Supporting Information

Covalent organic frameworks and electron mediator-based open circuit potential biosensor for in vivo electrochemical measurements

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**Table S1.** A comparison of the performance of various GOD-based glucose biosensors.

<table>
<thead>
<tr>
<th>Glucose sensors</th>
<th>Detection limit</th>
<th>Linear range</th>
<th>Sensitivity</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPE/GOx-SiO₂/Lig/Fc</td>
<td>145</td>
<td>0.5-9.0</td>
<td>0.78</td>
<td>S1</td>
</tr>
<tr>
<td>GOD/NCNTs/KSC</td>
<td>1.9</td>
<td>0.0058-18.0</td>
<td>29.4</td>
<td>S2</td>
</tr>
<tr>
<td>4-Amino thiophenol/AuNP/</td>
<td>5.4</td>
<td>0.0165-10.0</td>
<td>41.78</td>
<td>S3</td>
</tr>
<tr>
<td>GOD–HRP/MUA–MCH/Au</td>
<td>4.7</td>
<td>0.01-6.5</td>
<td>7.95</td>
<td>S4</td>
</tr>
<tr>
<td>GOD/ERGO–MWCNTs</td>
<td>4.7</td>
<td>0.01-6.5</td>
<td>7.95</td>
<td>S4</td>
</tr>
<tr>
<td>GOD/PVA-Au-pphTEOS</td>
<td>0.7</td>
<td>1.0-8.0</td>
<td>43.22</td>
<td>S5</td>
</tr>
<tr>
<td>GOD/graphene-chitosan</td>
<td>20.0</td>
<td>0.08-12.0</td>
<td>37.93</td>
<td>S6</td>
</tr>
<tr>
<td>GOD/Ag-Pdop@CNTs</td>
<td>17.0</td>
<td>0.05-1.1</td>
<td>3.1</td>
<td>S7</td>
</tr>
<tr>
<td>GOD/NECFE</td>
<td>0.36</td>
<td>0.00108-8.50</td>
<td>46.55*</td>
<td>This work</td>
</tr>
</tbody>
</table>

* This means that the units in such cases are (mV mM⁻¹ cm⁻²) instead of (μA mM⁻¹ cm⁻²)
Fig. S1. Nitrogen adsorption desorption isotherms of COF-LZU1 (cycles) and GOD/DMF/COF-LZU1 (triangles). Adsorption and desorption points are represented by big and little symbols, respectively.
**Fig. S2.** Pore size distribution of COF-LZU1 (squares) and DMFe/COF-LZU1 (rounds).
Fig. S3. $V_{oc}$-t curves obtained at GOD/COF-LZU1/CFMEs in the absence (a) and presence of 1.0 (b), 2.0 (c) and 3.0 mM (d) glucose in nitrogen saturated aCSF (pH7.4), respectively.
Fig. S4. Schematic illustration of GOD/COF-LZU1/CFMEs catalyzing glucose without mediator.
Fig. S5. $V_{oc}$-t curves obtained at GOD/DMFc/CFMEs in the absence (a) and presence of 1.0 (b), 2.0 (c) and 3.0 mM (d) glucose in nitrogen saturated aCSF (pH7.4), respectively.
Fig. S6. $V_{oc}$-t curves obtained at GOD/DMFc/COF-LZU1/CFMEs in the absence (a) and presence of 1.0 (b), 2.0 (c) and 3.0 mM (d) glucose in nitrogen saturated aCSF (pH7.4), respectively.
Fig. S7. The electrochemical response of GOD/DMFc/COF-LZU1/CFMEs and GOD/DMFc/CFMEs in the absence (a) and presence of 1.0 (b), 2.0 (c) and 3.0 mM (d) glucose in nitrogen saturated aCSF (pH7.4), respectively.
Fig. S8. CVs of the GOD/DMFc/COF-LZU1/CFMEs in the absence (a) and presence of 1.0 (b), 2.0 (c) and 5.0 mM (d) glucose in pH 7.4 nitrogen saturated aCSF at 100 mV s⁻¹, respectively.
Fig. S9. Schematic illustration of GOD/DMFc/COF-LZU1/CFMEs catalyzing glucose.
Fig. S10. The electrochemical response of the different GOD/DMFc/COF-LZU1/CFMEs in aCSF (pH7.4) containing 1.0 mM glucose to different 1,3,5-Triformylbenzene concentrations.
Fig. S11. SEM images of the GOD/DMFc/COF-LZU1/CFMEs prepared by (A) 5 mg ml\(^{-1}\) (B) 10 mg ml\(^{-1}\) (C) 16 mg ml\(^{-1}\) (D) 25 mg ml\(^{-1}\) 1,3,5-Triformylbenzene, and the concentration ratio of 1,3,5-Triformylbenzene and 1,4-diaminobenzene is 1:1.
Fig. S12. The electrochemical response of the different GOD/DMFc/COF-LZU1/CFMEs in aCSF (pH7.4) containing 1.0 mM glucose to different soaking time in DMFc saturated solution.
Fig. S13. The electrochemical response of the GOD/DMFc/COF-LZU1/CFMEs in aCSF (pH7.4) containing 1.0 mM glucose to different GOD solution.
Fig. S14. The electrochemical response of the different GOD/DMFc/COF-LZU1/CFMEs in aCSF (pH7.4) containing 1.0 mM glucose to different soaking time in 65 μM GOD solution.
Fig. S15. Time-dependent signal response of GOD/DMFc/COF-LZU1/CFMEs for 1 mM glucose.
Fig. S16. Stability test of the GOD/DMFc/COF-LZU1/CFMEs in determination of 2.0 mM glucose in 30 days.
References


