Supplementary information

Molecularly imprinted fluorescent chemosensor synthesized using quinoline-modified-β-cyclodextrin as monomer for spermidine recognition

Yang Cheng [a,b], Ping Jiang[a] and Xiangchao Dong[a,b,*]

[a] College of Chemistry, Nankai University, Tianjin 300071, China;
[b] Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin 300071, China;
*Corresponding author: E-mail: xcdong@nankai.edu.cn

Characterization of β-CDOTS and quinolyl-β-CD with FT-IR analysis

FT-IR spectrum of β-CD (a), β-CDOTS (b) and quinolyl-β-CD (c) are shown in Fig. S1. In the infrared spectrum of β-CDOTS (b), characteristic bands of 1599 cm^{-1} ($\nu_{C=C}$, benzene ring), 1364 cm^{-1} ($\nu_{as\ S=O}$), 1177 cm^{-1} ($\nu_{s\ S=O}$), 1078 cm^{-1} (ν_{C-O-C}), 1028 cm^{-1} (ν_{C-O}), 837 cm^{-1} (δ_{C-H}, benzene ring) and 815 cm^{-1} (δ_{C-H}, benzene ring) appeared. The results have shown that the tosyl ester was successfully grafted on β-CD.

In the FT-IR spectrum (Fig. S1) of quinolyl-β-CD (c), the peaks of β-CDOTS (b) at 1364 cm^{-1} ($\nu_{as\ S=O}$) and 1177 cm^{-1} ($\nu_{s\ S=O}$) disappeared. The peaks of $\nu_{C=C}$ of aromatic ring at 1602 cm^{-1}, 1578 cm^{-1}, 1503 cm^{-1} and 1452 cm^{-1} appeared. The 824 cm^{-1} (δ_{C-H}, aromatic ring) and 788 cm^{-1} (δ_{C-H}, aromatic ring) also displayed. The results indicated that p-toluene sulfonyl group was substituted and the quinoline groups were grafted on β-CD.

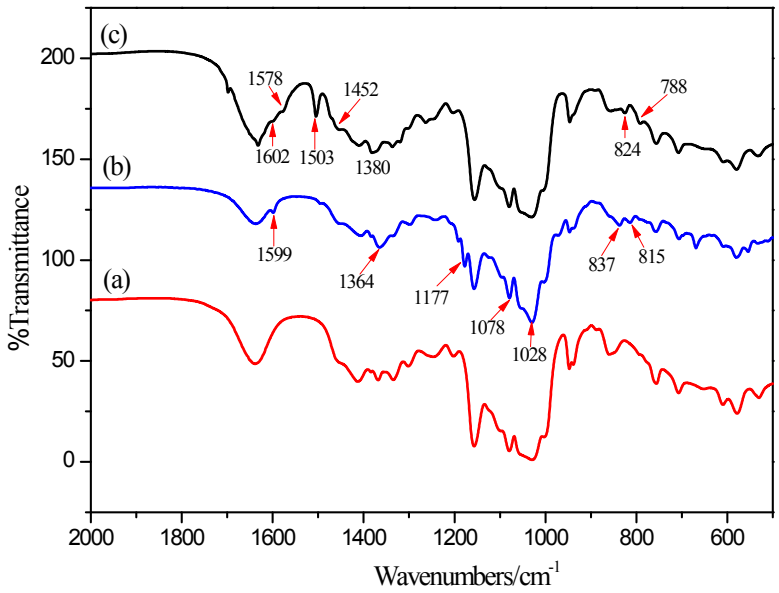

Fig. S1. FT-IR spectra of β-CD (a), β-CDOTS (b) and quinolyl-β-CD (c).

The figures S2, S3 and S4

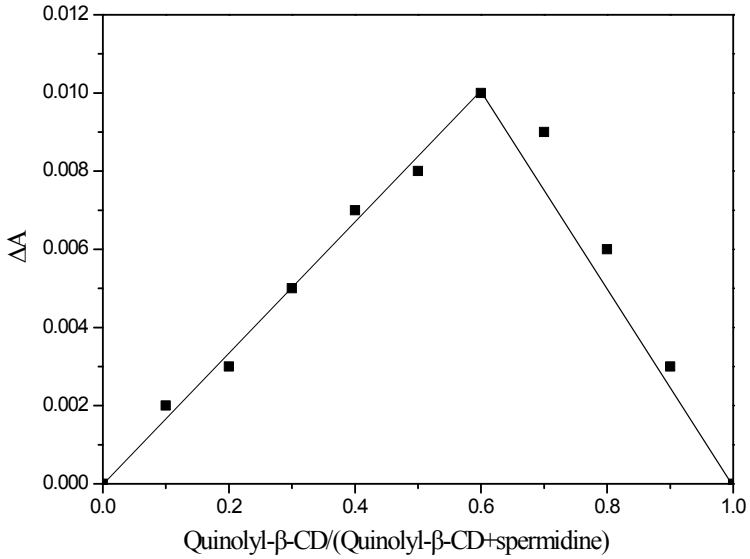

Fig. S2. Job's plot of quinolyl-β-CD/spermidine system (λ_{em} = 300 nm). (Total concentration of quinolyl-β-CD and spermidine was 5.0×10^{-5} mol·L^{-1}).

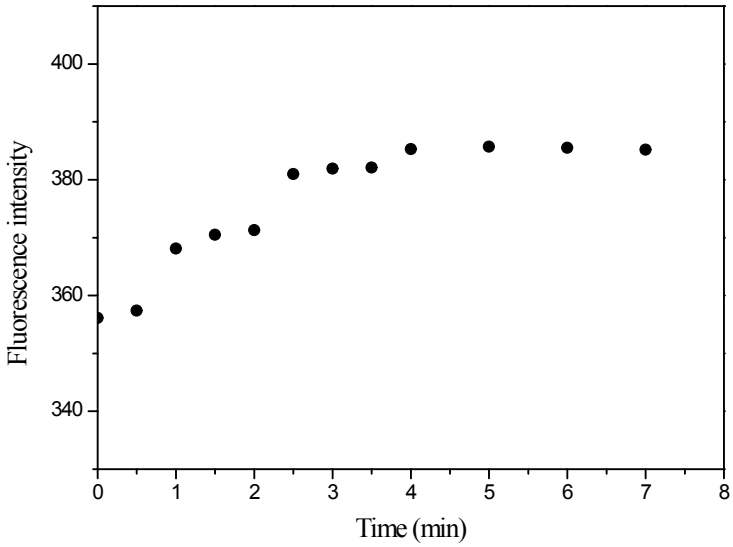

Fig. S3. The response of the imprinted chemosensor for spermidine solution (1.0×10^{-4} mol·L^{-1}) versus sample soaking time.

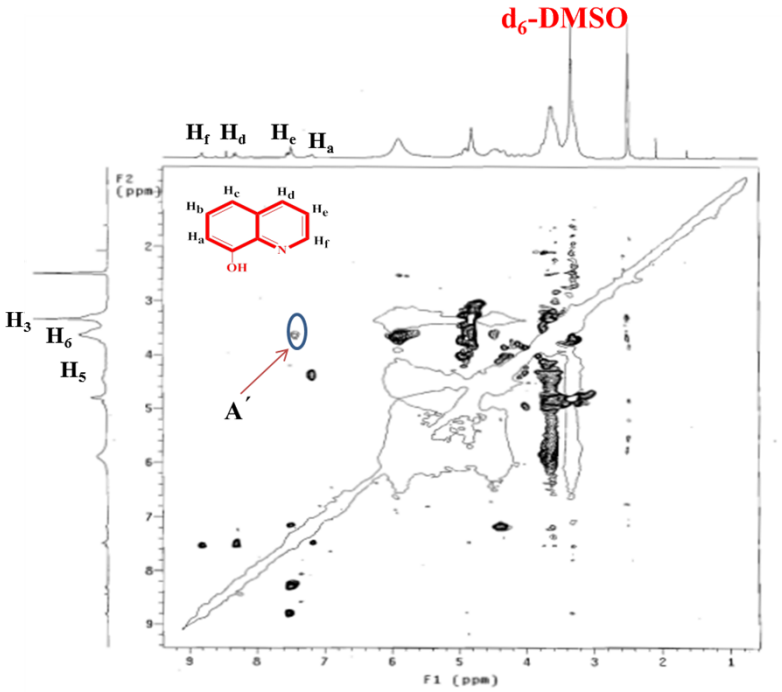

Fig. S4. 2D ^{1}H NMR ROESY spectrum of quinolyl-β-CD.