

## Supporting Information

### Charge-Convertible Carbon Dots for Imaging-Guided Drug Delivery with Enhanced *in Vivo* Cancer Therapeutic Efficiency

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Table of Contents:

1. DLS of CDs.....	S4
2. Powder XRD pattern of CDs.....	S4
3. FTIR spectrum of CDs.....	S5
4. Linear curve for amino group quantitative determination.....	S5
5. MTT assay for CDs against A2780 cells.....	S6
6. Fluorescence imaging of A2780 cells treated with CDs.....	S6
7. FTIR spectra of cisplatin(IV) prodrug.....	S7
8. UV-Vis absorption spectrum of CDs-Pt(IV).....	S7
9. Fluorescence spectra of CDs-Pt(IV).....	S8
10. Platinum release profile of CDs-Pt(IV) .....	S8
11. Synthetic route of PEG-(PAH/DMMA) and PEG-(PAH/SA).....	S9
12. $^1\text{H}$ -NMR spectrum of PEG-PAH.....	S9
13. $^1\text{H}$ -NMR spectrum of PEG-(PAH/DMMA).....	S10
14. FTIR spectra of polymers.....	S10
15. TEM and DLS results of CDs-Pt(IV)@PEG-(PAH/DMMA).....	S11
16. Stability of CDs-Pt(IV)@PEG-(PAH/DMMA).....	S11
17. Mechanism for hydrolysis of dimethylmaleic amide at pH 6.8.....	S12
18. $^1\text{H}$ -NMR spectrum of PEG-(PAH/SA).....	S12
19. TEM and DLS results of CDs-Pt(IV)@PEG-(PAH/SA).....	S13
20. Stability of CDs-Pt(IV)@PEG-(PAH/SA).....	S13
21. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)@PEG-(PAH/DMMA).....	S14

22. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)@PEG-(PAH/SA).....	S14
23. FTIR spectrum of CDs-Pt(IV)/PEG.....	S15
24. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)/PEG.....	S15
25. Mean fluorescence intensity of A2780 cells treated with CDs-Pt(IV)/PEG.....	S16
26. MTT assay for CDs-Pt(IV)/PEG against A2780 cells.....	S16
27. Platinum release profile of CDs-Pt(IV)@PEG-(PAH/DMMA).....	S17
28. MTT assay for cisplatin against A2780 cells.....	S17
29. MTT assay for CDs-Pt(IV)@PEG-(PAH/DMMA) against HeLa cells.....	S18
30. Reference.....	S18

## 1. DLS of CDs

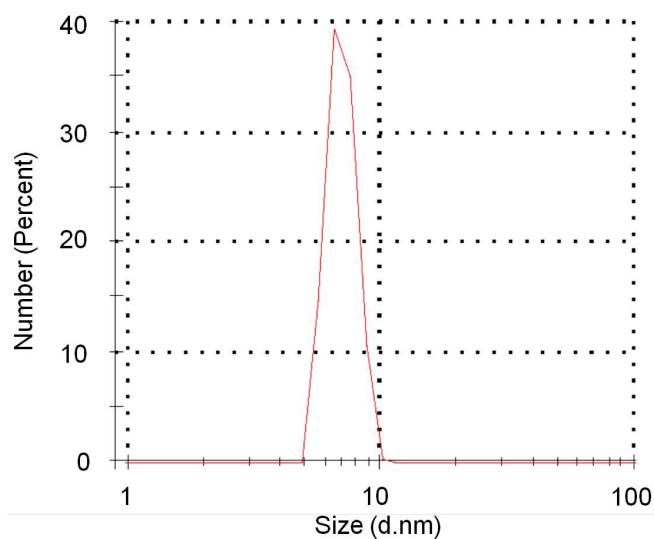


Figure S1. DLS of CDs ( $d = 7.0$  nm, PDI = 0.143).

## 2. Powder XRD pattern of CDs

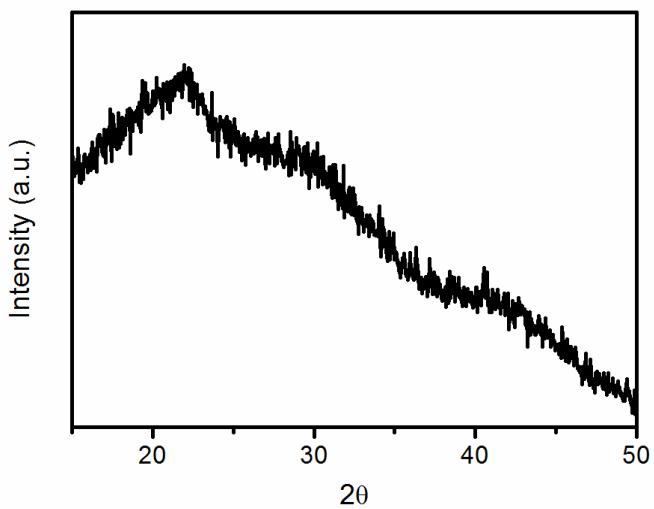


Figure S2. Powder XRD pattern of CDs.

### 3. FTIR spectrum of CDs

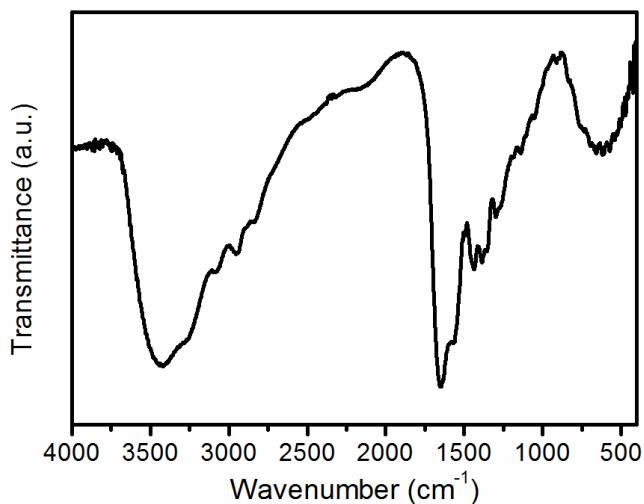


Figure S3. FTIR spectrum of CDs.

### 4. Linear curve for amino group quantitative determination

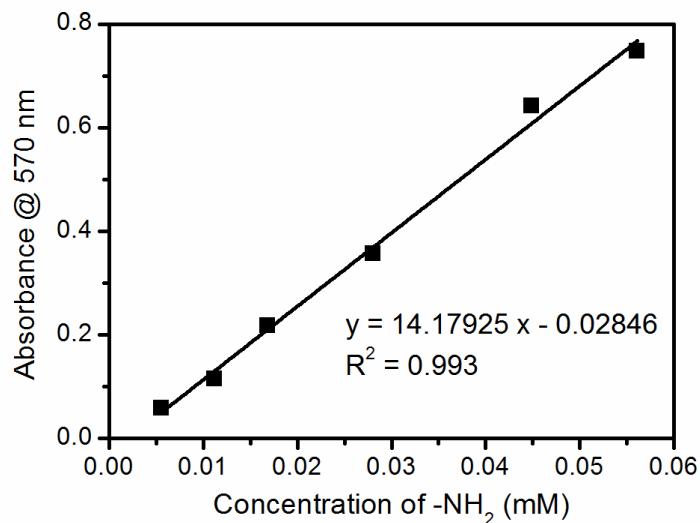


Figure S4. Linear relationship between absorbance of Ruhemann's purple at 570 nm and concentration of amino group using alanine as reference.

## 5. MTT assay for CDs against A2780 cells

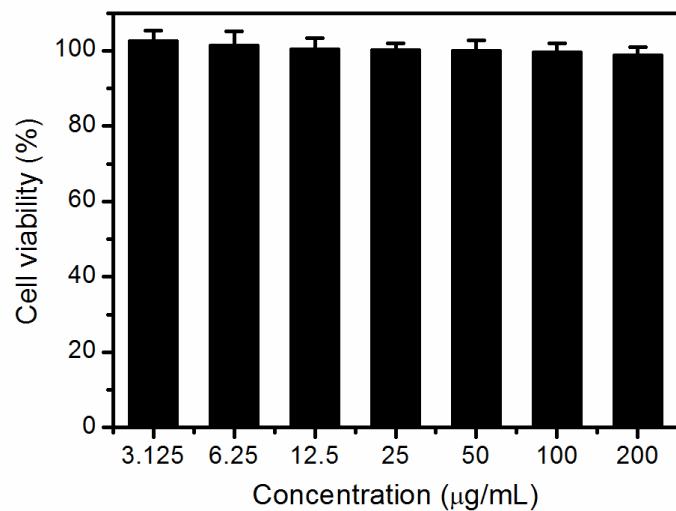


Figure S5. The cell viability of A2780 cells treated with CDs having concentrations from 3.125 to 200  $\mu\text{g/mL}$ .

## 6. Fluorescence imaging results of A2780 cells treated with CDs

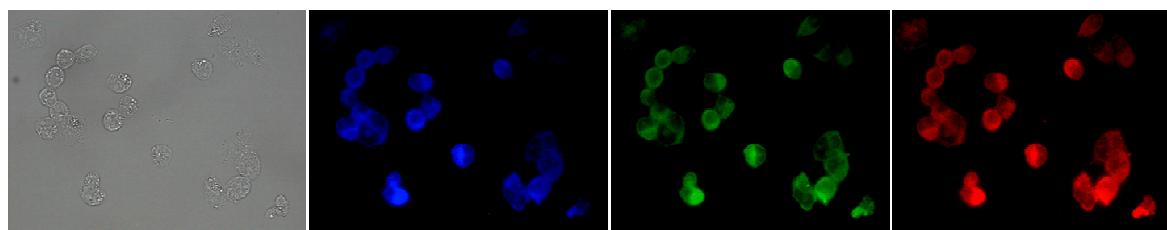


Figure S6. Multicolor fluorescence imaging of A2780 cells treated with CDs under excitation with 350 nm, 480 nm and 545 nm, respectively.

## 7. FTIR spectra of cisplatin(IV) prodrug

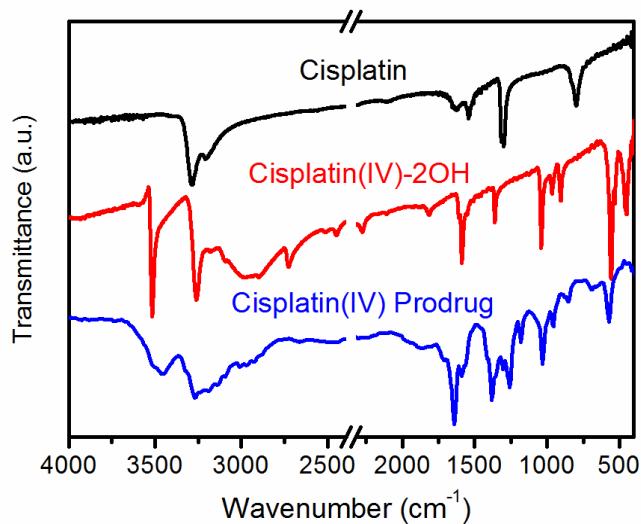


Figure S7. FTIR spectra of cisplatin, c,t,c-[ $\text{PtCl}_2(\text{OH})_2(\text{NH}_3)_2$ ] (cisplatin(IV)-2OH) and cisplatin(IV) prodrug.

## 8. UV-vis absorption spectrum of CDs-Pt(IV)

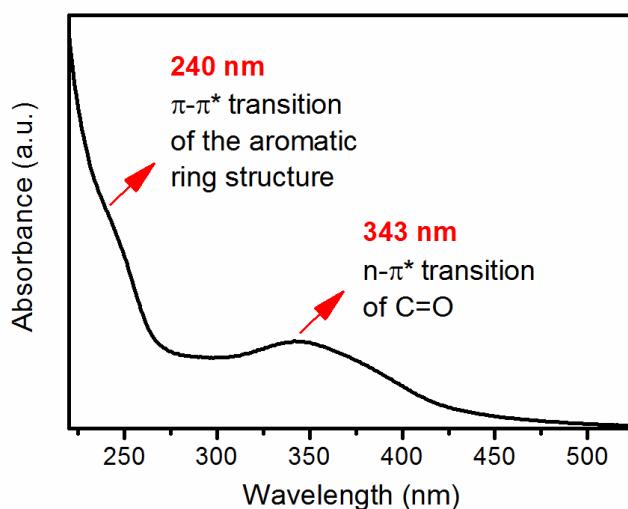


Figure S8. UV-vis absorption spectrum of CDs-Pt(IV).

## 9. Fluorescence spectra of CDs-Pt(IV)

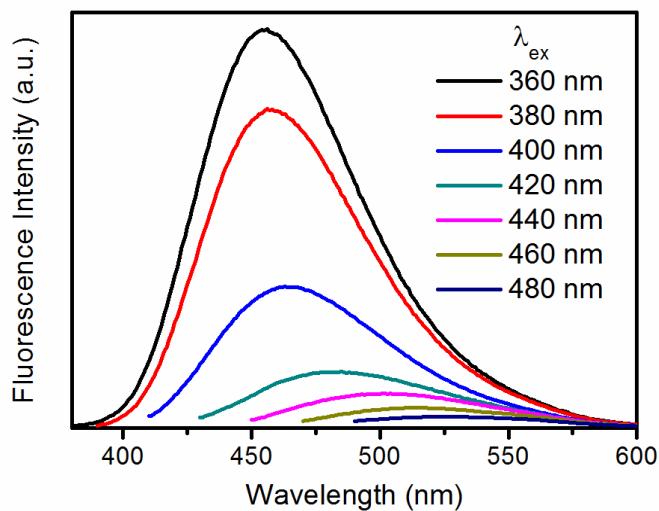


Figure S9. Fluorescence spectra of CDs-Pt(IV) with excitation wavelength from 360 to 480 nm.

## 10. Platinum release profile of CDs-Pt(IV)

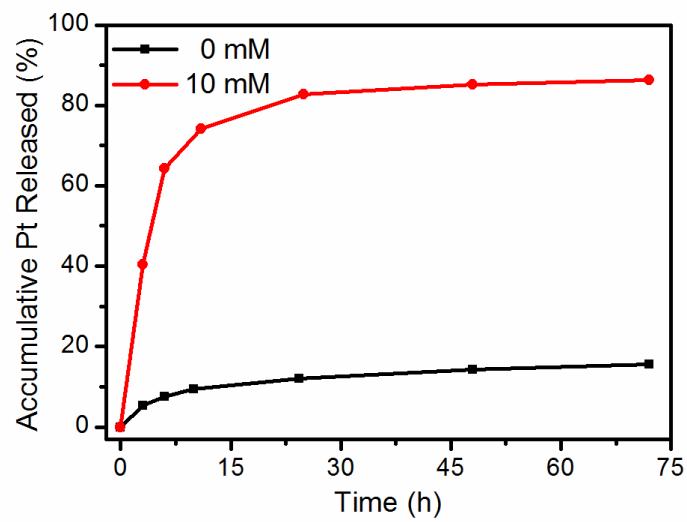


Figure S10. Platinum release profile of CDs-Pt(IV) in PBS buffer (10 mM, pH 7.4) with or without GSH (10 mM) at 37 °C for 72 h.

### 11. Synthetic route of PEG-(PAH/DMMA) and PEG-(PAH/SA)

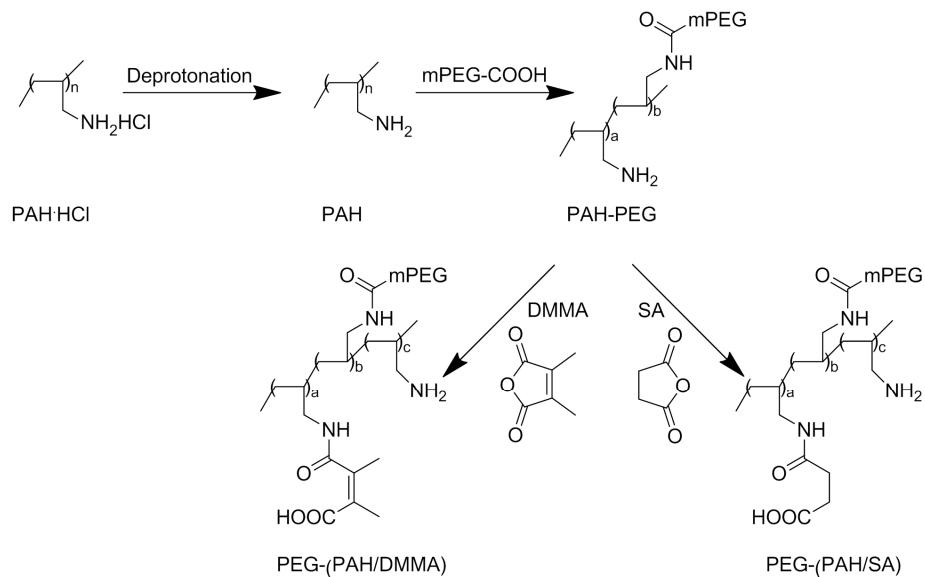


Figure S11. Synthetic route of PEG-(PAH/DMMA) and PEG-(PAH/SA).

### 12. $^1\text{H}$ NMR spectrum of PEG-PAH

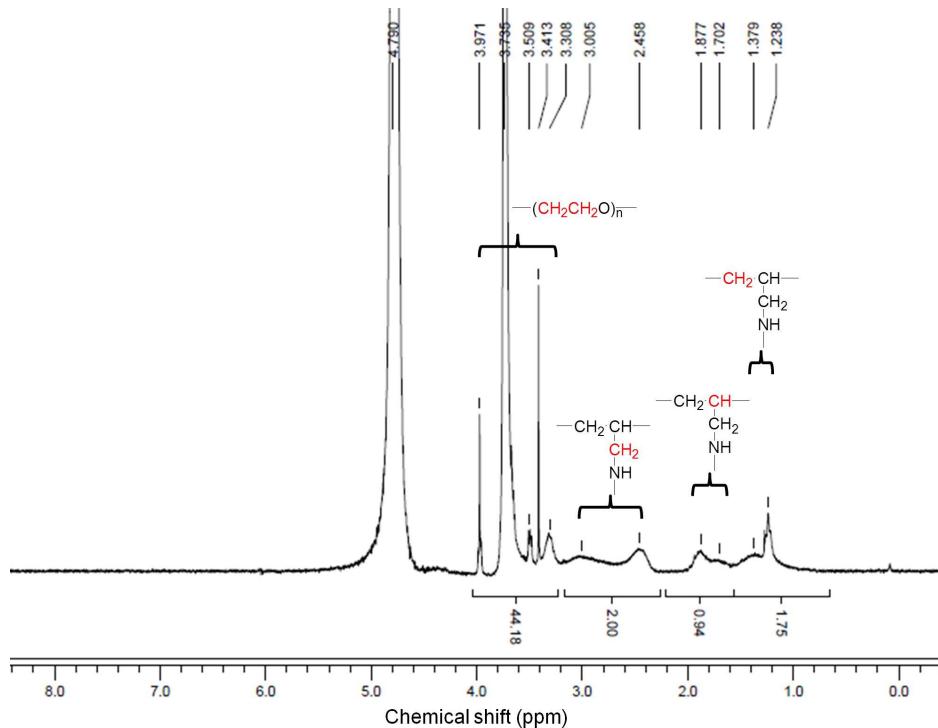


Figure S12.  $^1\text{H}$  NMR (300 MHz,  $\text{D}_2\text{O}$ ) spectrum of PEG-PAH.

### 13. $^1\text{H}$ NMR spectrum of PEG-(PAH/DMMA)

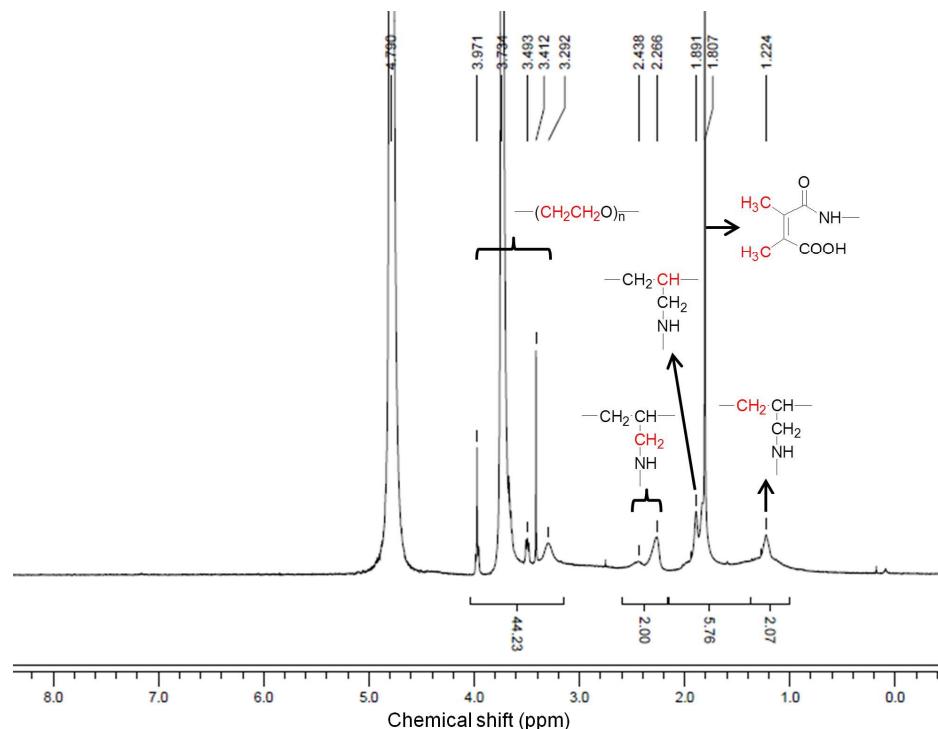


Figure S13.  $^1\text{H}$  NMR (300 MHz,  $\text{D}_2\text{O}$ ) spectrum of PEG-(PAH/DMMA).

### 14. FTIR spectra of polymers

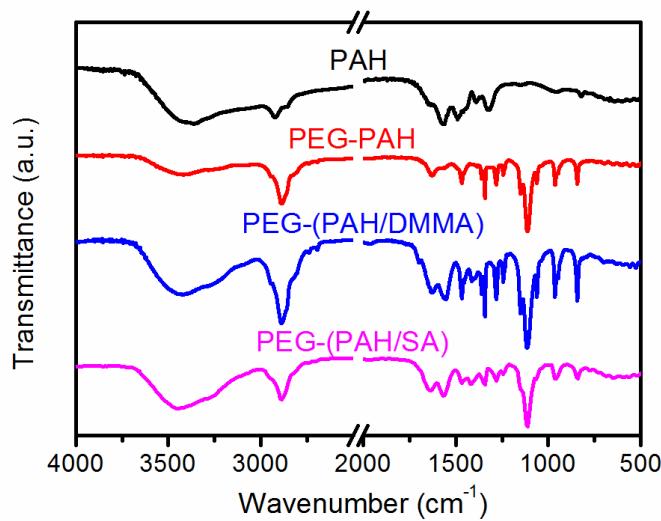


Figure S14. FTIR spectra of polymers PAH, PEG-PAH, PEG-(PAH/DMMA) and PEG-(PAH/SA).

### 15. TEM and DLS results of CDs-Pt(IV)@PEG-(PAH/DMMA)

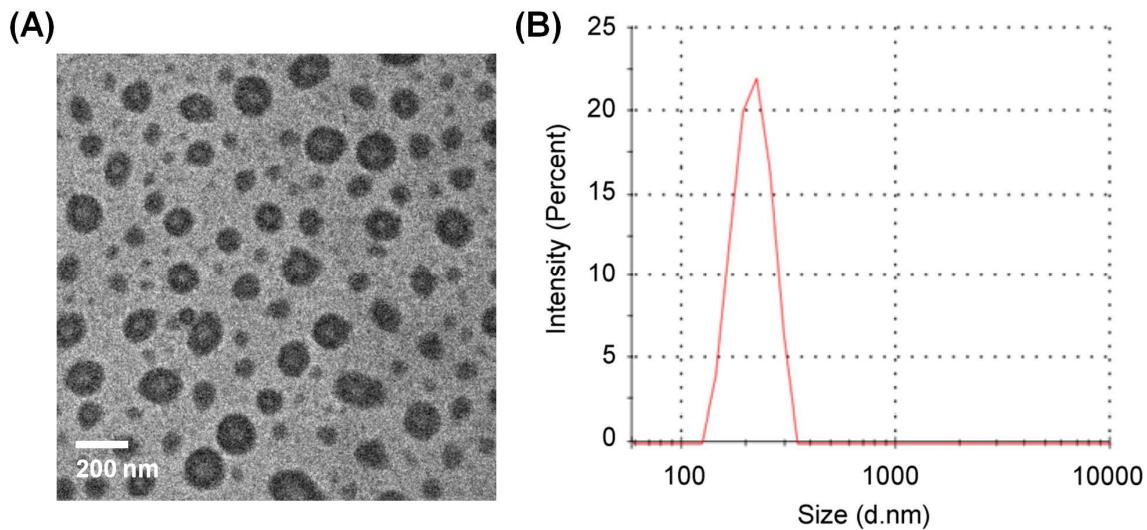


Figure S15. (A) TEM and (B) DLS results ( $d = 213.5$  nm, PDI = 0.135) of CDs-Pt(IV)@PEG-(PAH/DMMA).

### 16. Stability of CDs-Pt(IV)@PEG-(PAH/DMMA)

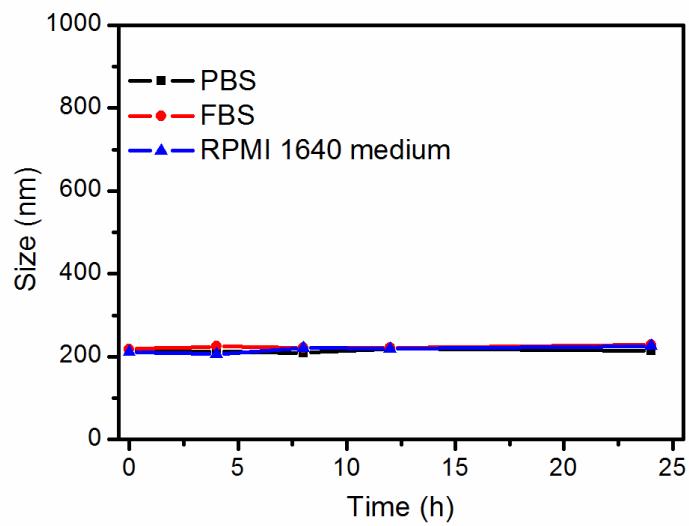


Figure S16. Changes in the particle size of CDs-Pt(IV)@PEG-(PAH/DMMA) upon the incubation with PBS (pH 7.4), FBS and RPMI 1640 medium for 24 h.

**17. Mechanism for hydrolysis of dimethylmaleic amide at pH 6.8**

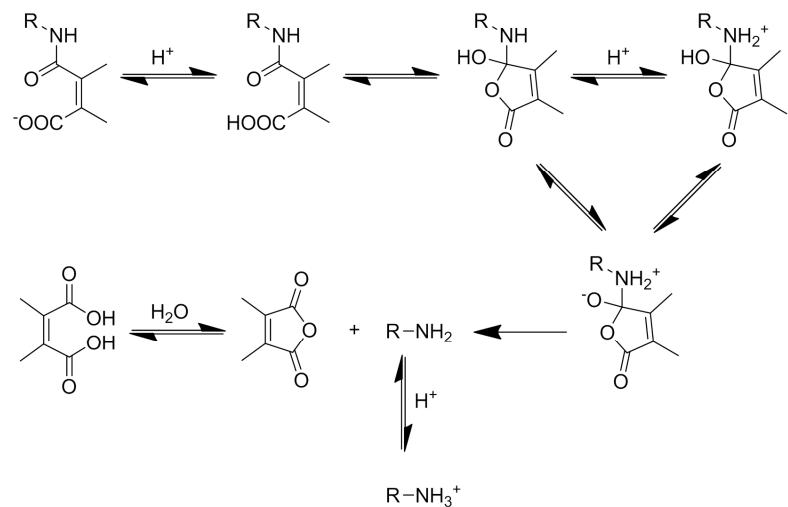


Figure S17. Mechanism for hydrolysis of dimethylmaleic amide at pH 6.8.<sup>S1</sup>

**18.  $^1\text{H}$  NMR spectrum of PEG-(PAH/SA)**

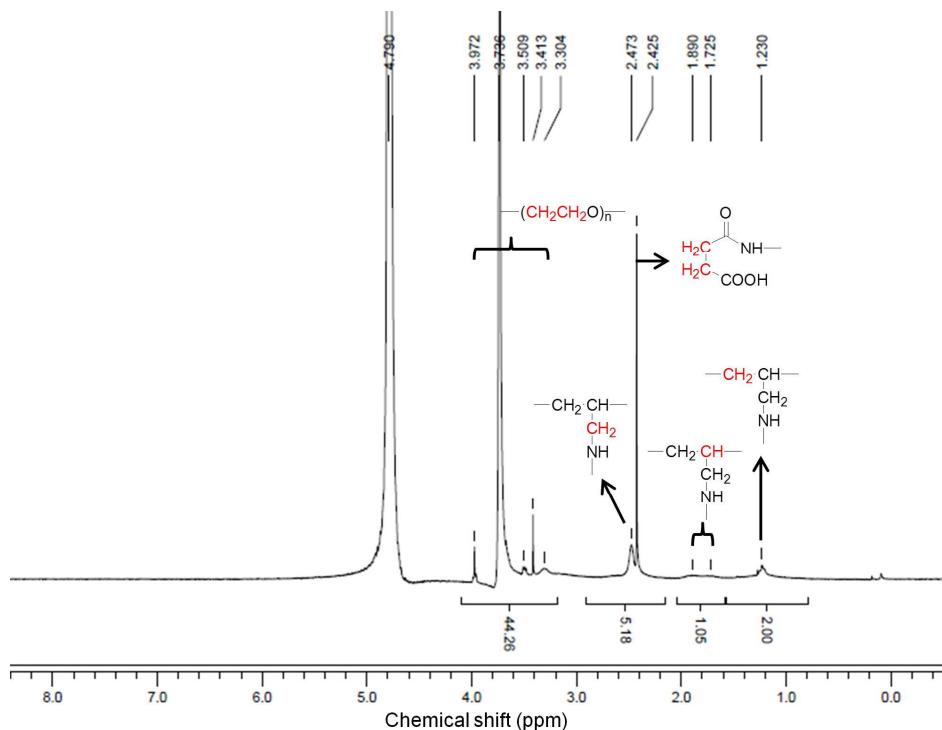


Figure S18.  $^1\text{H}$  NMR (300 MHz,  $\text{D}_2\text{O}$ ) spectrum of PEG-(PAH/SA).

### 19. TEM and DLS results of CDs-Pt(IV)@PEG-(PAH/SA)

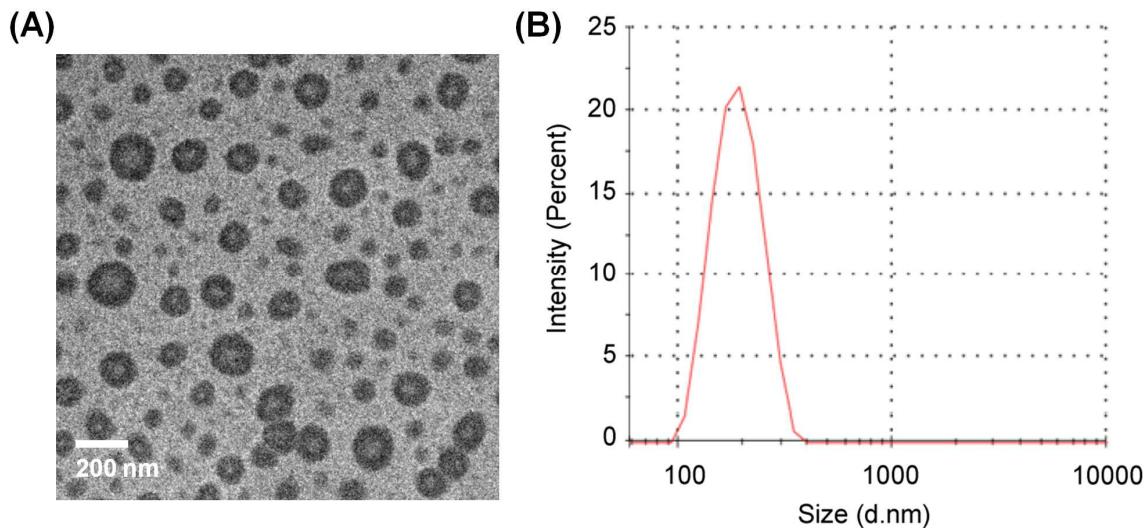


Figure S19. (A) TEM and (B) DLS results ( $d = 190.4$  nm, PDI = 0.053) of CDs-Pt(IV)@PEG-(PAH/SA).

### 20. Stability of CDs-Pt(IV)@PEG-(PAH/SA)

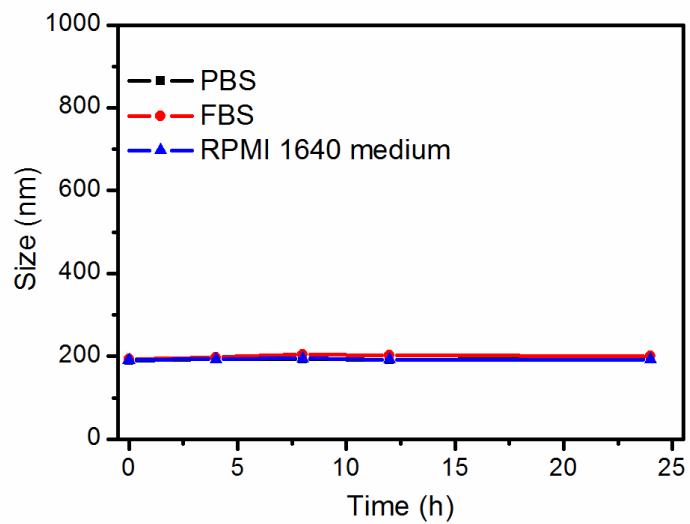


Figure S20. Changes in the particle size of CDs-Pt(IV)@PEG-(PAH/SA) upon the incubation with PBS (pH 7.4), FBS and RPMI 1640 medium for 24 h.

**21. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)@PEG-(PAH/DMMA)**

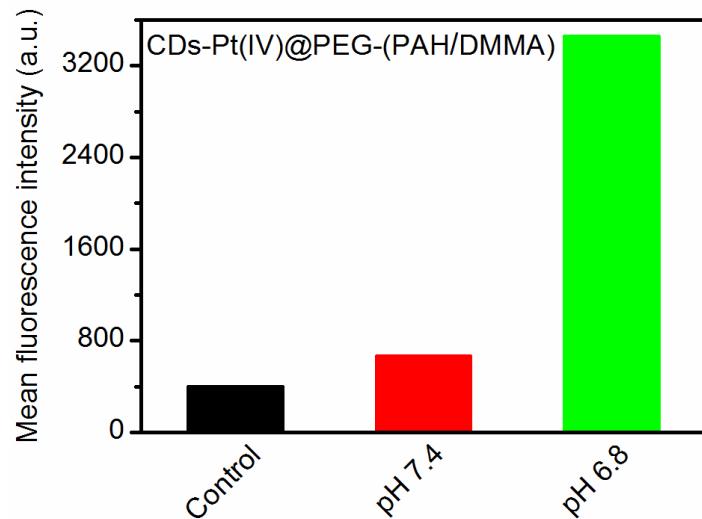


Figure S21. Mean fluorescence intensity of flow cytometry results for A2780 cells treated with CDs-Pt(IV)@PEG-(PAH/DMMA).

**22. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)@PEG-(PAH/SA)**

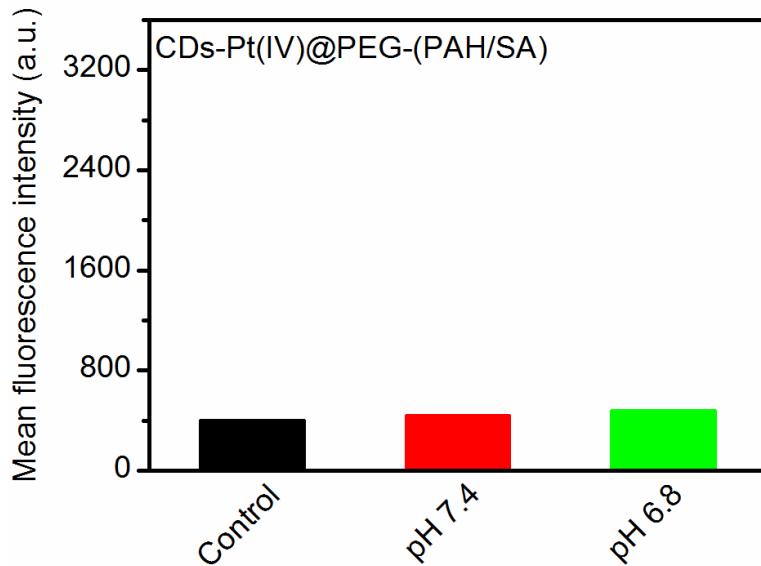


Figure S22. Mean fluorescence intensity of flow cytometry results for A2780 cells treated with CDs-Pt(IV)@PEG-(PAH/SA).

**23. FTIR spectrum of CDs-Pt(IV)/PEG**

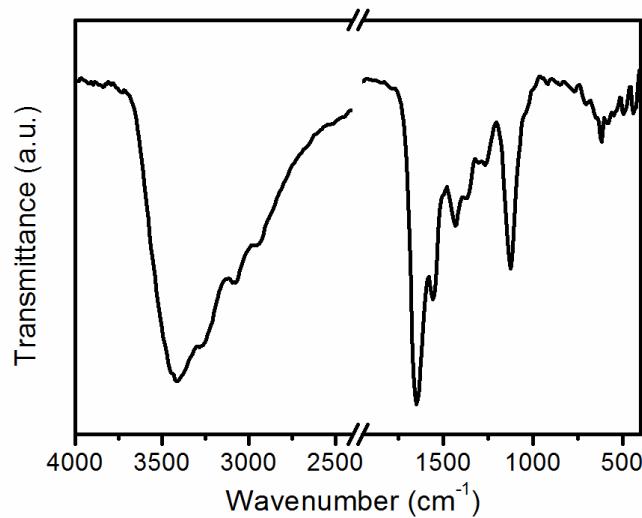


Figure S23. FTIR spectrum of CDs-Pt(IV)/PEG.

**24. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)/PEG**

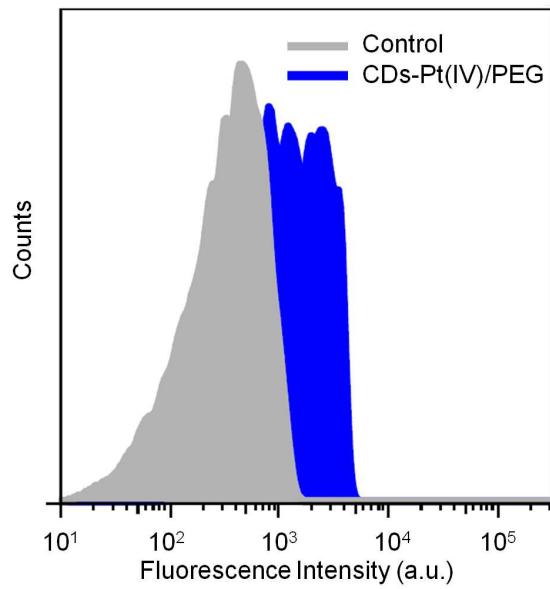


Figure S24. Flow cytometry results of A2780 cells treated with CDs-Pt(IV)/PEG.

**25. Mean fluorescence intensity of A2780 cells treated with CDs-Pt(IV)/PEG**

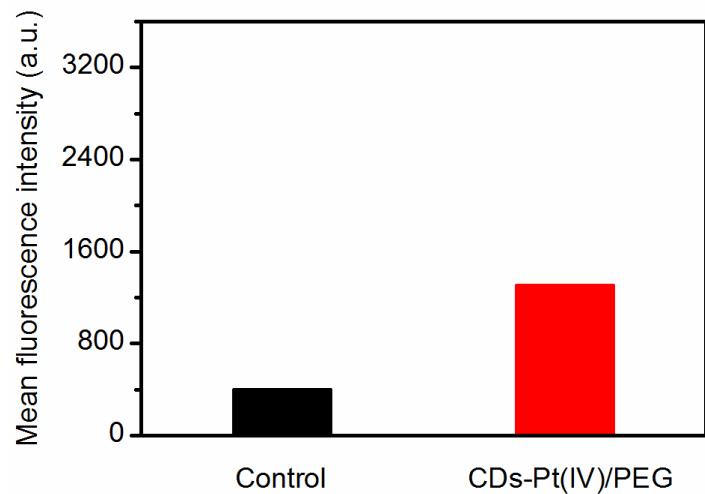


Figure S25. Mean fluorescence intensity of flow cytometry results for A2780 cells treated with CDs-Pt(IV)/PEG.

**26. MTT assay for CDs-Pt(IV)/PEG against A2780 cells**

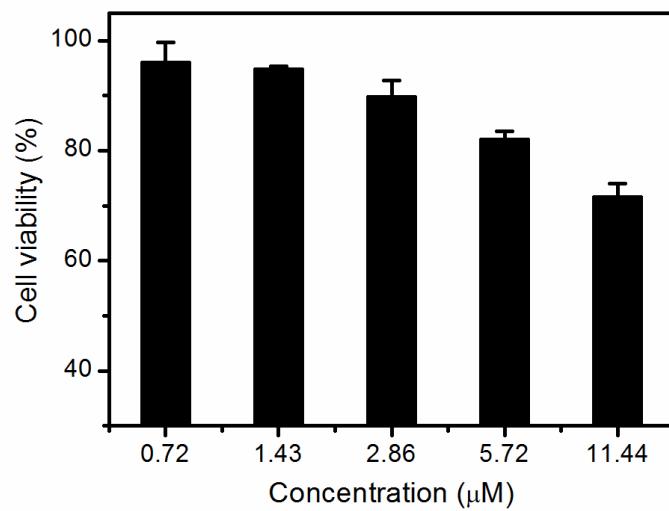


Figure S26. Cell viability of A2780 cells treated with CDs-Pt(IV)/PEG having concentrations from 0.72 to 11.44  $\mu\text{M}$ .

## 27. Platinum release profile of CDs-Pt(IV)@PEG-(PAH/DMMA)

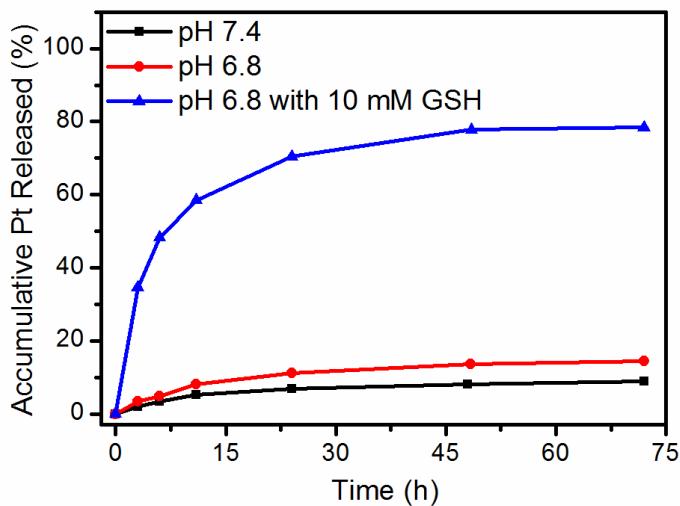


Figure S27. Platinum release profile of CDs-Pt(IV)@PEG-(PAH/DMMA) in PBS buffer (10 mM) under (A) pH 7.4, (B) pH 6.8, and (C) pH 6.8, GSH 10 mM at 37 °C for 72 h.

## 28. MTT assay for cisplatin against A2780 cells

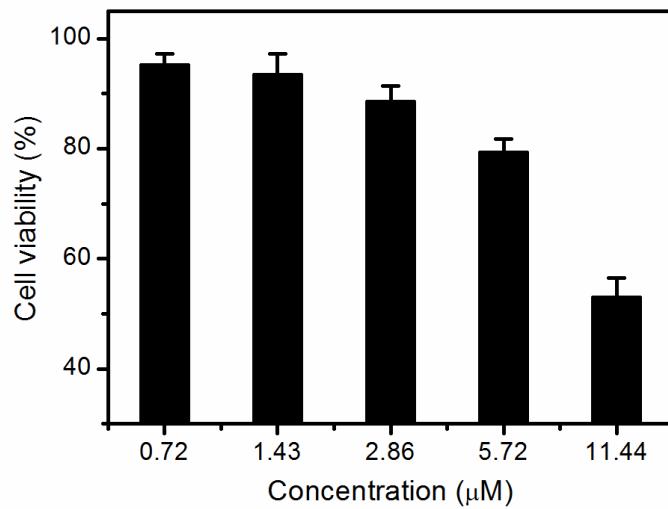


Figure S28. Cell viability of A2780 cells treated with cisplatin having concentrations from 0.72 to 11.44  $\mu$ M.

## 29. MTT assay for CDs-Pt(IV)@PEG-(PAH/DMMA) against HeLa cells

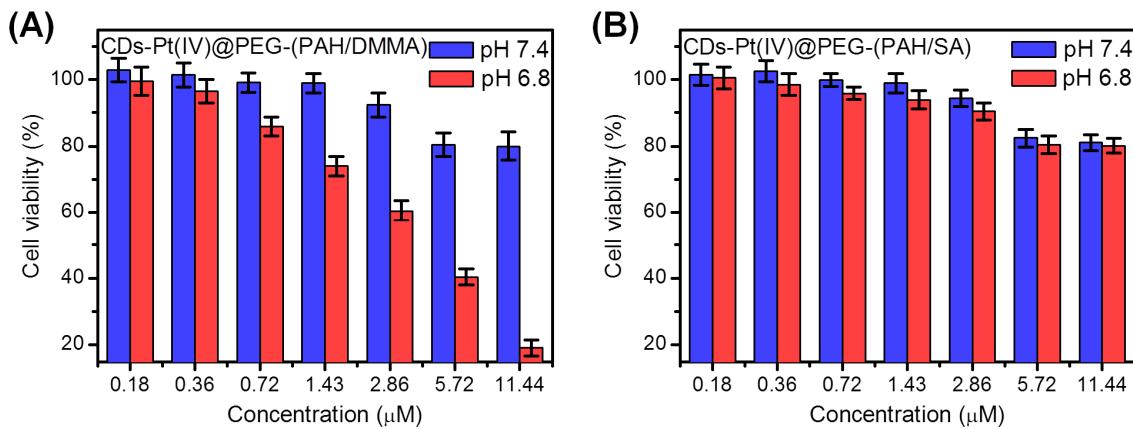


Figure S29. Cell viability of HeLa cells after prolonged incubation (24 h) with (A) CDs-Pt(IV)@PEG-(PAH/DMMA) and (B) CDs-Pt(IV)@PEG-(PAH/SA) at pH 7.4 and 6.8 at 37 °C.

## 30. Reference

- S1. Kluger, R.; Chin, J.; Choy, W.-W. Carboxylic Acid Participation in Amide Hydrolysis. Reactivity of Intermediates in the Internally Catalyzed Hydrolysis of *N*-Substituted 2,3-Dimethylmaleamic Acids. *J. Am. Chem. Soc.* **1979**, *101*, 6976-6980.