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**Highly fluorescent N-doped carbon dots with two-photon emission
for ultrasensitive detection of tumor marker and visual monitor
anticancer drug loading and delivery**

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Abstract

Early diagnosis and therapy are practically important to effectively prevent cancer and improve patients' life quality. Herein, a simple and sensitive two-photon imaging fluorescent nitrogen-doped carbon dots (N-CDs) platform was constructed to detect β -glucuronidase (β G, a tumor-invasive biomarker) based on inner filter effect (IFE), to visually monitor anticancer drug loading by fluorescence resonance energy transfer (FRET), and to effectively treat cancer by chemotherapy. To build this sensing platform, novel N-CDs with strong green emission (Ca. QY=45%) were synthesized by one-pot pyrolysis reaction, and specifically, careful structure design of the excitation bands of N-CDs well covered the absorption bands of p-nitrophenol (PNP, β G catalytic product), making it ultra-sensitive towards the activity of β G and showing good linear relationship from 1 to 15 U/L and exciting detection limit of 0.3

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