Supporting Information

One-piece Lateral Flow-through Impedimetric Testing Strip for Label-free Detection of Clenbuterol Hydrochloride

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sFig.1 The FTIR of polyaniline (PANI) and polyaniline-graphene (PANI@GO) nanocomposites

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**sFig.2** On-strip direct immunoassay of anti-clenbuterol mAb and OVA-clenbuterol functionalized working electrode (n=3)

**Table 1** Comparison of PANI-based biosensors

<table>
<thead>
<tr>
<th>Sensing material</th>
<th>Synthesis method</th>
<th>Material composition</th>
<th>Morphology</th>
<th>Application</th>
<th>Label-free</th>
<th>device</th>
<th>Disposable</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANI@GO/ITO</td>
<td>One-step co-deposition with constant current: 6mA/cm² 3min and 3mA/cm² 15min</td>
<td>0.3M aniline 0.4mg/mL GO 1M HClO₄</td>
<td>Nanowires</td>
<td>Immune sensor</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>a</td>
</tr>
<tr>
<td>PANI/Au/PWE</td>
<td>Seeds growth AuNPs, 20 cycles of CV in a potential range of -0.1-0.8V at scan rate of 50 mV·s⁻¹</td>
<td>10µL growth aqueous solution, 10µM aniline 0.1M H₂SO₄</td>
<td>Nanofibers</td>
<td>Immune sensor</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>[1]</td>
</tr>
<tr>
<td>Concanavalin A/PANI/SWE</td>
<td>Constant potential of 2.0 mV 2min, using glutaraldehyde as a cross linker for immobilizing Concanavalin A</td>
<td>Aniline 1M H₂SO₄, 200µg/mL Concanavalin A</td>
<td>Detection of bacterial toxin</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>[2]</td>
<td></td>
</tr>
<tr>
<td>HRP/GO@PANI/ITO</td>
<td>CV in a potential range of 2.0-1.1V at scan rate of 20 mV·s⁻¹, using glutaraldehyde as a cross linker for immobilizing HRP</td>
<td>0.2M aniline 50µL GO 1M HCl, 1mg/mL HRP</td>
<td>Porous matrix</td>
<td>Detection of artesunate</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>[3]</td>
</tr>
<tr>
<td>AuNPs/PANI/C/GS/GCE</td>
<td>Dropped 5µL CS-GS solution, 6 cycles of CV in a potential range of -0.2-1.0V at scan rate of 50 mV·s⁻¹, deposition of AuNPs at potential of -0.2 V for 100 s</td>
<td>CS-GS, 0.15 M aniline 0.5M H₂SO₄, 3 mM HAuCl₄ 0.1 M KNO₃</td>
<td>DNA sensor</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>[4]</td>
<td></td>
</tr>
<tr>
<td>PANI/GO/GCE</td>
<td>Dropped 6µL GO solution, three-step electrochemical deposition: 0.06 mA/cm² 0.5h, 0.03 mA/cm² 3h, 0.015 mA/cm² 3h</td>
<td>2mg/mL GO, 0.5 M aniline 1M HCl</td>
<td>Nanowires</td>
<td>DNA sensor</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>[5]</td>
</tr>
</tbody>
</table>
This work; ITO: indium tin oxide; GCE: glass carbon electrode; SPE: screen printed electrode; EIS: electrical impedance spectroscopy; CV: cyclic voltammetry; DPV: differential pulse voltammetry; LSV: linear sweep voltammetry; GCE: glass carbon electrode; PWE: paper work electrode; SWE: steel work electrode.

Reference