Supporting information

The Screening of Drug-induced Nephrotoxicity Using Gold Nanocluster-based Ratiometric Fluorescent Probes

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<table>
<thead>
<tr>
<th>Probes</th>
<th>$\lambda_{\text{ex}}$ (nm)</th>
<th>$\lambda_{\text{em}}$ (nm)</th>
<th>Linear range (μM)</th>
<th>Detection limit (μM)</th>
<th>Application</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMPTA-Tb$^{3+}$</td>
<td>320</td>
<td>545</td>
<td>0.1-10</td>
<td>0.27</td>
<td>cell</td>
<td>R1</td>
</tr>
<tr>
<td>DNA-AgNCs</td>
<td>440</td>
<td>550</td>
<td>0.05-5</td>
<td>-</td>
<td>cell</td>
<td>R2</td>
</tr>
<tr>
<td>AuNC@HPF</td>
<td>488</td>
<td>515 and 632</td>
<td>0-150</td>
<td>0.68</td>
<td>cell</td>
<td>R3</td>
</tr>
<tr>
<td>Si QDs–Ce6</td>
<td>410</td>
<td>490 and 660</td>
<td>1-200</td>
<td>0.97</td>
<td>cell</td>
<td>R4</td>
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<tr>
<td>GQD–hydroIR783</td>
<td>440</td>
<td>520 and 800</td>
<td>0–20</td>
<td>0.2</td>
<td>mice</td>
<td>R5</td>
</tr>
<tr>
<td>AuNCs-CS</td>
<td>440</td>
<td>600 and 740</td>
<td>0.5–40</td>
<td>0.014</td>
<td>mice</td>
<td>This work</td>
</tr>
</tbody>
</table>

Table S1: The photophysical properties of the fluorescent •OH probes.
Scheme S1 The synthetic scheme for the compound CS.
Figure S1 The size distribution of the AuNCs. Data were obtained by measuring 100 particles from the TEM images.
Figure S2 The fluorescence of AuNCs dispersed in different medium.
Figure S3 The fluorescence spectra of AuNCs upon addition of •OH (0-50 μM), ONOO\(^-\) (0-30 μM), H\(_2\)O\(_2\) (0-250 μM) or O\(_2^*\) (0-250 μM) in physiological saline solution. \(\lambda_{ex} = 440\) nm.
Figure S4 The fluorescence spectra of CS upon addition of different kinds of ROS, including •OH (0-250 μM), ONOO⁻ (0-50 μM), H₂O₂ (0-250 μM) and O₂⁻ (0-250 μM), in physiological saline solution (λ_{ex} = 440 nm).
Figure S5 The FT-IR spectra of AuNCs, CS and CS-modified AuNCs.
Figure S6 The absorption spectra of CS at different concentrations (6 to 60 μM).
**Figure S7** The TEM imaging of CS-modified AuNCs.
**Figure S8** The fluorescence spectra of CS-modified AuNCs with different concentrations of ONOO\(^{-}\) (1, 5, 10, 12.5, 15, 17 and 20 μM).
Figure S9 The fluorescent bioimaging of representative organs of mice after intravenous injection of AuNCs (He: heart; Ki: kidney; Sp: spleen; Li: liver; Lu: lung).
Figure S10  a) The representative fluorescence images for the mice injected with AuNCs-CS with different time. The normalized luminescence intensities of b) AuNCs, c) CS and d) the values of $F_{740}/F_{600}$ (n = 3 for each group).
**Figure S11** The H&E staining of heart, liver, spleen, lung and kidney of mice injected with saline or CS-modified AuNCs for 24 h.
Figure S12 The mass spectrum of the compound CS.
Figure S13 The $^1$H NMR spectra of the compound CS. $^1$H NMR (400 MHz, Chloroform-d) δ 8.56 (d, $J = 13.8$ Hz, 1H), 7.61 – 7.50 (m, 2H), 7.44 (d, $J = 7.2$ Hz, 2H), 7.37 (d, $J = 7.8$ Hz, 1H), 7.26 (s, 1H), 7.21 (d, $J = 7.3$ Hz, 1H), 7.15 (d, $J = 8.0$ Hz, 1H), 6.81 (d, $J = 9.2$ Hz, 1H), 6.67 (dd, $J = 28.6$, 9.2 Hz, 1H), 6.51 (d, $J = 2.3$ Hz, 1H), 6.03 (d, $J = 14.1$ Hz, 1H), 4.30 (t, $J = 6.7$ Hz, 2H), 3.68 (s, 3H), 3.63 (s, 3H), 3.49 (d, $J = 7.5$ Hz, 4H), 2.64 (d, $J = 12.5$ Hz, 1H), 2.53 (s, 2H), 2.33 (t, $J = 7.5$ Hz, 2H), 1.89 (d, $J = 13.2$ Hz, 1H), 1.81 (t, $J = 6.2$ Hz, 2H), 1.77 (s, 6H), 1.61 (t, $J = 7.6$ Hz, 2H), 1.30 (d, $J = 4.2$ Hz, 6H).
Figure S14 The $^{13}$C NMR spectra of the compound CS. $^{13}$C NMR (101 MHz, Chloroform-d) δ 167.93, 163.23, 155.85, 142.90, 140.81, 135.01, 133.08, 130.02, 129.53, 129.12, 128.89, 125.50, 122.44, 116.09, 113.46, 112.31, 110.69, 95.89, 49.42, 45.31, 32.04, 29.81, 29.48, 28.52, 27.12, 22.81, 12.53.

References: