

Supporting Information

A comprehensive evaluation of ZrC nanoparticle in combined photothermal and radiation therapy for treatment of triple-negative breast cancer

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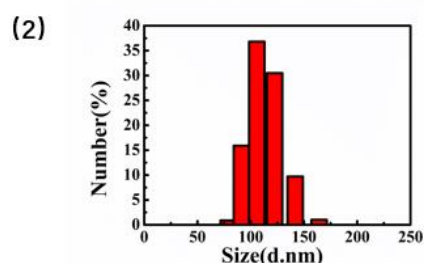
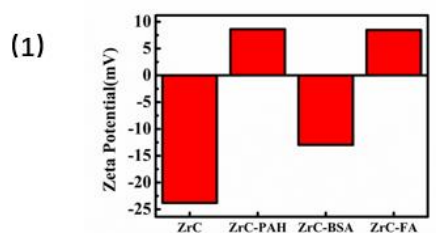
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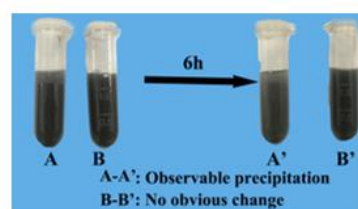
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Jiang shan and Liu zhao contributed equally to this study.



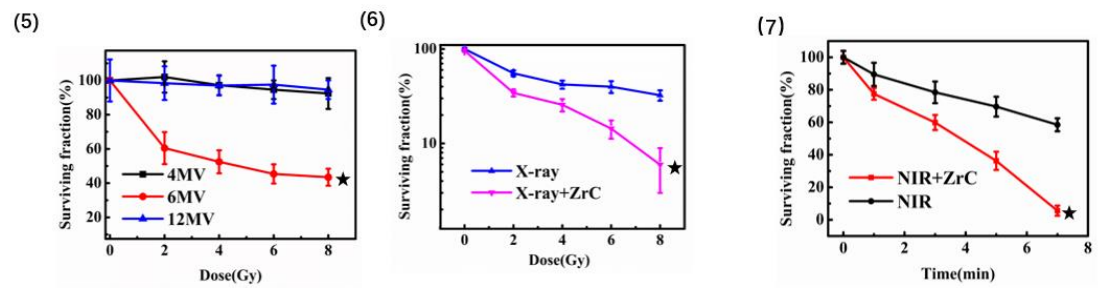
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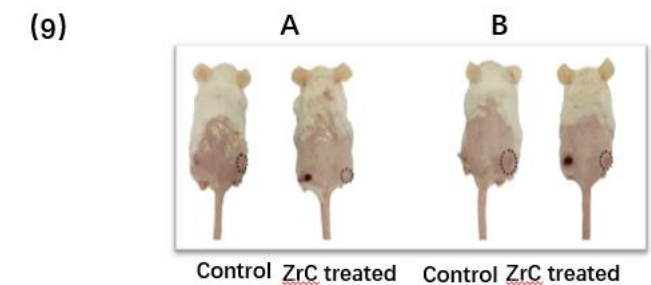
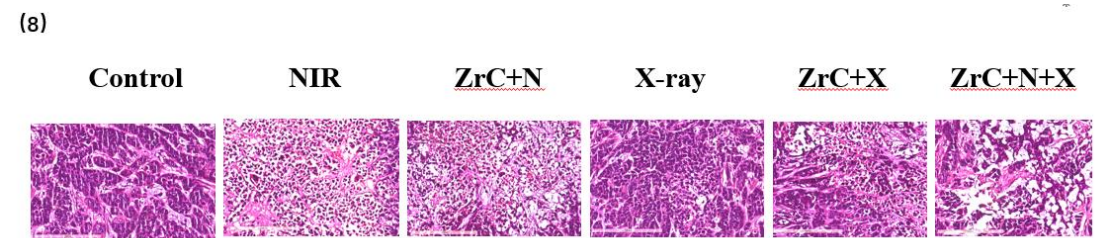
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Z	Element	Family	Atomic Fraction (%)	Atomic Error (%)	Mass Fraction (%)	Mass Error (%)	Fit error (%)
6	C	K	46.55	8.18	10.29	1.18	0.53
40	Zr	K	53.45	11.6	89.71	15.37	0.07

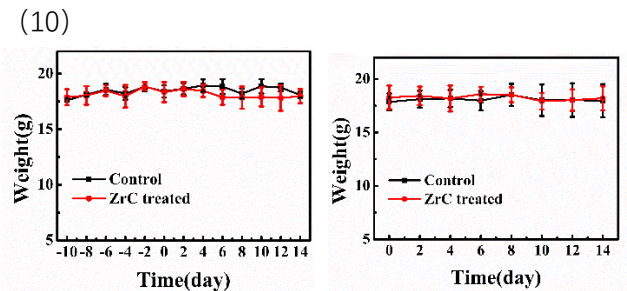
S1: Zeta potentials of as-prepared ZrC NPs,
 S2: Dynamic Light Scattering (DLS) data about the size distribution of ZrC NPs
 S3: Stability in physiological solutions of ZrC NPs. A is the ZrC powder dissolved in PBS and B is the solution of ZrC NPs.
 S4: Analysis of TEM



S5, Detection of the appropriate time of NIR irradiation for combine therapy
 S6-7, Exploration of effective energy level of X-ray radiation and dose(b-c), Error bars represent mean \pm SD. P values based on Student's t-test: *p < 0.05.

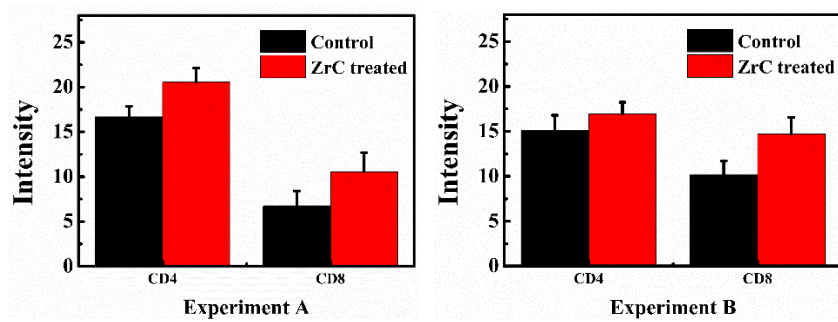


S8: Histology analysis of tumor tissues in (H&E) method.
 S9: Pictures of Balb/c mice with bilateral tumors



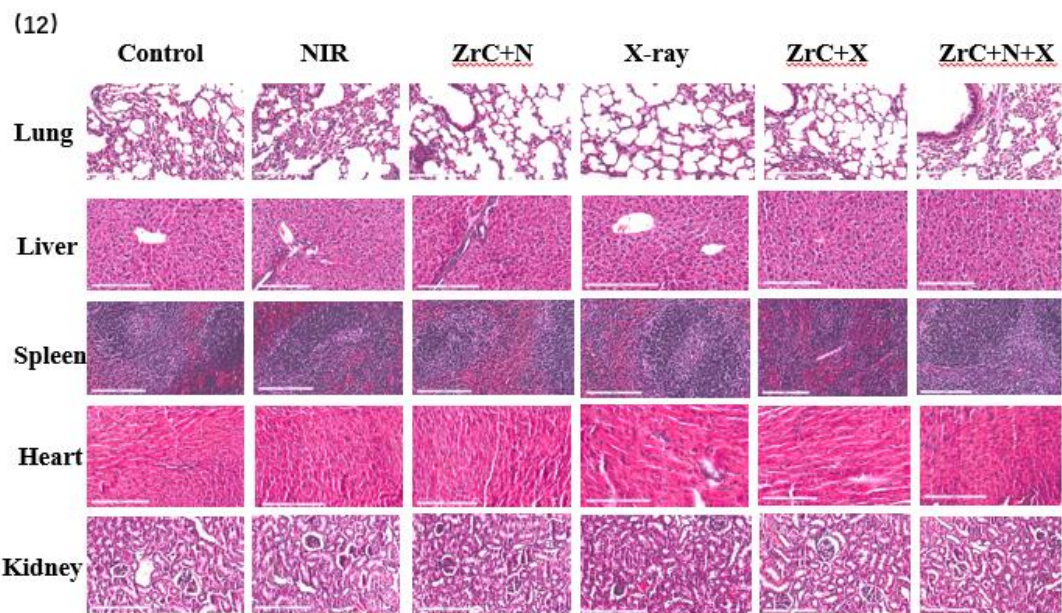
S10: The variations in weight of mice in two groups.

(11)



S11, Detect of T lymphocytes in distant tumors in flow cytometry.

(a/b) Error bars represent mean \pm SD. P values based on Student's t-test: *P < 0.05

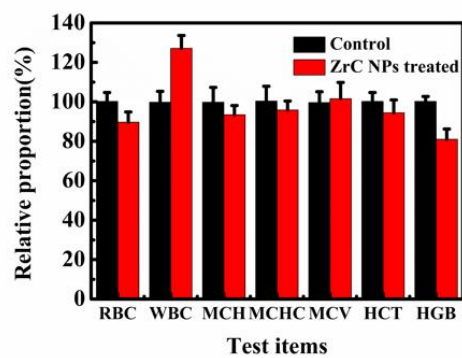


S12

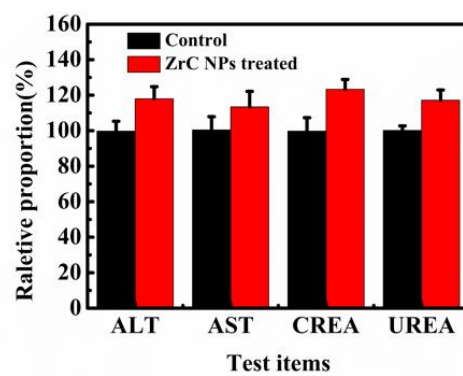
H & E staining image of main organs in healthy female Balb/c mice after treatment.

ZrC+N, ZrC+X and ZrC+N+X groups were treated with intratumoral injection of ZrC NPs (200 μ g/mice).

(13)



(14)



S13: Blood routine analysis of the mice.

S14: Serum biochemical analysis of the mice. Error bars represent mean \pm SD.