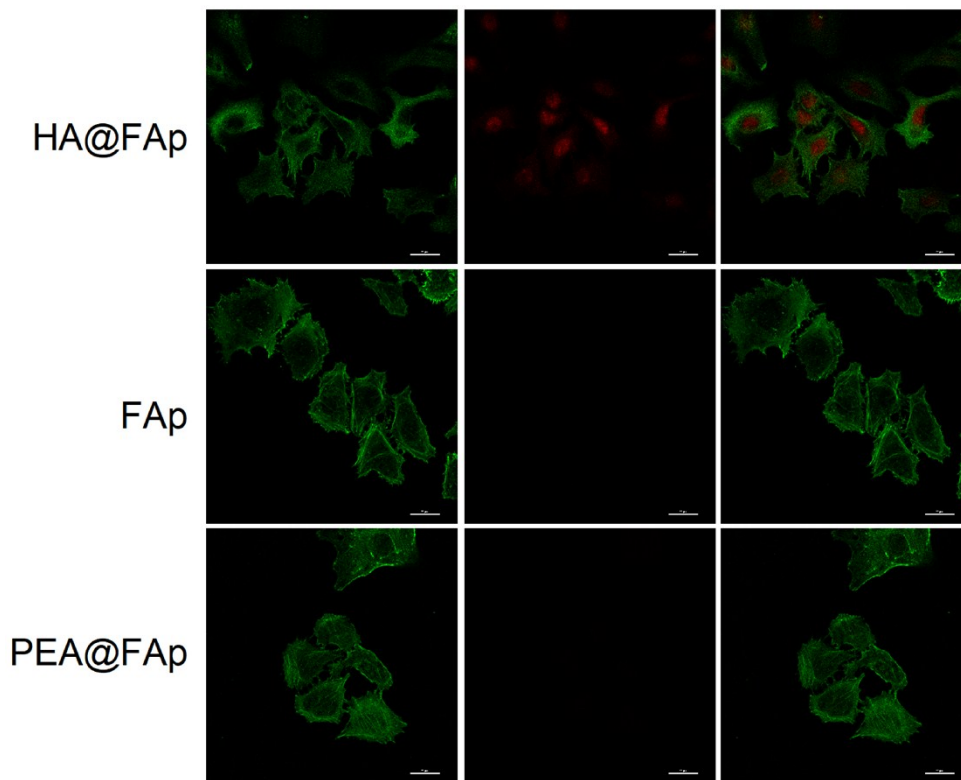
**Fig. S4** (A) CCK-8 examinations of A549 cells cultured with HA@free nFap:Eu/Ba, HA-free nFap:Eu/Ba and PEA@ nFap:Eu/Ba NPs for 48 h at 37 °C and (B) different kinds of cells cultured with HA@free nFap:Eu/Ba for 48 h at 37 °C.



**Fig. S5** CLSM images of the HA@nFap:Eu/Ba NPs incubation with A549 cells for different time.



**Fig. S6** Cellular uptake of the HA@nFap:Eu/Ba NPs in different kind of cells studied by flow cytometry.



**Fig. S7** CLSM images of the three co-doped nFAp NPs incubation with A549 cells.