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Supporting material

Simple approach for the immobilization of horseradish peroxidase on Poly-L-histidine modified reduced graphene oxide for amperometric determination of Dopamine and H_2O_2

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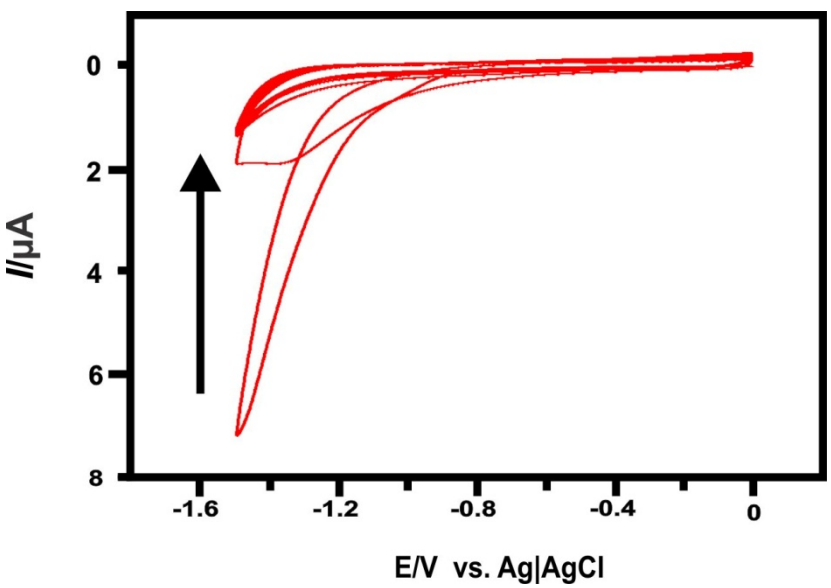

Fig. S1. Cyclic voltammograms of the reduction process of GO on GCE in 0.05 M of the pH 5 PBS containing 10 mM P-L-His); scan rate: 50 mV s^{-1}.

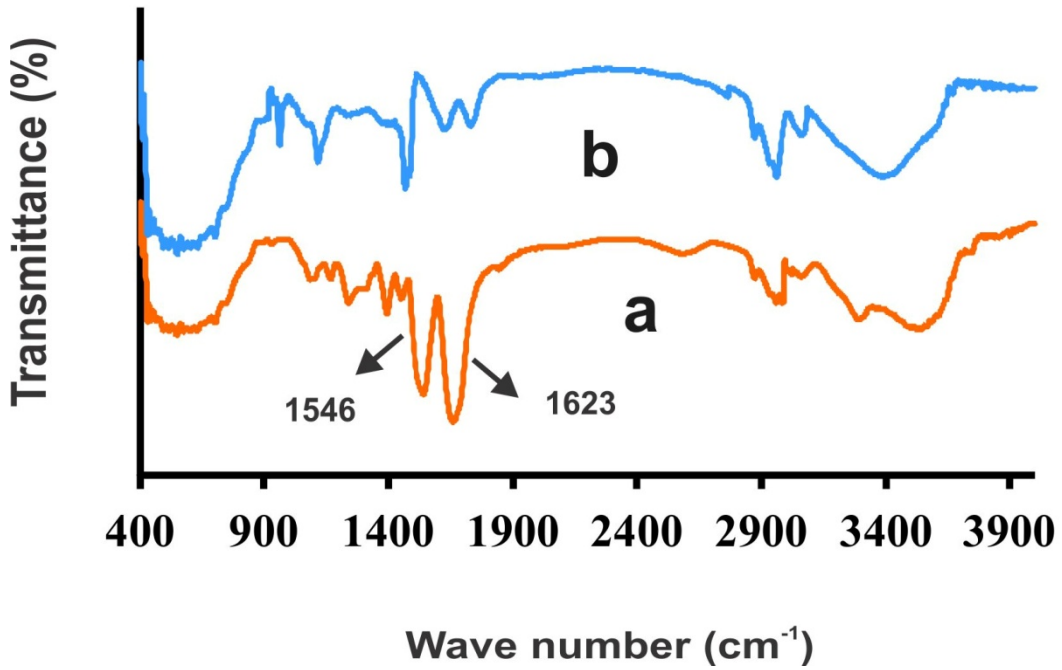

Fig. S2. FTIR spectra of (a) GO, and (b) P-L-His-RGO.

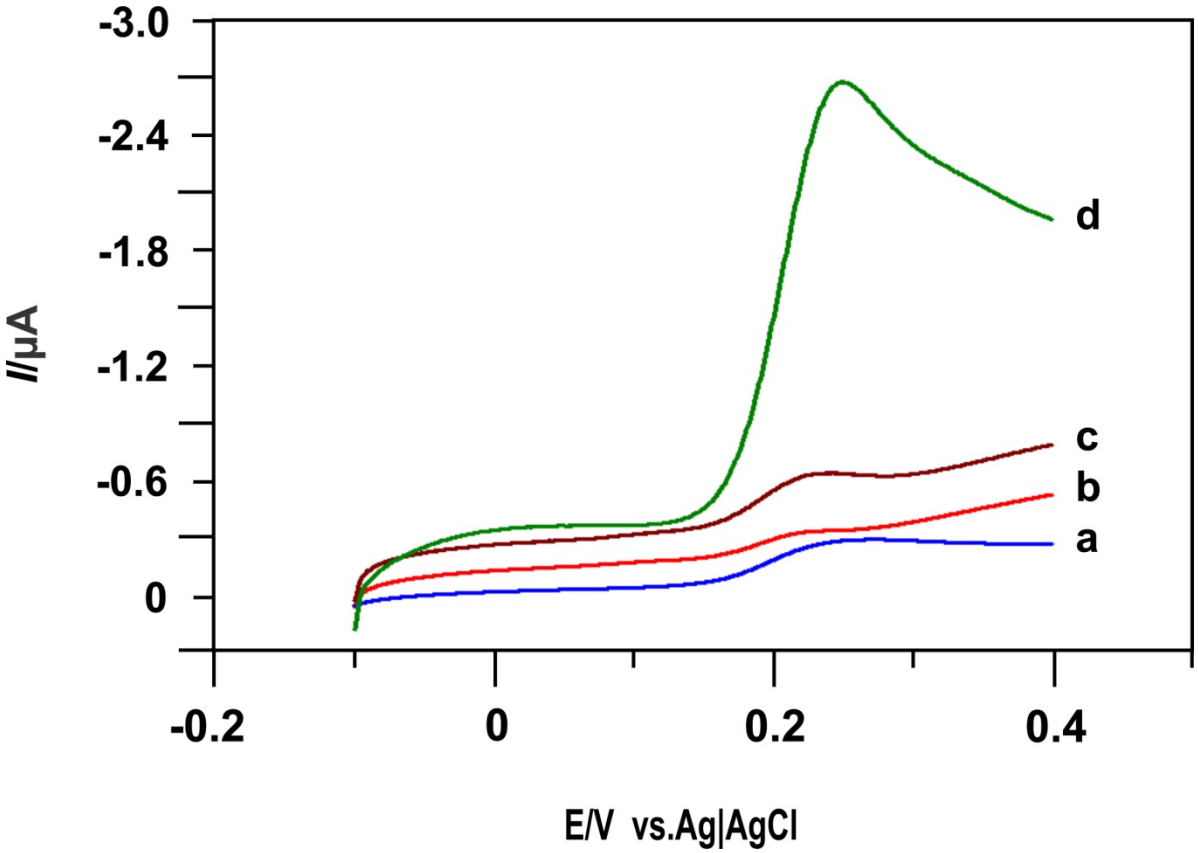

Fig. S3. Linear sweep voltammetric measurements for 3mM DA in 0.05 M PBS on the (a) bare GCE, (b) RGO modified GCE electrodes, (c) P-L-His-RGO modified GCE electrodes, (d) HRP/P-L-His-RGO modified GCE electrodes. Scan rate: 0.5 V s^{-1}.

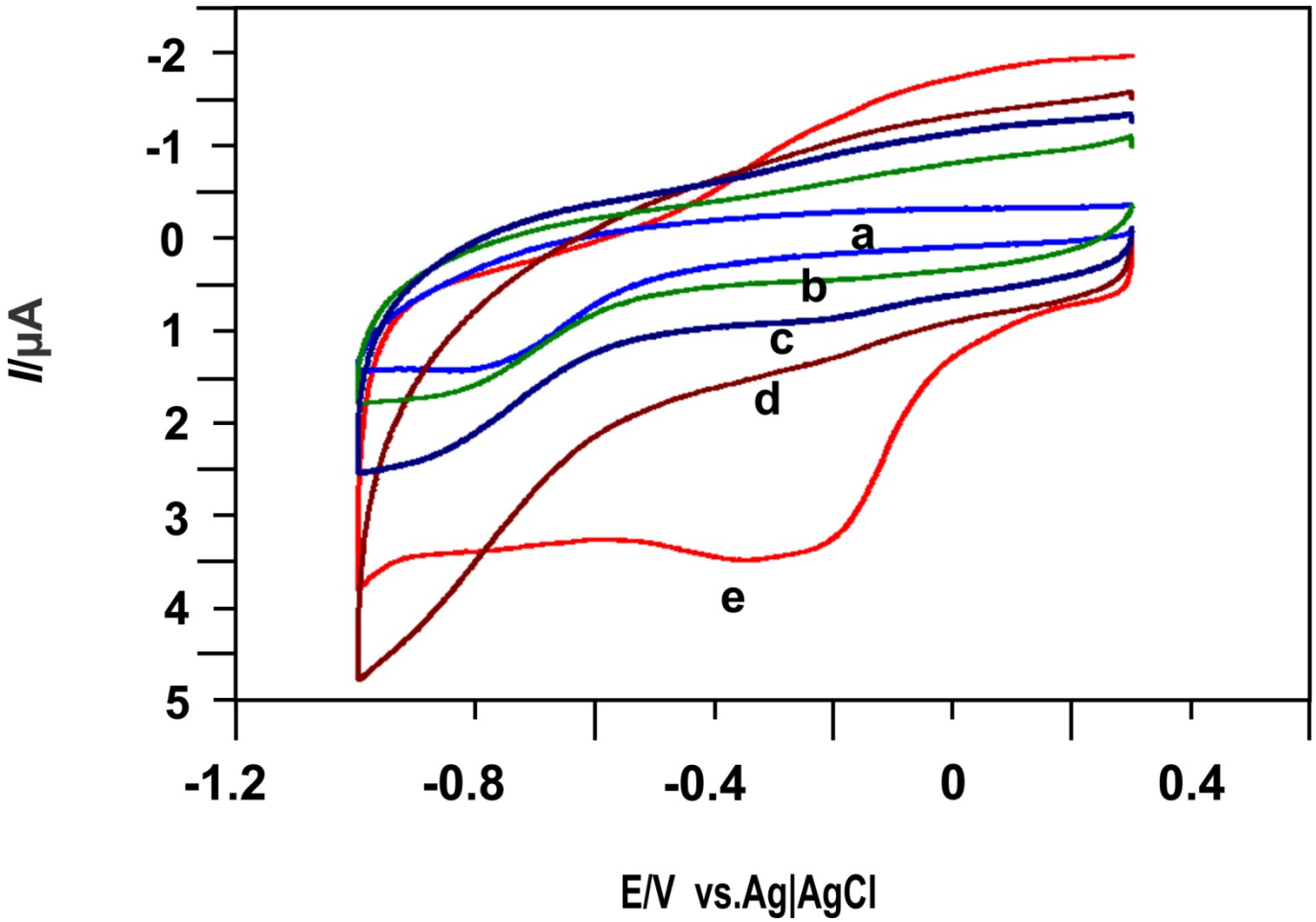

Fig. S4. CVs of 3mM H_2O_2 in 0.05 M PBS on the (a) bare GCE, (b) RGO modified GCE electrodes, (c) P-L-His modified GCE electrodes, (d) P-L-His-RGO modified GCE electrodes, (e) HRP/P-L-His-RGO modified GCE electrodes. Scan rate: 0.5 V s^{-1}.

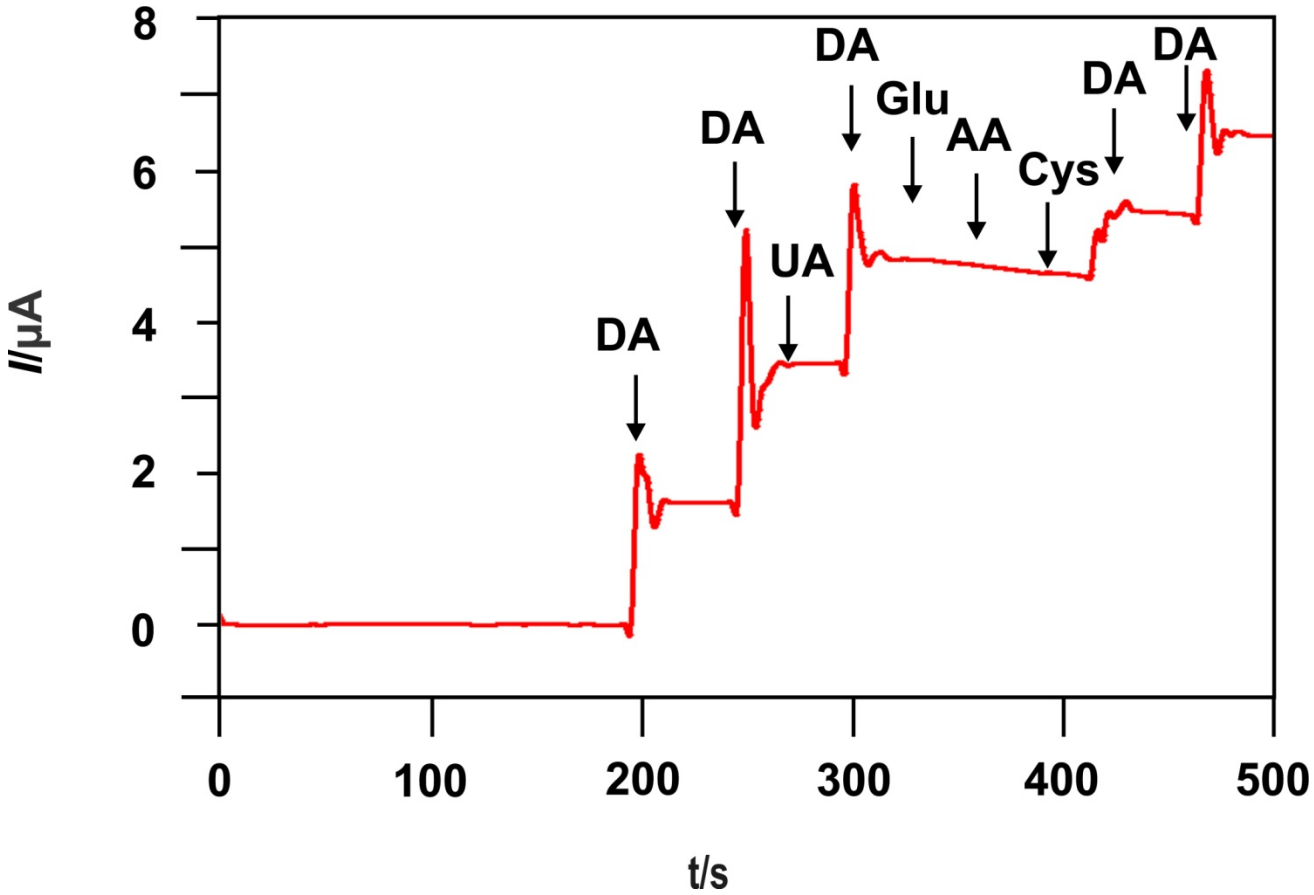

Fig. S5. Amperometric response of the HRP/P-L-His-RGO modified rotating disc GCE electrodes to 100 μM DA in the presence of some coexisting compounds (100 μM ascorbic acid (AA), 100 μM glucose (Glu), 100 μM uric acid (UA), and 100 μM cysteine (Cys) in the 0.05 M phosphate buffer solution (pH 7.0); applied potential: +0.23 V.

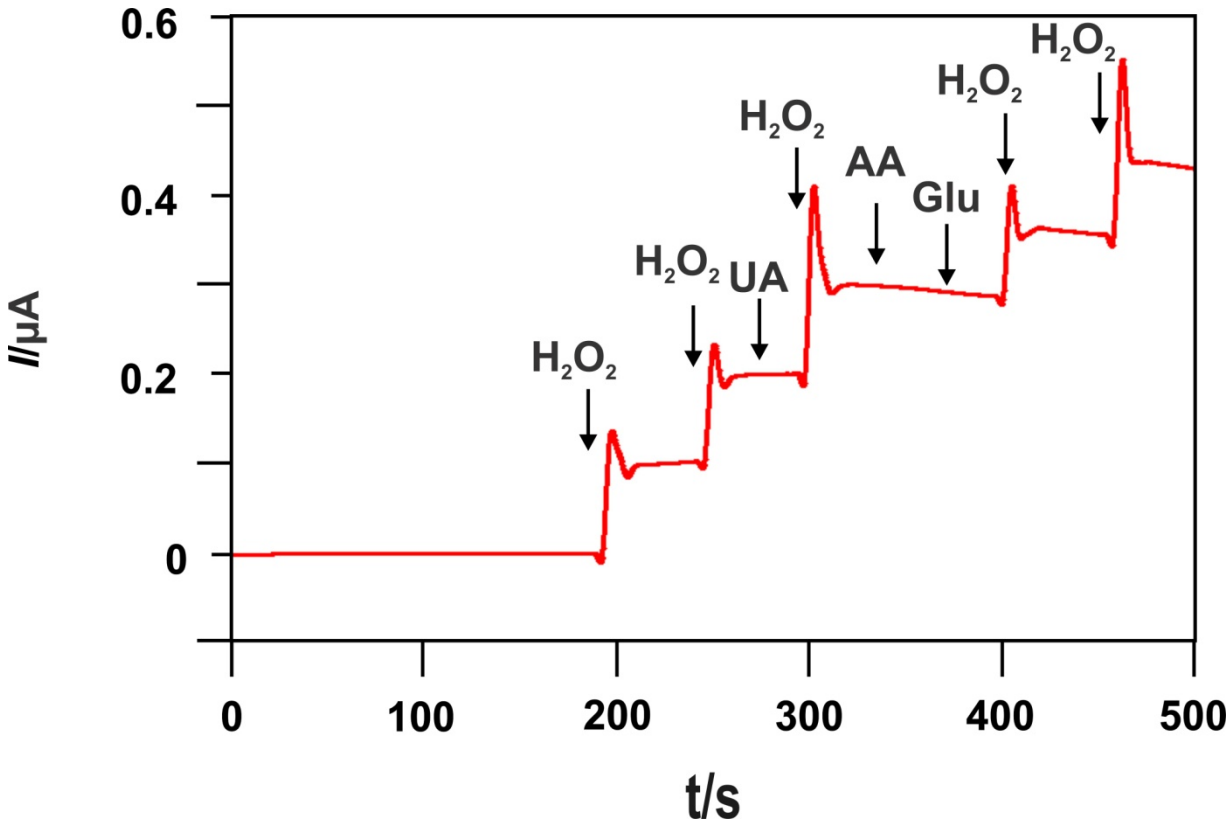

Fig. S6. Amperometric responses of the HRP/P-L-His-RGO modified rotating disc GCE electrodes upon addition of 100 μM of H_2O_2, 100 μM ascorbic acid (AA), 100 μM uric acid(UA), and 100 μM glucose (Glu) solutions into a continuously stirred N_2 saturated 0.05 M phosphate buffer solution (pH 7.0); applied potential: -0.2 V.

Table S1

Comparison of the performance of different modified electrodes used in the electrocatalysis of dopamine.

Modified electrodes	**Method**	**Linear range μM**	**LOD μM**	**Ref**
Reduced graphene oxide/Pd-NPs	LSV	1 to 150	0.233	[1]
Graphene	DPV	4 to 100	2.64	[2]
Graphene-layered double hydroxid	SWV	1 to 199	0.3	[3]

Cu_2O/Graphene	CV	0.1 to 10	0.01	[4]
Au-NPs/polyaniline	Amperometry	3 to 115	0.8	[5]
Calix[4]arene crown-4 ether/GCE	CV	20-1000	3.4	[6]
Polychromotrope 2B/GCE	DPV	2-80	0.3	[7]
Poly(sulfosalicylic acid)/GCE	DPV	0.55-22 and 22-110	0.005	[8]
MWCNT/b-CD/GCE	CV	10-80	37	[9]
Nanocuprous oxide-methylene blue composite/GCE	CV	0.1-320	0.046	[10]
Graphene/carbon fiber microelectrode	CV	0.01-100	0.01	[11]
Cysteamine-MWCNT/gold electrode	DPV	0.2-100	0.02	[12]
HRP-MWCNTs- silica sol-gel /Poly glycine / carbon paste electrode	DPV	15-165	0.6	[13]
HRP-PEGylated polyurethane (PU-PEG)	SWV	17-1900	2.0	[14]
HRP/P-L-His-RGO/ GCE	Amperometry	0.2-12000	0.42	**This work**

Table S2.

Determination of dopamine in urine and serum samples

Samples	**Added [μM]**	**Found [μM]**	**Recovery (%)**
Urine sample	5	4.4	99.2
	10	10.2	103.1
Serum sample	5	4.8	103.6
	10	9.6	104.1

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