Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting information

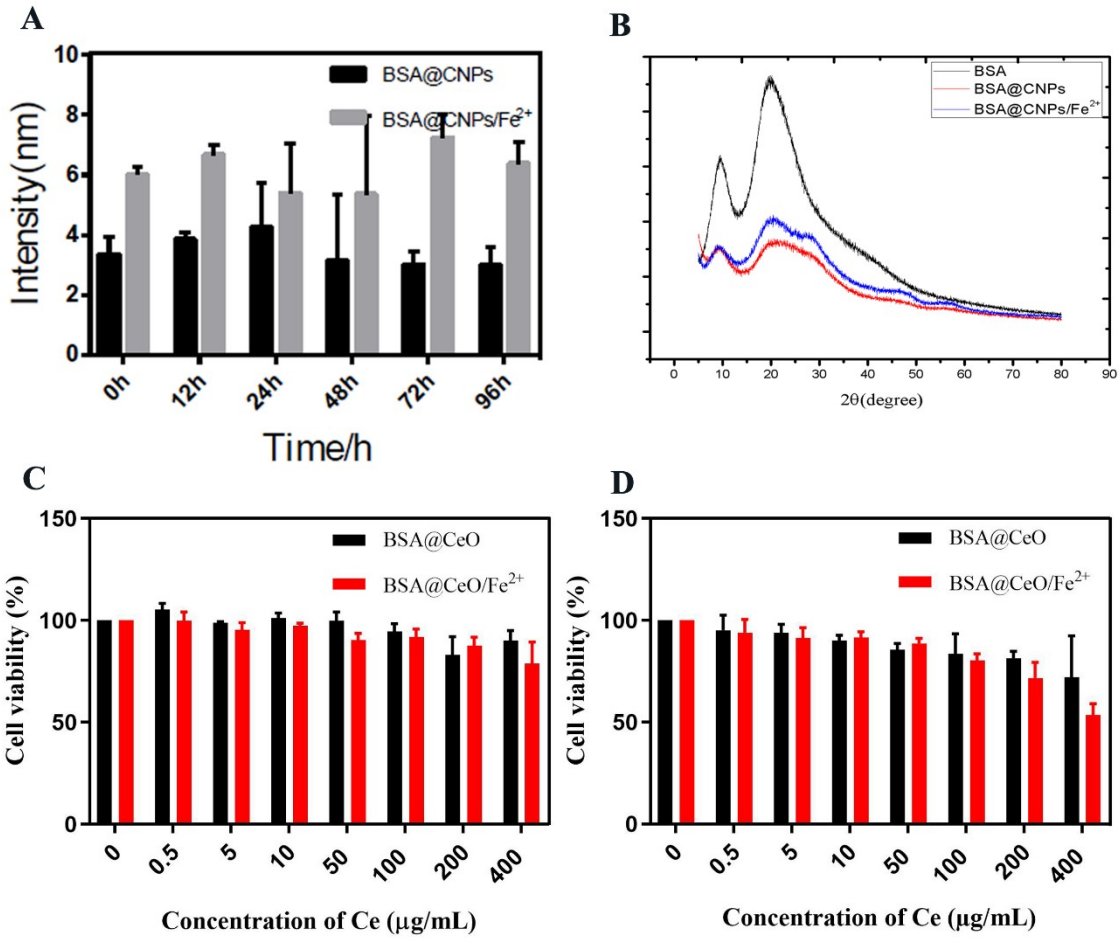

Fig. S1 (A) Nanozymes stored at 4 degrees Celsius with a change in particle size. (B) XRD analysis of BSA, BSA@CeO, and BSA@CeO/Fe^{2+}. (C) The relative viabilities of 4T1 cells incubated with different concentrations of BSA@CeO and BSA@CeO/Fe^{2+} in PH=7.4 condition. (D) The relative viabilities of 4T1 cells incubated with different concentrations of BSA@CeO and BSA@CeO/Fe^{2+} in pH=6.5 condition.

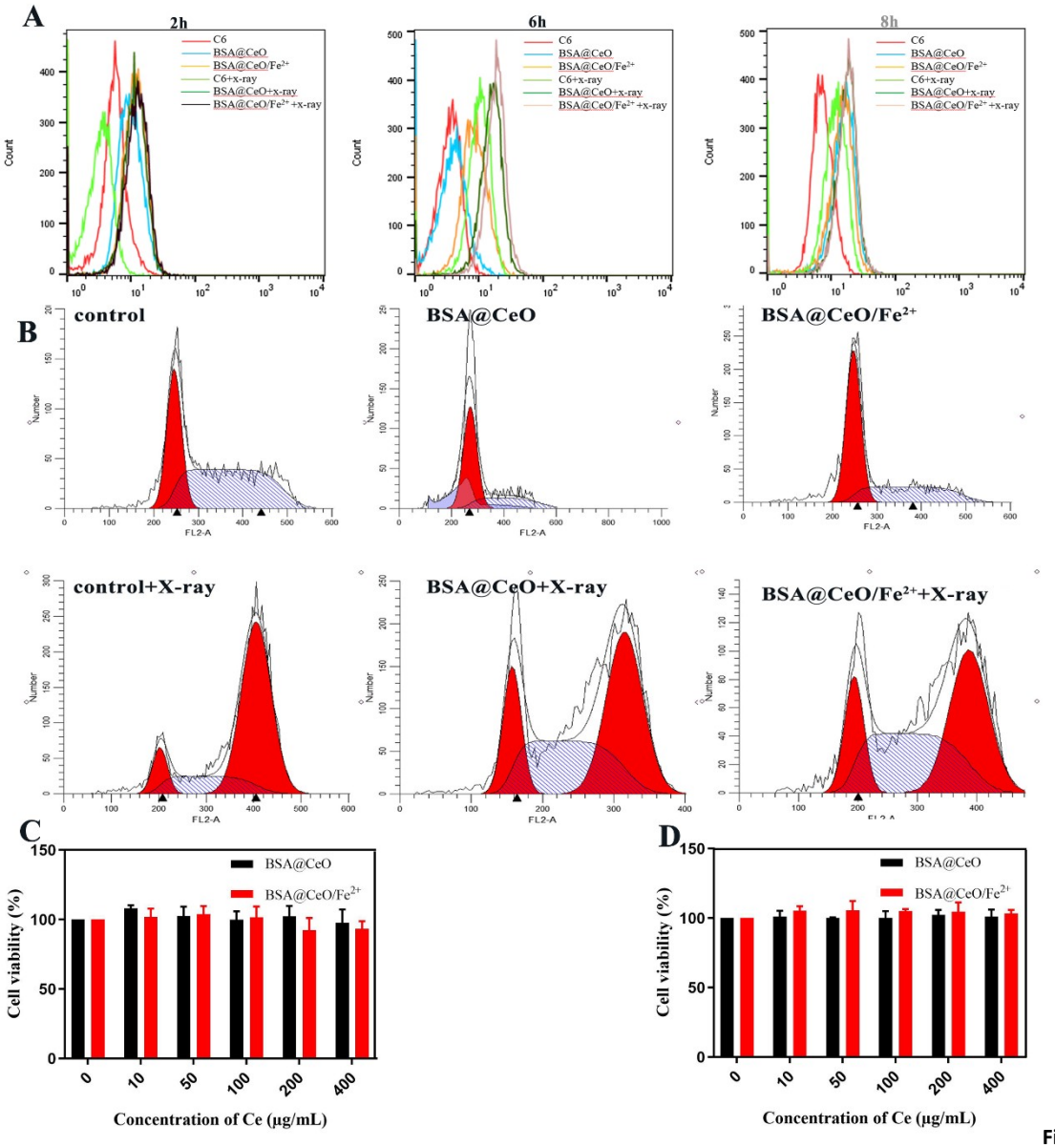

Fig. S2 (A) Flow cytometry measurement of FITC fluorescence intensities in 4T1 cells after 2, 6, and 8 h of incubation with BSA@CeO, and BSA@CeO/Fe^{2+}. (B) Cell cycle changes were determined by flow cytometry. (C) The relative viabilities of L-02 cells incubated with different concentrations of BSA@CeO and BSA@CeO/Fe^{2+}. (D) The relative viabilities of HUVECs cells incubated with different concentrations of BSA@CeO and BSA@CeO/Fe^{2+}.

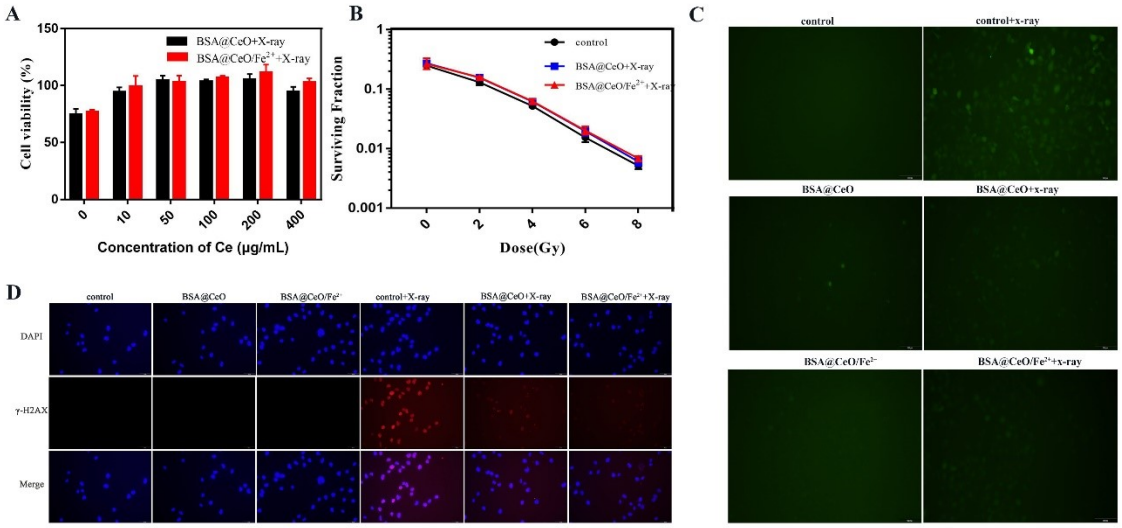

Fig. S3 (A) The relative viabilities of HUVEC cells incubated with different concentrations of BSA@CeO and BSA@CeO/Fe^{2+}. (B) Clonogenic survival assay of HUVEC cells treated with PBS or BSA@CeO and BSA@CeO/Fe^{2+}under a series of radiation doses at 0, 2, 4, 6, and 8 Gy. (C) Fluorescence images of the intracellular ROS in HUVECs after different treatments. (D) γ-H2AX immufluorescence images of DNA double-strand damage in L-02 after different treatments. (Each experiment was conducted at normal condition (pH=7.4))

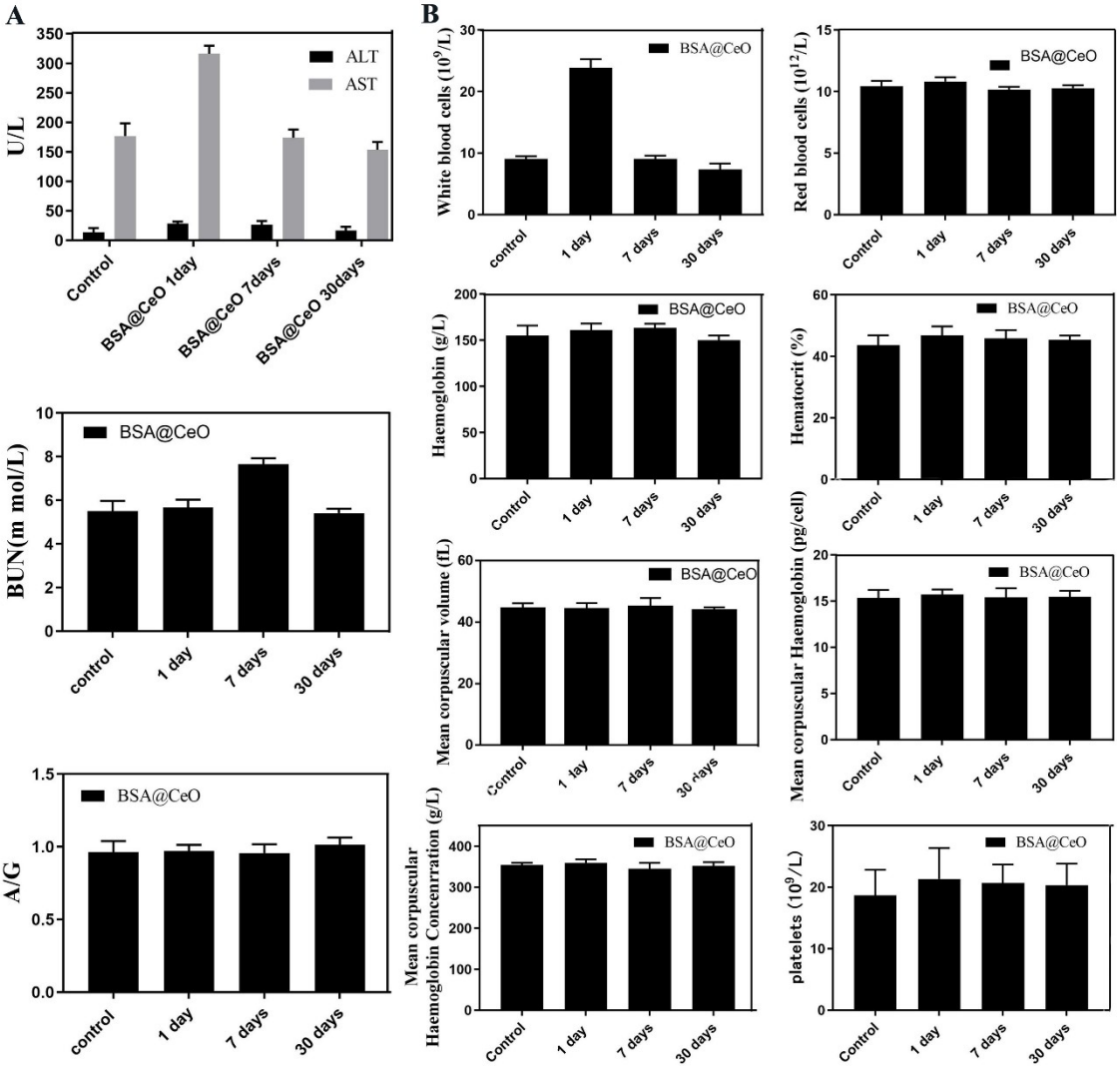

Fig. S4 The blood of mice treated with or without nanozymes were analyzed at different times. (A) ALT and AST in the blood, the albumin/globin ratios and the Blood urea nitrogen (BUN). (B) Blood routine analysis. White blood cells, red blood cells, hemoglobin, hematocrit, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, and platelets.

Table S1

Content of cerium and iron in nanomaterials by ICP-OES

Sample	Sampling quality /g	Constant volume/ml	Dilution coefficient	Measured element	Instrument reading	Company
BSA@CeO solution	0.9151	25	1	Ce	7.4743	mg/L
BSA@CeO powder	0.0219	50	50	Ce	0.3035	mg/L
BSA@CeO/Fe^{2+}solution	1.0021	25	1	Fe	0.2357	mg/L
BSA@CeO/Fe^{2+}powder	0.0132	25	1	Fe	0.3572	mg/L
BSA@CeO/Fe^{2+}solution	1.0021	25	1	Ce	8.4318	mg/L

Table S2

Cell cycle changes were determined by flow cytometry.

Sample	G1	G2/M	S
Control	38%	0%	62%
BSA@CeO	70.77%	0%	29.23%
BSA@CeO/Fe^{2+}	62.9%	0%	37.1%
Control+X-ray	9.65%	71.84%	18.51%
BSA@CeO+X-ray	18.07%	45.59%	36.34%
BSA@CeO/Fe^{2+}+X-ray	17.17%	41.90%	40.95%

Table S3

Measurement heart, liver, spleen, and lung kidneys of inoculated diplonemid mice with or without X-ray by ICP-MS.

Tissues	BSA@CeO (Ce: mg/kg)	BSA@CeO/Fe^{2+} (Ce: mg/kg)	BSA@CeO/Fe^{2+} (Fe: mg/kg)
heart	126.86	1.68	185.66
liver	1.37	15.68	38.93
spleen	774.37	115.48	647.55
lung	96.11	3.06	102.81
kidney	99.46	3.33	118.99