(Supporting Information)

Simultaneous determination of neurotransmitters and neuroprotector in human blood serum and urine samples using diazonium grafted gold nanoparticles film electrode

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**Figure S1.** Absorption spectrum obtained for AP-AuNPs. *Inset:* Photographic images of AP-AuNPs.
Figure S2. HR-TEM images for AP-AuNPs: (A) low magnification, (B) high magnification, (C) selected area electron diffraction pattern and (D) particle size distribution histogram.
Scheme S1. Schematic representation of the stabilization of AP-AuNPs.
Figure S3. Potentiodynamic formation of AP-AuNPs film (30 cycles) on GC electrode in AP-AuNPs containing 100 μM H₂SO₄ at a scan rate of 50 mV s⁻¹.
Figure S4. Potentiodynamic formation of AP-AuNPs film (30 cycles) on ITO electrode in AP-AuNPs containing 100 µM H$_2$SO$_4$ at a scan rate of 50 mV s$^{-1}$. 
Figure S5. (A) CVs obtained for 0.5 mM GN at (a) bare GC and (b) AP-AuNPs film modified electrodes in 0.2 M PB solution (pH 7.2) at a scan rate of 50 mV s\(^{-1}\) (1st cycle: solid line; 5th cycle: dotted line). CV obtained in the absence of GN (c) at AP-AuNPs film modified electrode in PB solution at pH 7.2 at a scan rate of 50 mV s\(^{-1}\).

(B) CVs obtained for 0.5 mM AD at (a) bare GC and (b) AP-AuNPs film modified electrodes in 0.2 M PB solution (pH 7.2) at a scan rate of 50 mV s\(^{-1}\). (B) CVs obtained for 0.5 mM AD at (a) bare GC and (b) AP-AuNPs film modified electrodes in 0.2 M PB solution (pH 7.2) at a scan rate of 50 mV s\(^{-1}\) (1st cycle: solid line; 5th cycle: dotted line). CV obtained in the absence of AD (c) at AP-AuNPs film modified electrode in PB solution at pH 7.2 at a scan rate of 50 mV s\(^{-1}\).
Figure S6. CVs obtained for 0.5 mM (A) DA, (B) GN and (C) AD at AP-AuNPs film modified electrode in 0.2 M PB solution (pH 7.2) at scan rates of (a) 0.05, (b) 0.075, (c) 0.1, (d) 0.125, (e) 0.15, (f) 0.175, (g) 0.2, (h) 0.225 and (i) 0.25 Vs⁻¹. Insets: Plot of the anodic peak current vs. square root of scan rate.
**Figure S7.** (A) Amperometric $i$-$t$ curve for the determination of GN at AP-AuNPs film modified electrode in 0.2 M PB solution (pH 7.2). Each addition increases the concentration of 70 nM of GN at regular interval of 50 s. $E_{\text{app}} = +1.2$ V. **Inset (a):** Plot of concentration of GN vs. current. (B) Amperometric $i$-$t$ curve for the determination of GN at AP-AuNPs film modified electrode in 0.2 M PB solution (pH 7.2). Each addition increases the concentrations of (a) 0.07 (b) 0.1 (c) 0.2 (d) 0.5 (e) 1 (f) 2 (g) 5 (h) 10 (i) 20 and (j) 50 µM GN at AP-AuNPs film modified electrode in 0.2 M PB solution (pH 7.2) at a regular interval of 50 s. $E_{\text{app}} = +1.2$ V. **Inset (b):** Plot of concentration of GN vs. current.
Figure S8. DPVs obtained for 1 μM of DA, 10 μM of GN and 10 μM of AD in the presence of each 200 μM AA and UA at AP-AuNPs film modified electrode in 0.2 M PB solution.
Table S1

Simultaneous determination of DA, GN and AD in human blood serum and urine samples

<table>
<thead>
<tr>
<th>Samples</th>
<th>Added (µM)</th>
<th>Found (µM) and (Recoveries)</th>
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<tbody>
<tr>
<td></td>
<td>DA</td>
<td>GN</td>
</tr>
<tr>
<td>Serum 1</td>
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<td>120</td>
</tr>
<tr>
<td>Serum 2</td>
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<td>100</td>
</tr>
<tr>
<td>Urine 1</td>
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<td>50</td>
</tr>
<tr>
<td>Urine 2</td>
<td>15</td>
<td>50</td>
</tr>
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