Fe-Doped Carbon Dots Liposomes Enhanced Radiosensitivity of Tumor Cells via Inducing Ferroptosis

Guili Ge [a, b, 1], *Hanyu Tu* [c, 1], *Dan Wang* [b], *Mingjian Chen* [b], *Zhaoyang Zeng* [a, b], *Can Guo* [b, *], *Xu Wu* [d, *], *Wei Xiong* [a, b, *]

[a] NHC Key Laboratory of Carcinogenesis and Hunan Key Laboratory of Cancer Metabolism, Hunan Cancer Hospital and the Affiliated Cancer Hospital of Xiangya School of Medicine, Central South University, Changsha, 410013, China

[b] Key Laboratory of Carcinogenesis and Cancer Invasion of the Chinese Ministry of Education, Cancer Research Institute and School of Basic Medical Science, Central South University, Changsha 410008, China

[c] College of Chemistry and Chemical Engineering, Central South University, Changsha 410083, China

[d] Department of Chemistry and Center for Fluorinated Functional Materials, University of South Dakota, Vermillion, South Dakota 57069, United States

* Correspondence author. Tel: 86-13574820909. E-mail: xiongwei@csu.edu.cn (Wei Xiong); Tel:1-605-658-6744. E-mail: steven.wu01@usd.edu (Xu Wu); Tel:86-13875846749. E-mail: guocde@csu.edu.cn (Can Guo).

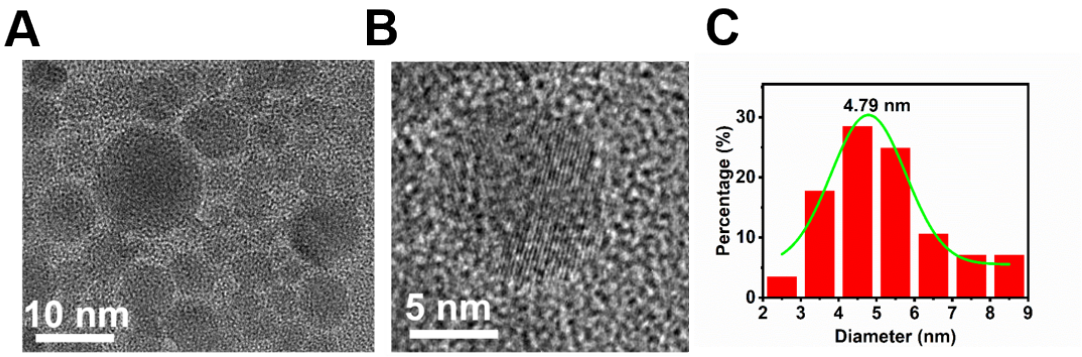

Figure. S1. Transmission electron microscopy (TEM) image of CDs: (A) low magnification (scale: 10 nm), (B) High magnification (scale: 5 nm). (C) particle size distribution histogram of CDs.

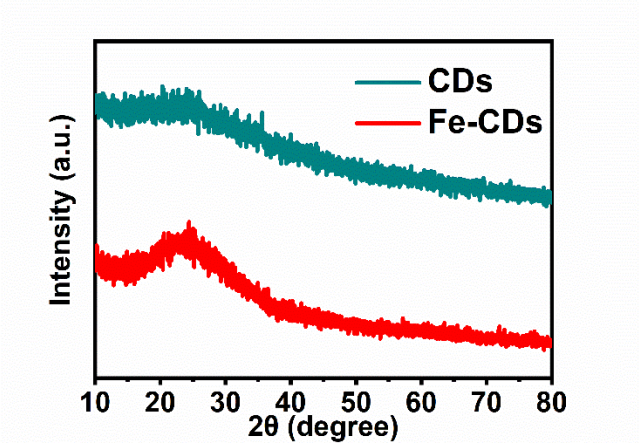

Figure. S2. X-ray diffraction (XRD) spectrum of the CDs and Fe-CDs.

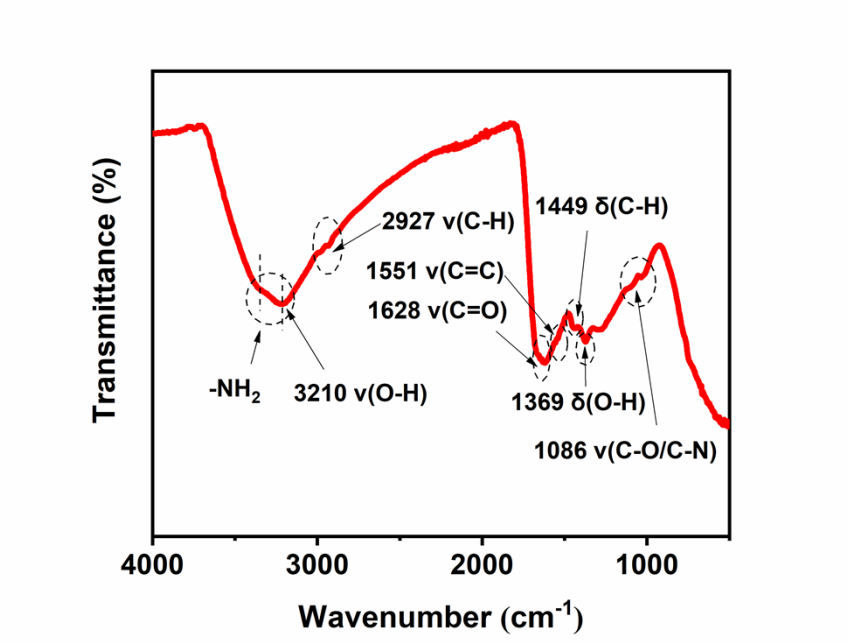

Figure. S3. Fourier transform infrared (FTIR) spectrum of CDs.

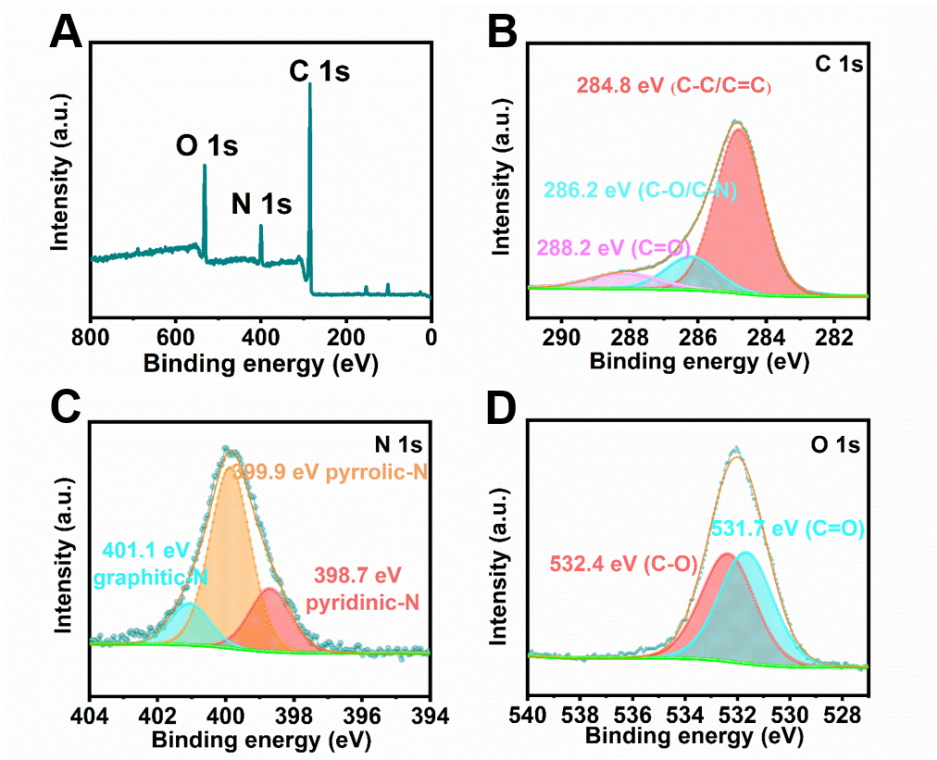

Figure. S4. X-ray photoelectron spectroscopy (XPS) spectra of CDs. (A) Full-survey of the CDs. High-resolution XPS of (B) C1s (C) N1 (D) O1s.

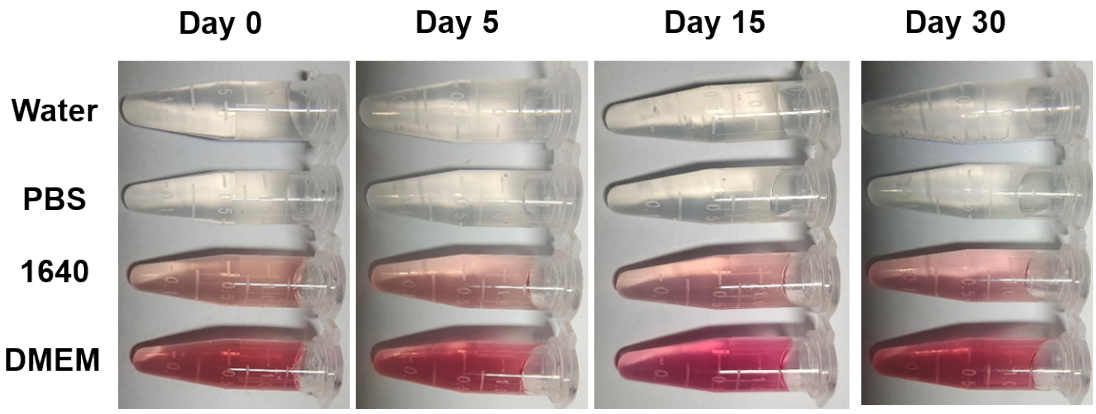

Figure. S5. Pictures of Fe-CDs-PEG dispersed in H_2O, PBS, RPMI-1640 and DMEM cell culture for 30 days.

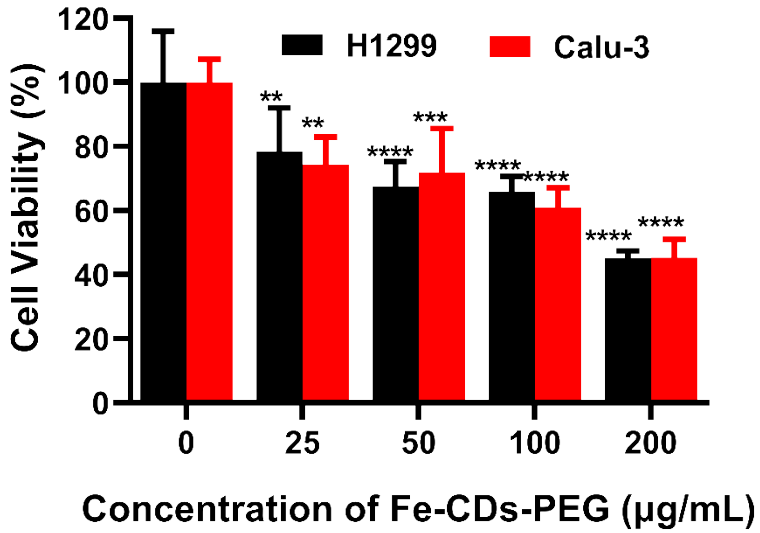

Figure. S6. Relative cell viability of H1299 and Calu-3 cells co-incubated with different concentrations of Fe-CDs-PEG.

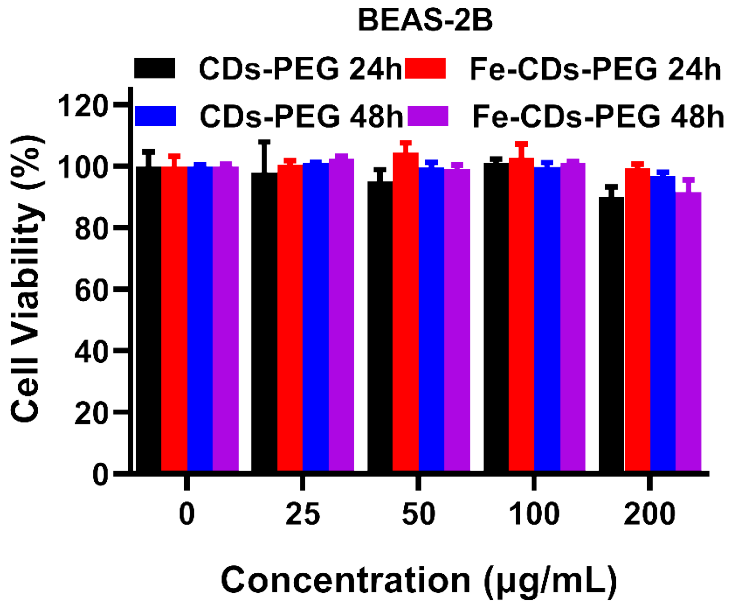

Figure. S7. Relative cell viability of BEAS-2B cells co-incubated with different concentrations of CDs-PEG and Fe-CDs-PEG.

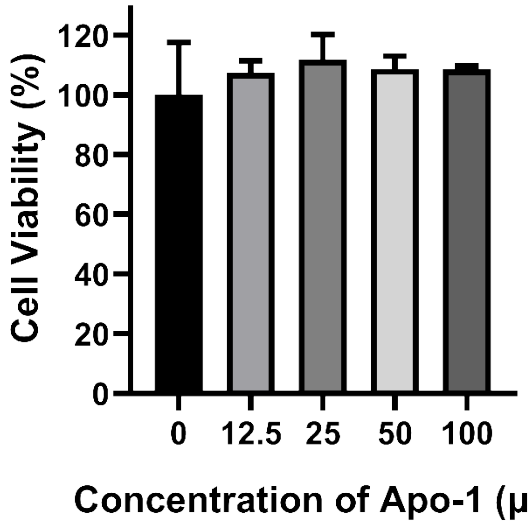

Figure. S8. Effects of different concentrations of apoptosis inhibitor Ac-DEVD-CHO (Apo-1) on A549 cell viability.

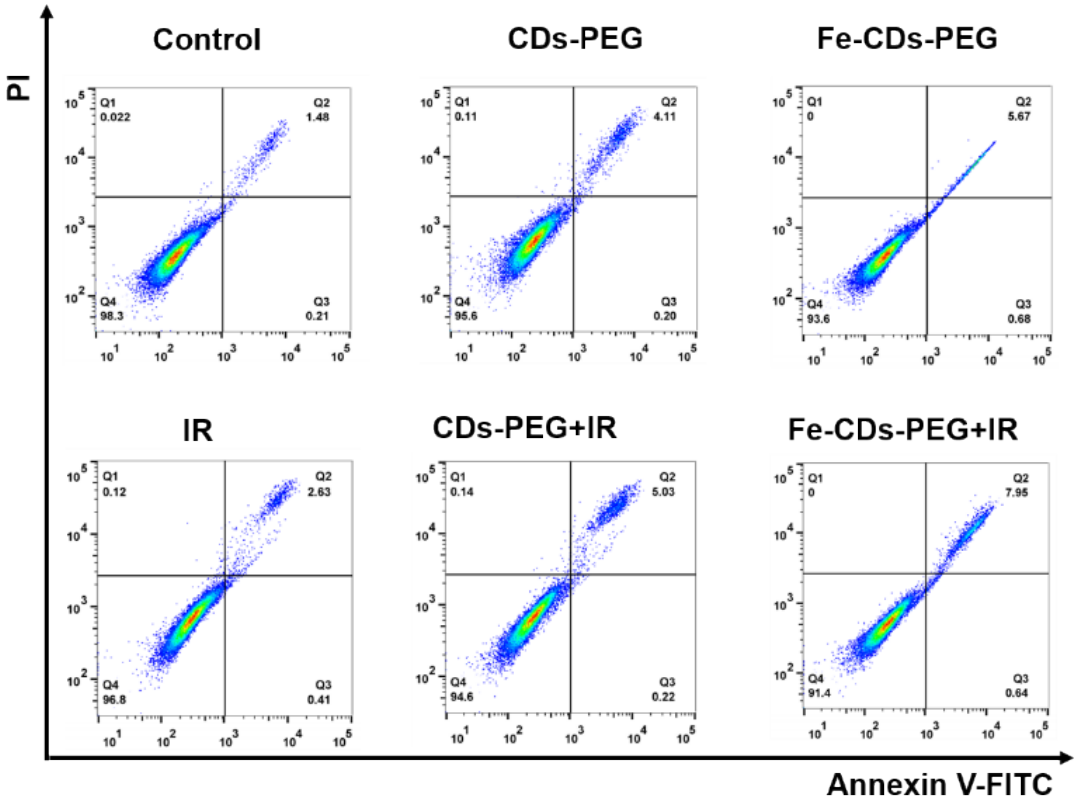

Figure. S9. Flow cytometry analysis of apoptosis in A549 cells after various treatments.

Table S1 Zeta potential values of CDs and Fe-CDs before and after modification

Sample	CDs	CDs-PEG	Fe-CDs	Fe-CDs-PEG
Zeta potential（mV）	-21.8	0.03	-28.3	-0.05