Supporting Information

Upconversion and NIR II luminescent rare earth nanoparticles combined with machine learning for cancer theranostics

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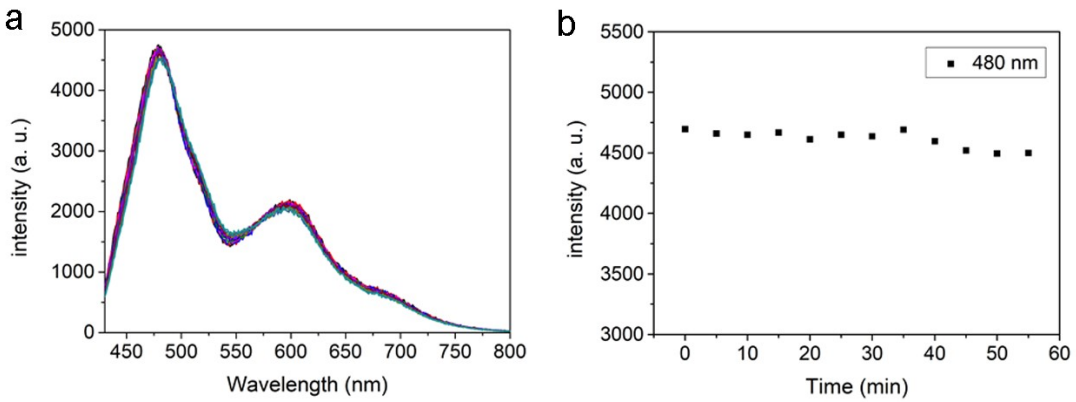

Fig. S1. (a) Fluorescence spectrum of anthocyanin irradiated with laser continuously for 1 h. (b) Fluorescence intensity of anthocyanin at 408 nm with laser irradiation for different times.

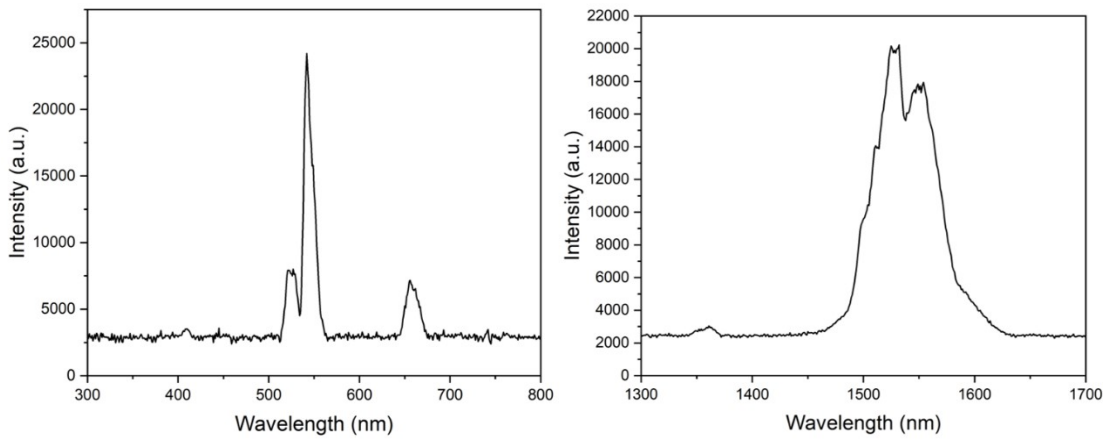

Fig. S2. NIR II luminescence spectra of RENPs.

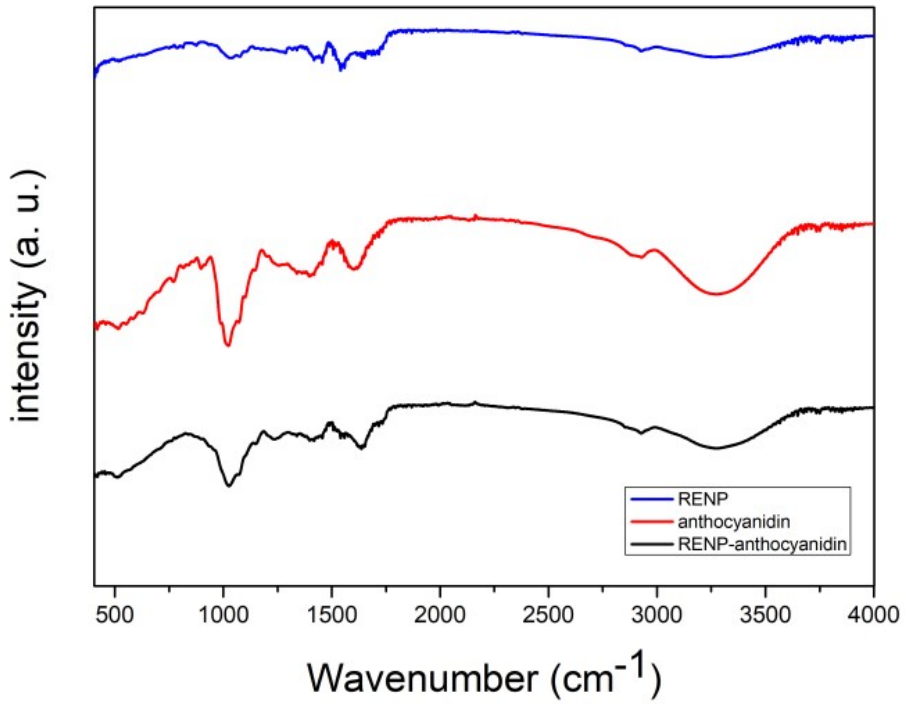

Fig. S3. FTIR spectra of RENPs, anthocyanin, anthocyanin-RENPs.

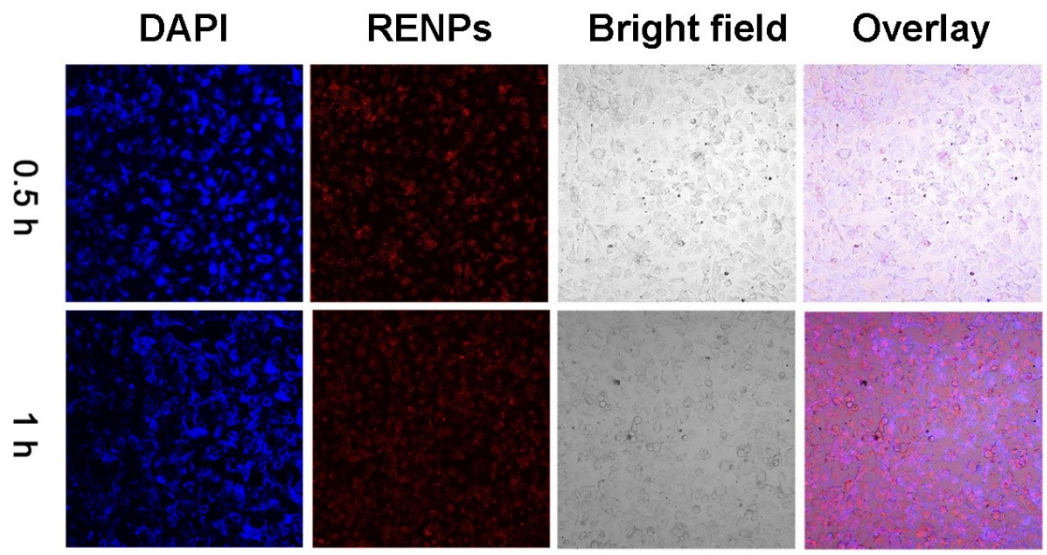

Fig. S4. Confocal images of RENPs incubated with cancer cells at different time points.

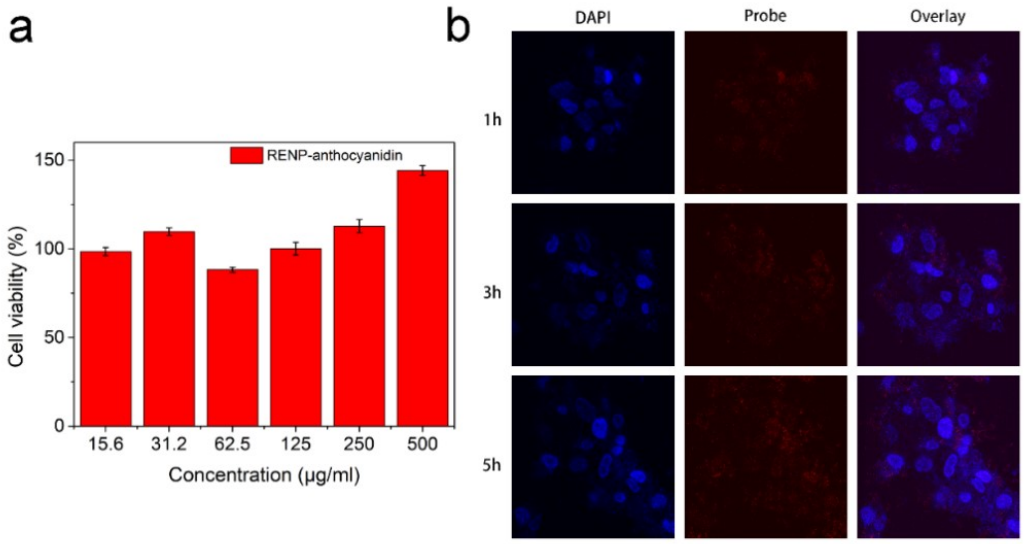

Fig. S5. (a) Cell viability of cells incubated with different concentrations of anthocyanin-RENPs at 37 °C for 24 h. (b) Confocal images of anthocyanin-RENPs incubated with cancer cells at different time points.

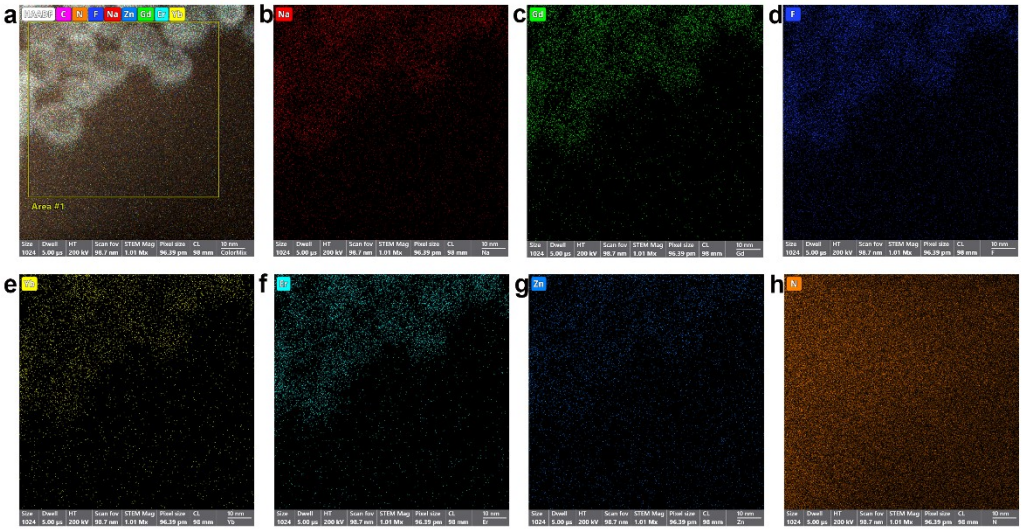

Fig. S6. Distribution of elements taken under STEM.

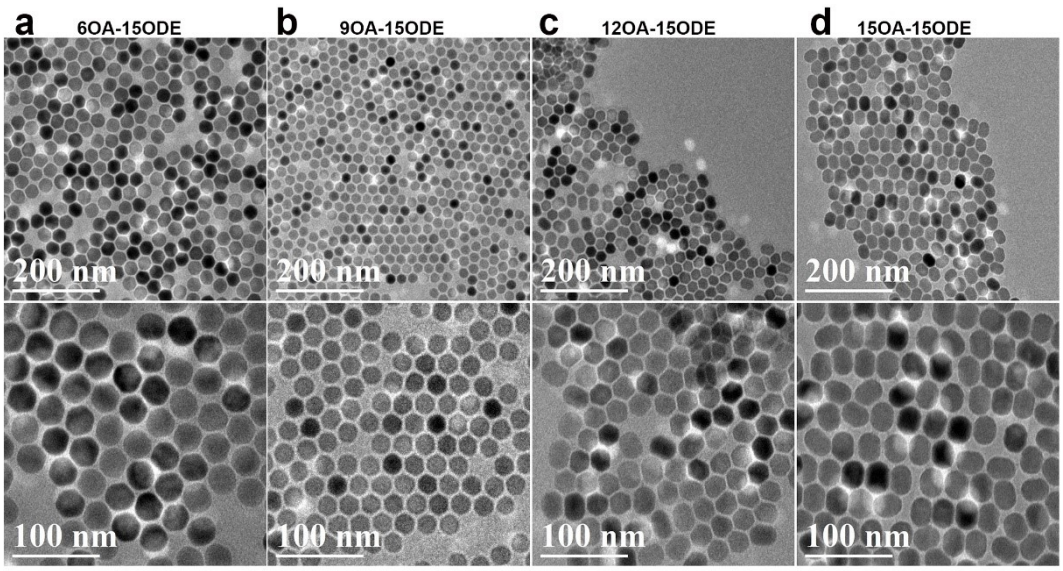

Fig. S7. TEM images of RENPs with different volume ratios of OA and ODE.

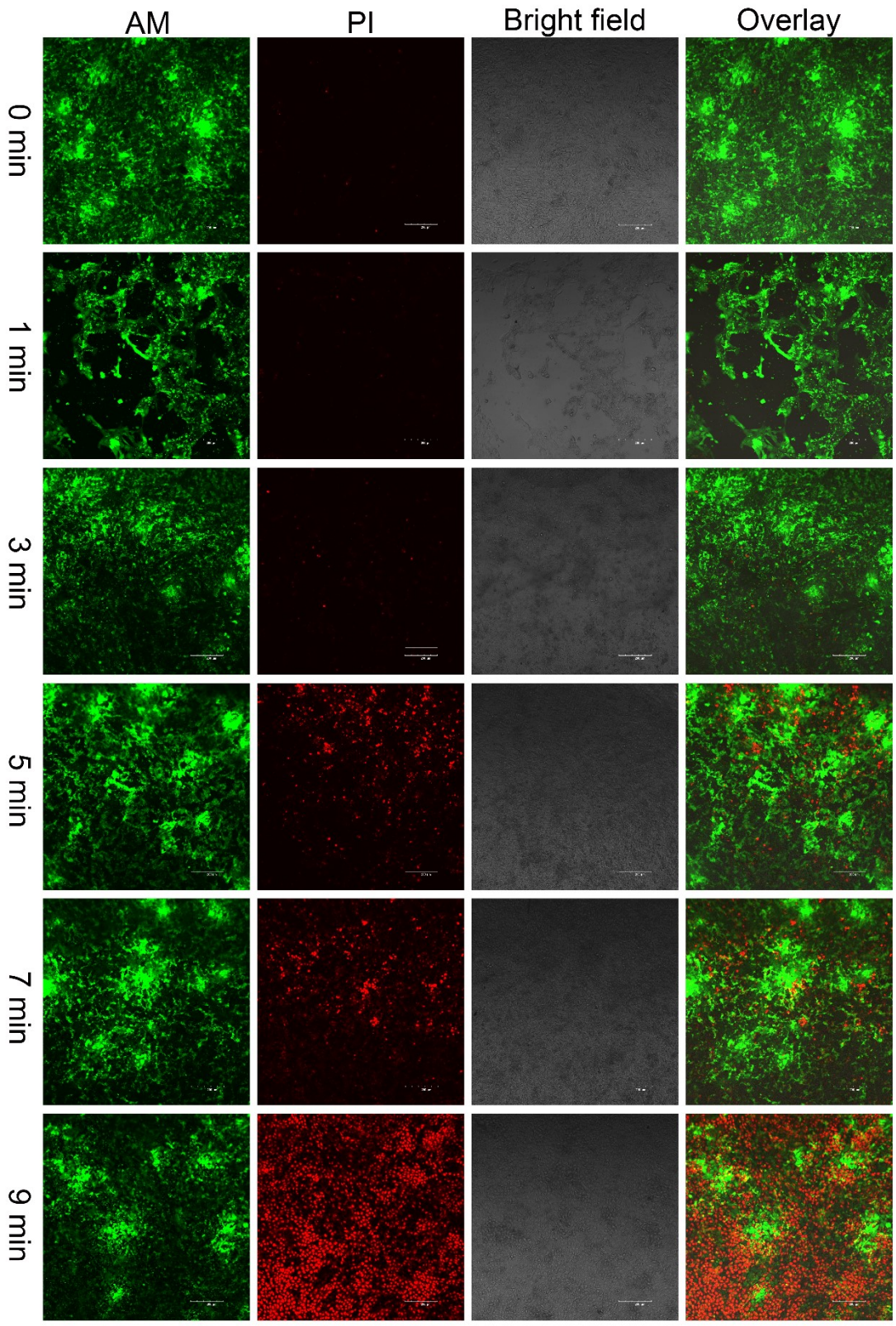

Fig. S8. The toxicity of RENP under different light conditions in vitro. From left to right, they are AM stained, PI stained, bright and overlay images. From up to down, they are different field images irradiated by 980 nm for 0-9 min.

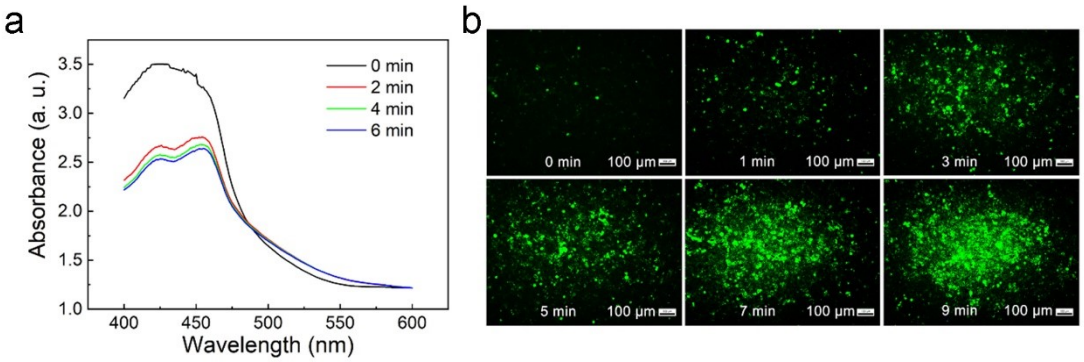

Fig. S9 (a) ROS production in aqueous solution of RENPs-ZnPc. (b) DCFH-DA luminescence microscopy images to reflect the singlet oxygen production of RENPs-ZnPc incubated cells irradiated by 980 nm laser.

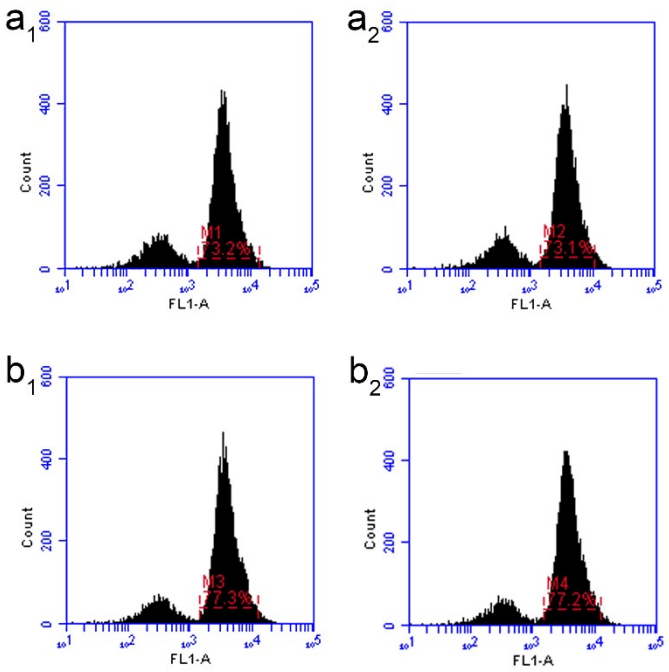

Fig. S10. Quantitative detection of ROS stained with DCFH-DA using flow cytometry at different times *in vitro*. At 5 minutes, the proportion of cells located at the main peak of the FLS-1 (green) channel was 73.2% and 73.1%, respectively, and the average fluorescence intensity of all cells was 3472.69 and 3525.37 (a1-a2). At 7 minutes, the proportion of cells located at the main peak of the FLS-1 channel was 73.2% and 73.1%, respectively, and the average fluorescence intensity of all cells was 3800.44 and 3933.41 (b1-b2).