Electronic Supplementary Information for

Synthesis of Carbon Nanoparticle Embedded Graphene for Sensitive and Selective Determination of Dopamine and Ascorbic acid in Biological Fluids

Sudip Biswas[1], Rashmita Das[1], Malini Basu[1], Rajib Bandyopadhyay[1], Panchanan Pramanik[2]

[1]Department of Instrumentation and Electronics Engineering, Jadavpur University,

Salt Lake Campus, Sector-III, Kolkata-700098

[2] Department of Chemistry and Nanoscience, GLA University, Mathura-281 406, India

Email: pramanik1946@gmail.com

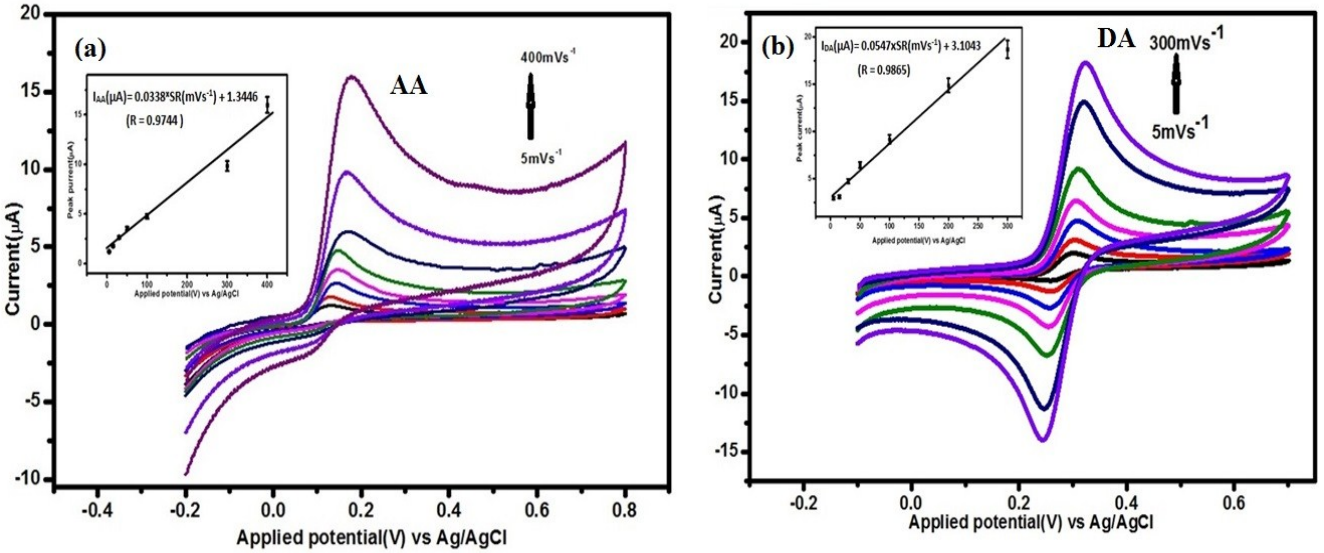

Figure S1. CVs for the oxidation of (a) AA and (b) DA CNEG/GP electrode in 0.1 M PBS (pH 6.0) at different scan rates. Insets: plots of the anodic peak current vs. scan rate.

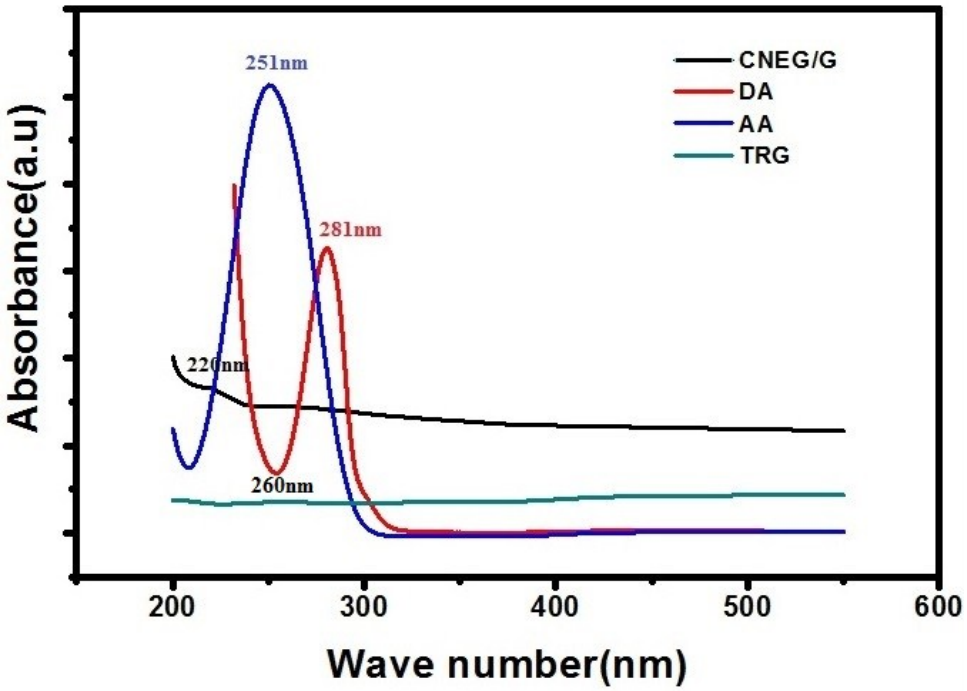

Figure S2. UV-VIS spectra of AA, DA, CNEG/G, TRG in water as a solvent.

Table S1. EDS analysis of CNEG

Sample	N in atomic %	C in atomic %	O in atomic %
CNEG	13.25	66.95	5.49

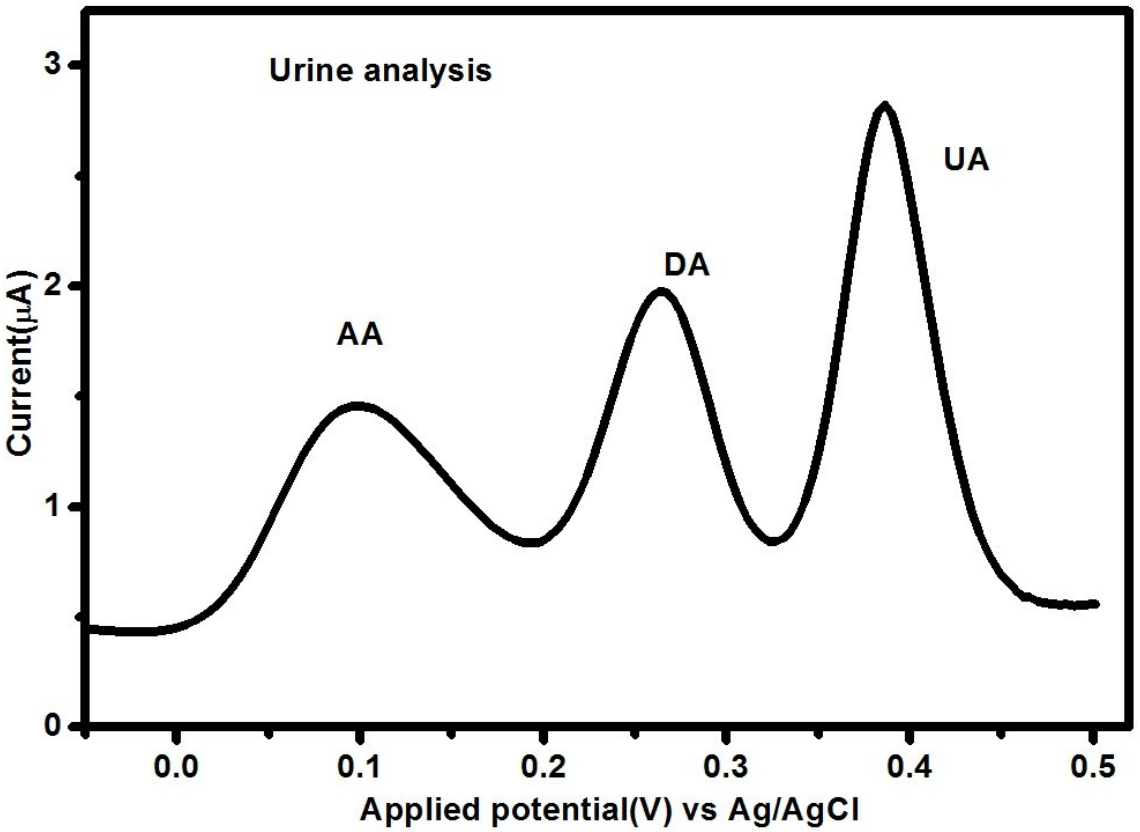

Figure S3. Urine analysis at CNEG/GP electrode in 0.1(M) PBS of pH 6

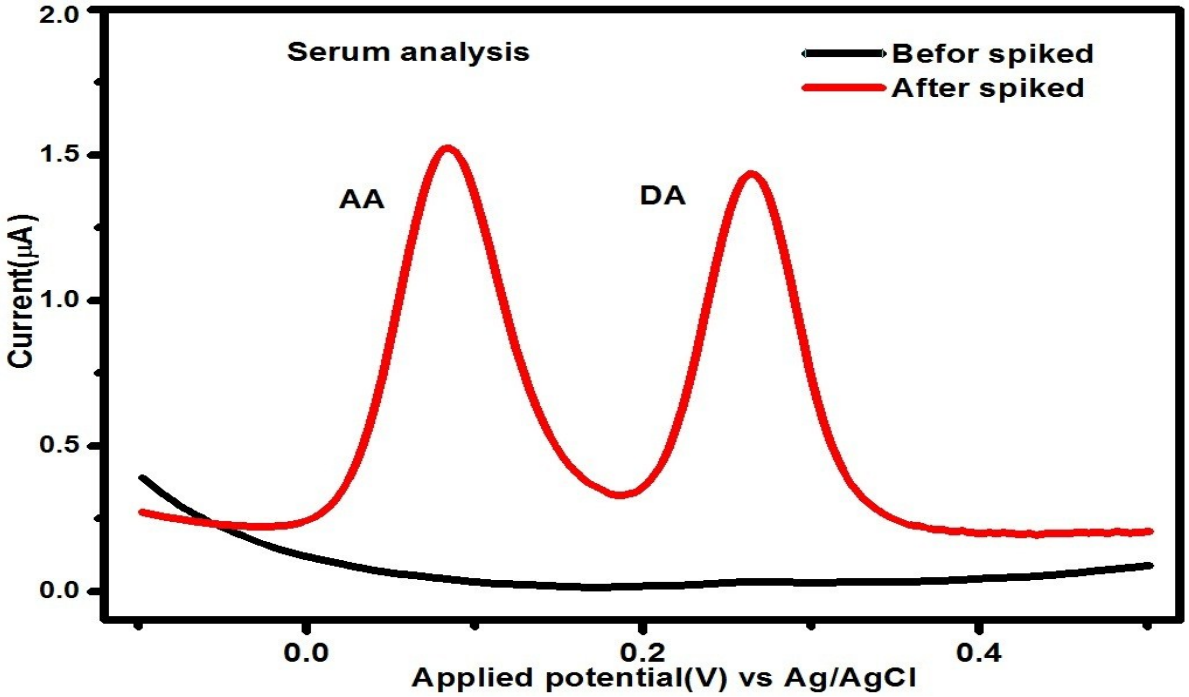

Figure S4. Human serum analysis at CNEG/GP electrode in 0.1(M) PBS of pH 6

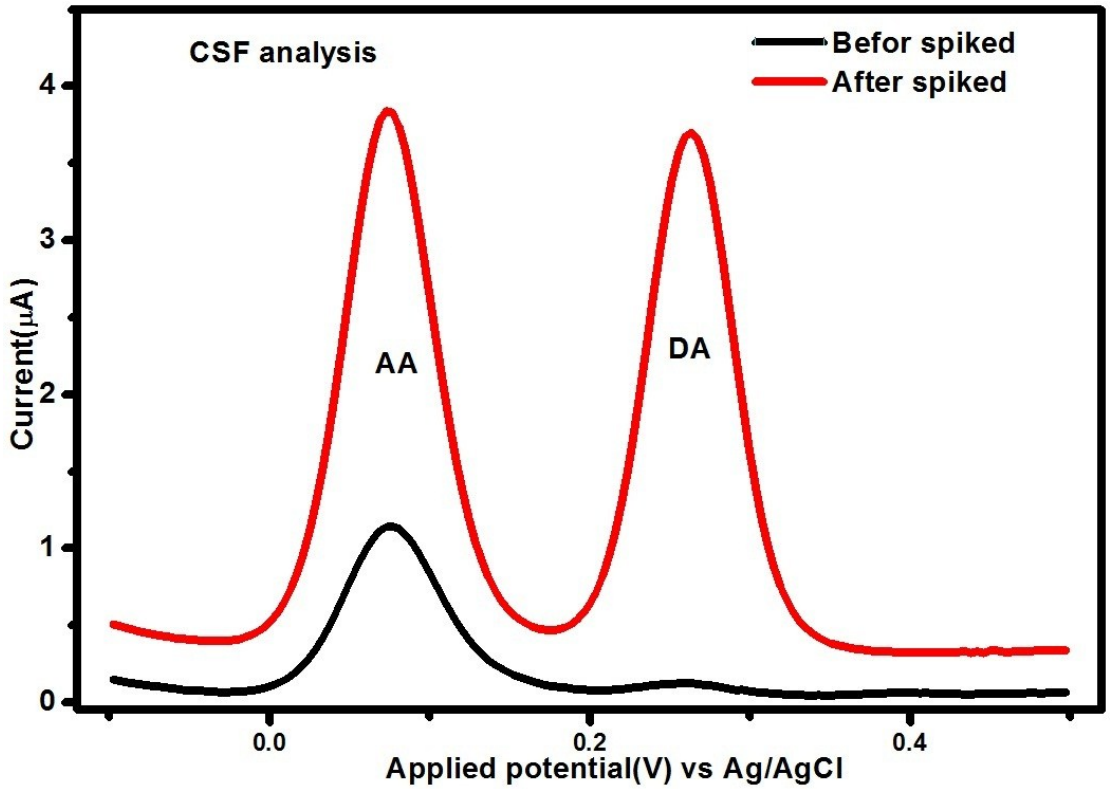

Figure S5. Cerebrospinal fluid (CSF) analysis at CNEG/GP electrode in 0.1(M) PBS of pH 6

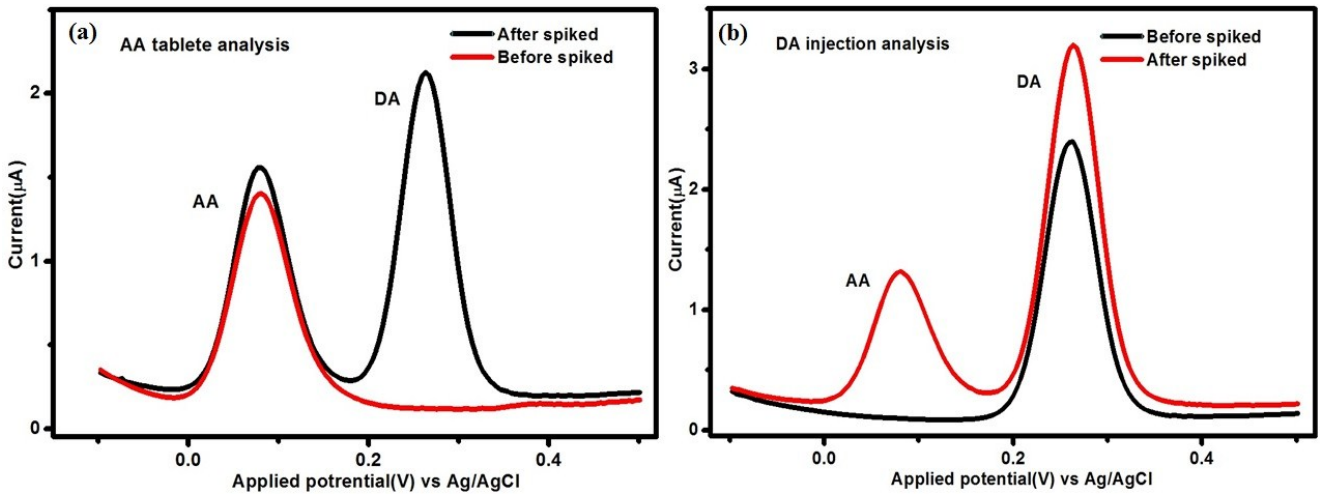

Figure S6. Drugs analysis at CNEG/GP electrode in 0.1(M) PBS of pH 6 (a) Ascorbic acid(AA) tablet and (b) Dopamine (DA) injection

Table S2. Determination of AA and DA in urine sample using CNEG/GP (n=3)

Urine Sample	Diluted sample(μM)	Spiking(μM)	Found(μM)	R.D.S[a] (%)	Recovery[b] (%)
DA	0	40	39.1	2.8	97.7
AA	0	60	60.6	1.4	101.0
Human serum sample					
DA	0	25	25.1	1.2	100.4
AA	0	65	64.9	2.1	99.8
Cerebrospinal fluids					
DA	0.075[c]	80	81.6	1.9	101.0
AA	59[c]	160	219.5	3.1	100.3

Table S3. Analysis of AA and DA in pharmaceutical samples (n=3)

	Content(μM)	Spiking(μM) AA	Spiking(μM) DA	Found(μM)	R.D.S[a](%)	Recovery[b](%)
AA Tablet	57.0[c]	10	50	67.3	1.6	103.0
DA injection	44.3[c]	40	25	69.1	1.8	99.2

[a]Relative standard deviation

[b]Recovery = $\frac{Found(\mu M) - Diluted\ biologial\ fluids/pharmaceutical\ sample(\mu M)}{Spiking(\mu M)} \times 100\%$

[c]Average of three consecutive measurement (R.D.S = 3.6% for urine sample and 1.2% for serum sample)