Electronic Supplementary Information

Functionalized Gold and Persistent Luminescence Nanoparticles Based Ratiometric Absorption and TR-FRET Nanoplatform for High-throughput Sequential Detection of L-cysteine and Insulin

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Supplementary Notes

Insulin binding aptamer and it’s complementary sequence:

Insulin binding aptamer (IBA):
5’-COOH-TTTTTTGGTGGGTTGGGTTGGTAGGGTGTCTTC-3’

Partial complementary sequence 11 (CS):
5’-SH-C6-GAAGACACCCT-3’
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#### Table S1. Performance comparison of different methods for the detection of L-Cys.

<table>
<thead>
<tr>
<th>Methods</th>
<th>Liner range</th>
<th>Detection limit</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDs-Hg$^{2+}$ system</td>
<td>2–20 µM</td>
<td>0.29 µM</td>
<td>[S1]</td>
</tr>
<tr>
<td>MoS$_2$/PDDA-MC based sensor</td>
<td>0.45–155 µM</td>
<td>0.09 µM</td>
<td>[S2]</td>
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<tr>
<td>AuNCs–AuNPs probe</td>
<td>5.0 µM–0.5 mM</td>
<td>3.6 µM</td>
<td>[S3]</td>
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<tr>
<td>A single electrochemical biosensor</td>
<td>1–12 µM</td>
<td>480 nM</td>
<td>[S4]</td>
</tr>
<tr>
<td>Eu-GQDs</td>
<td>0.5–50 µM</td>
<td>0.31 µM</td>
<td>[S5]</td>
</tr>
<tr>
<td>BFCs based self-powered sensor</td>
<td>0.02–3 µM</td>
<td>10 nM</td>
<td>[S6]</td>
</tr>
<tr>
<td>FSN-capped AuNPs</td>
<td>0.2–3.0 µM</td>
<td>0.15 µM</td>
<td>[S7]</td>
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<tr>
<td>The developed method</td>
<td>0.01–5.5 µM</td>
<td>2.2 nM</td>
<td>This work</td>
</tr>
</tbody>
</table>

#### Table S2. Performance comparison of different methods for the detection of Ins.

<table>
<thead>
<tr>
<th>Methods</th>
<th>Liner range</th>
<th>Detection limit</th>
<th>Refs</th>
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</thead>
<tbody>
<tr>
<td>IBA-MMANs</td>
<td>2–1000 ng mL$^{-1}$</td>
<td>2.0 ng mL$^{-1}$</td>
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<tr>
<td>G-Quadruplex-based detection platform</td>
<td>80 pM–20 nM</td>
<td>80 pM</td>
<td>[S9]</td>
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<td>PEC sandwich transducer</td>
<td>0.01–50 ng mL$^{-1}$</td>
<td>2.8 pg mL$^{-1}$</td>
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<td>Insulin-EMMIPs</td>
<td>0.01–1 nM</td>
<td>3 pM</td>
<td>[S11]</td>
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<td>NIR-FRET-based on aptamer</td>
<td>1 pM–2 nM</td>
<td>0.6 pM</td>
<td>[S12]</td>
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<tr>
<td>Aptamer-mediated composite fluorescent probe</td>
<td>4.3–206.4 nM</td>
<td>2.74 nM</td>
<td>[S13]</td>
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<tr>
<td>Impedimetric sensor</td>
<td>1–1000 ng mL$^{-1}$</td>
<td>70 pg mL$^{-1}$</td>
<td>[S14]</td>
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<tr>
<td>The developed method</td>
<td>0.012–3.44 nM</td>
<td>2.06 pM</td>
<td>This work</td>
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References