

# Nitrogen-Doped Carbon Dot Fluorescent Probe for Sensitive Detection of Metronidazole in Pharmaceutical Samples and Evaluation of Their Cytotoxicity and Cell Imaging Performance

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## Experimental section

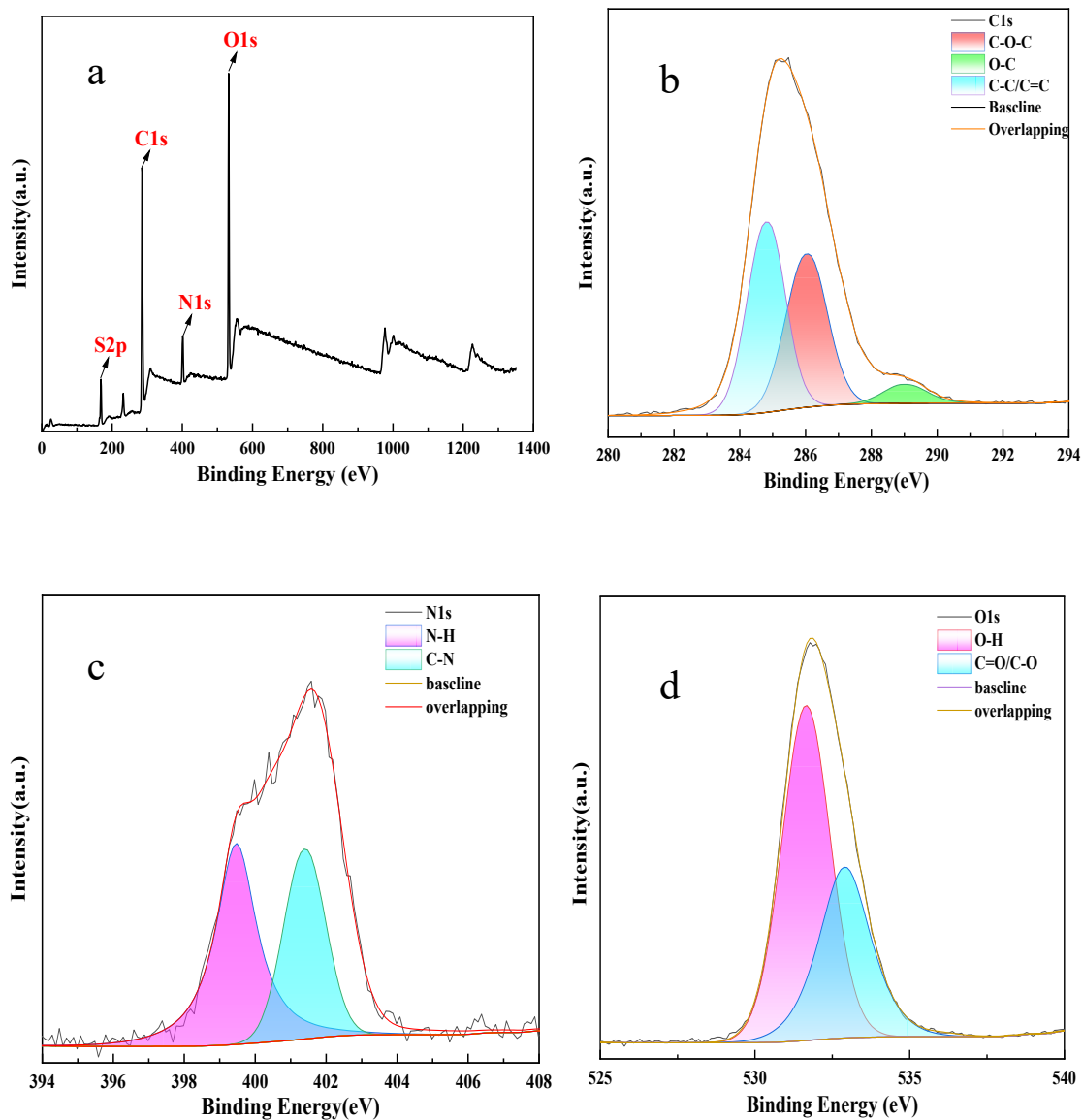
### Instruments and reagents

A Fourier transform infrared spectrometer (Perkin-Elmer, Massachusetts, USA), a D/Max-3c X-ray powder diffractometer (Rigaku corporation, Japan), a muffle furnace (Shenyang Energy-saving Electric Furnace Factory, Shenyang, China) and a Thermo fisher Talos 200 s transmission electron microscope (Thermo Scientific Company, Waltham, USA) were used.

### Material Characterization

To further verify the structure, surface composition and functional groups of the prepared N-CDs, X-ray electron spectroscopy (XPS) was used for the study. Before the curve resolution, the Shirley algorithm had been used to correct the background of a single core-level high-resolution XPS deconvolution spectrum, as shown in Fig. S1a. N-CDs showed four major peaks of 166.0 eV, 284.0 eV, 400.0 eV and 535.2 eV in the measurement spectrum, attributed to the S, C, N and O elements. The C 1s spectrum in Fig.S1b was deconvolution into three peaks, including the C-C/C=C (284.8 eV), C-O/C-N (286.2 eV), and C=O (288.0 eV) peaks. In the N 1s high-resolution spectrum (Fig. S1c), two peaks at 398.5 eV and 400.0 eV were shown, belonging to pyridine nitrogen and amino/pyrrole nitrogen respectively. In the 1s high-resolution spectrum of O (Fig. S1d), two peaks were observed at 531.5 eV and 532.5 eV, respectively

attributed to C=O and C-OH/C-O-C. The 2p high-resolution spectrum of S was shown in Fig. 2e. The peak at 164.0 eV indicates the presence of C-S bonds. The XPS results further confirmed the successful doping of N and the abundant oxygen/nitrogen-containing functional groups on its surface, which were consistent with the FTIR and TEM results, explaining its excellent optical properties and stability [1].



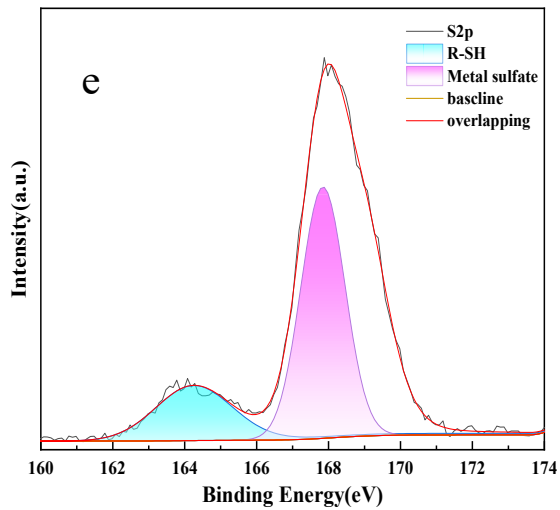


Fig.S1 XPS survey spectra of N-CDs

(a) XPS survey spectra of N-CDs; (b)- (e) C1s, N1s, O1s and S2p high-resolution spectrum of N-CDs

## References

- [1] Y. Wu, D. Qin, S. Meng, C. Zhang, B. Deng, Carbon quantum dots with blue/near infrared emissions for ratiometric fluorescent lornoxicam sensing and bio-imaging, *Microchimica Acta* 189 (2022) 157. <https://doi.org/10.1007/s00604-022-05262-0>.