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Multifunctional Fe_3O_4-CdTe@SiO_2@carboxymethyl chitosan drug nanocarriers: synergistic effect towards magnetic targeted drug delivery and cell imaging

Guannan Wang [a, b], Li Jin [a], Lu Niu [b], Yaxue Liu [a], Fu Ren [a]*, Xingguang Su [b]*

[a] Department of Chemistry, College of Pharmacy & Anthropology institute, Liaoning Medical University, Jinzhou, 121001, China

[b] Department of Analytical Chemistry, College of Chemistry, Jilin University, Changchun，130012, China

The encapsulation efficiency (EE) and the drug loaded content (LC)

The DOX used as chemotherapeutic drug was loaded into the drug nanocarriers in this work. After preparation of drug nanocarriers, the suspension was then centrifuged at 5000rpm for 15min at room temperature, the precipitate was re-dispersed in 5mL solution of PBS. Further purification by repeated centrifugation and washing was done for at least three times. All the upper solutions were collected, and the concentration of free DOX in the suspension after loaded was determined by the high performance liquid chromatography (HPLC), the detection wavelength was at 254 nm and the column operated at 25℃. Figure S1 shows the calibration curve relation between the concentration of standard DOX samples and peak area in the HPLC spectrum. The inset of Figure 1S shows the HPLC spectrum of DOX standard sample, and the retention time was around 9 min. The linear regression equation is as follows: Y =-738.00+45.47 C_{DOXO} (μg/mL), and the coefficient of correlation is 0.999. The amount of free DOX after encapsulation can be calculated via the linear regression equation. The DOX encapsulation efficiency (EE) and the DOX loaded content (LC) of polymeric drug nanocarriers were calculated according to the equation reported in previous work [1].

$$Drug\ loaded\ content\ (\%) = \frac{weight\ of\ drug\ in\ drug\ \text{nanocarriers}}{weight\ of\ drug\ \text{nanocarriers}} \times 100\% \qquad (1)$$

$$Drug\ encapsulation\ efficiency\ (\%) = \frac{weight\ of\ drug\ in\ drug\ \text{nanocarriers}}{weight\ of\ feed\ weight} \times 100\% \qquad (2)$$

The weight of drug in nanoparticles can be obtained by subtracting the amount of free DOX in the suspension after encapsulation from weight of feed drug, and the weight of dried DOX-loaded drug nanocarriers was accurately measured by analytical balance (sensitivity in the 0. 01 mg).

In this work, the DOX loaded content was approximatedly 7.06% and encapsulation efficiency was up to 76.8%.

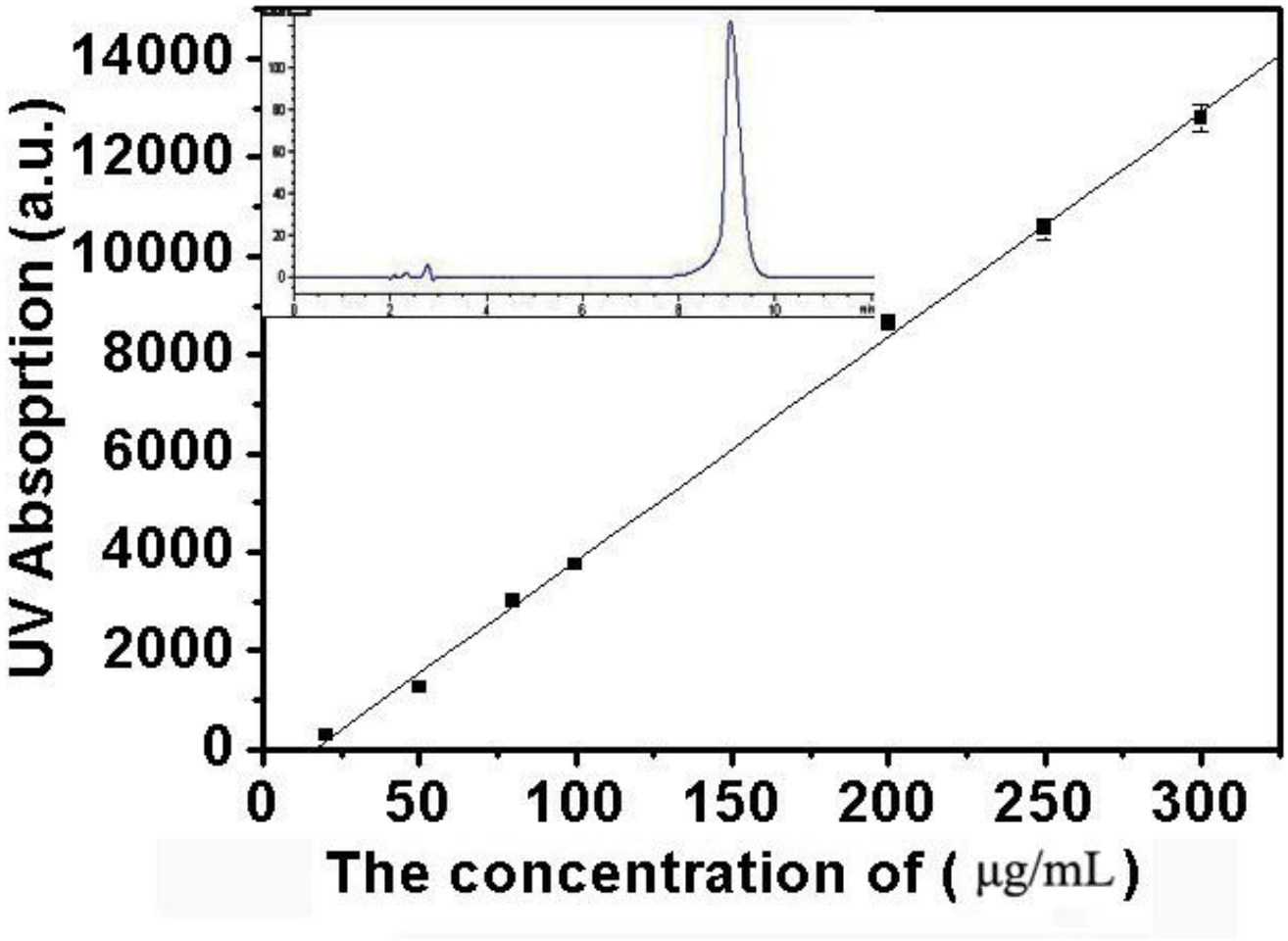

Figure 1S The curve relation between the UV absorption with the concentration of DOX measured by the HPLC. The inset shows the HPLC spectrum of DOX standard sample.

References

1 J. Gao, W. Zhang, P. Huang, B. Zhang, X. Zhang, B. Xu, *J. Am. Chem. Soc.*, 2008, **130**, 3710.