Electronic Supporting information

Carbon nitride quantum dots tethered CNT for electrochemical detection of dopamine and uric acid

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1. SEM images of g-C_3N_4 and CNNSs

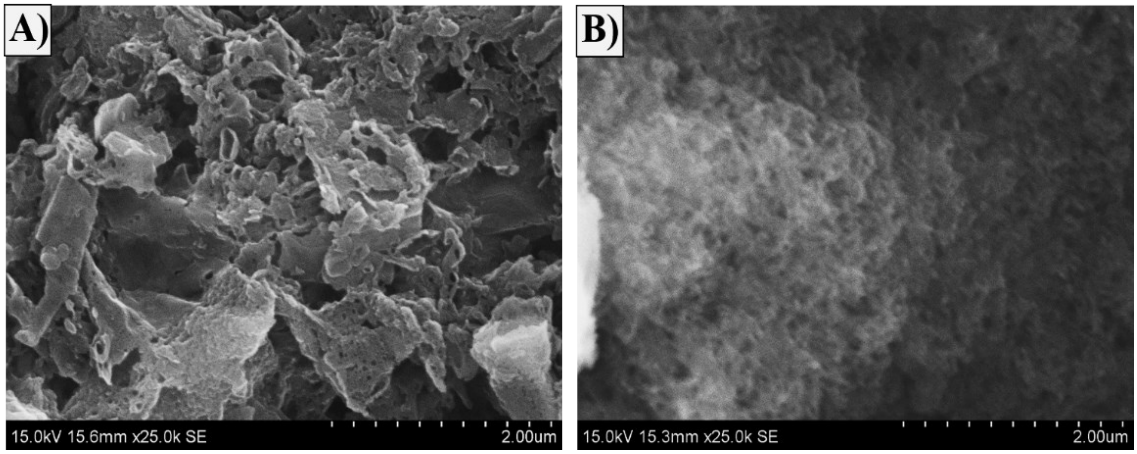

Fig. S1. SEM images of g-C_3N_4 (A) and CNNSs (B)

2. **DPVs of various concertation's of DA in the presence of 1mM AA and 10µM UA at *f*-CNT/GCE.**

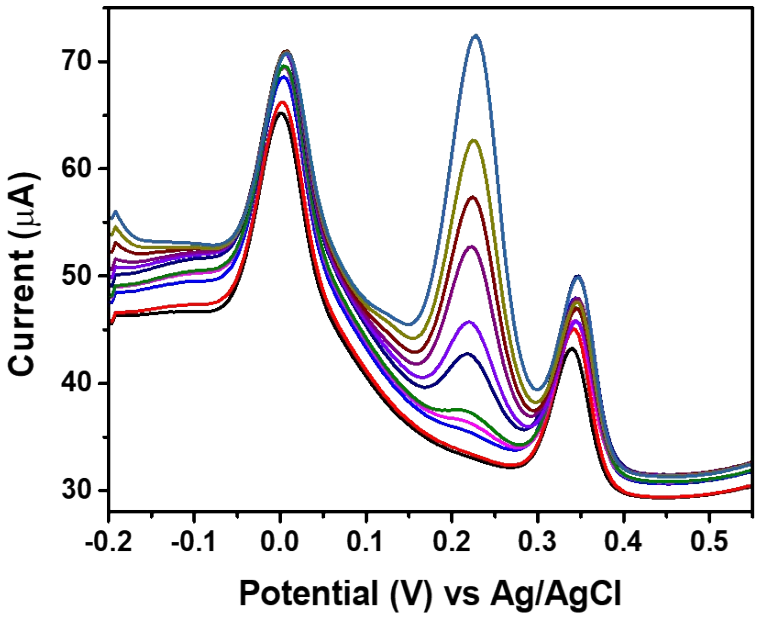

Fig. S2. DPVs of various concertation's of DA (50 nM, 100 nM, 400 nM, 700 nM, 1µM, 3 µM, 5 µM, 7 µM, 9 µM, 11 µM and 13 µM) in the presence of 1mM AA and 10µM UA at *f*-CNT/GCE.

3. Optimization of detection conditions.

Response of current and potential of 0.1 mM DA and 0.15 mM UA at CNQDs/*f*-MWCNT/GCE towards different pH.

The slope value obtained for DA is -59.3 mV pH $^{-1}$ (E^o (V) = -0.059 pH + 0.57, R^2 = 0.99) and UA is -60.7 mV pH $^{-1}$ (E^o (V) = -0.06 pH + 0.72, R^2 = 0.99).

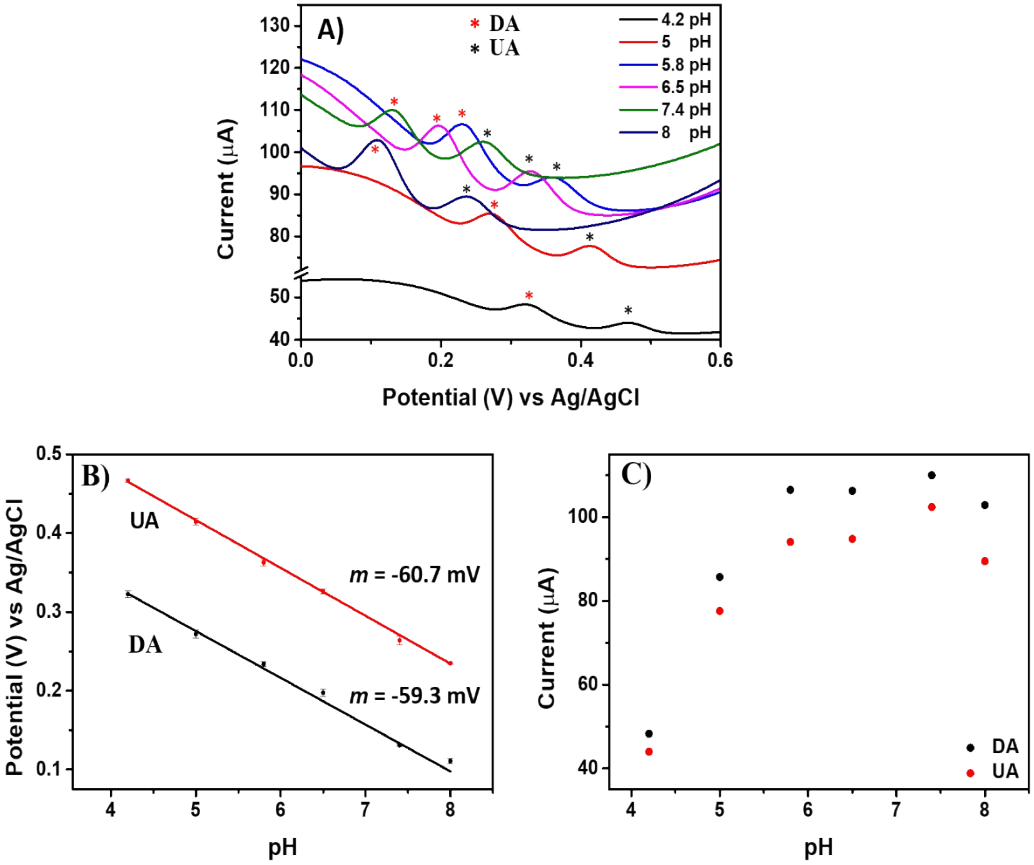

Fig. S3. (A) DPVs recorded for a mixture of 0.1 mM DA and 0.15 mM UA at different pH values from 4.2 to 8 at CNQDs/*f*-CNT/GCE, (B) calibration plots of DA and UA for E^0 *vs* pH for CNQDs/*f*-CNT/GCE, (C) plots of peak current of DA and UA *vs* pH for CNQDs/*f*-CNT/GCE.

4. The kinetics of electrode reaction -The influence of scan rate on anodic peak current

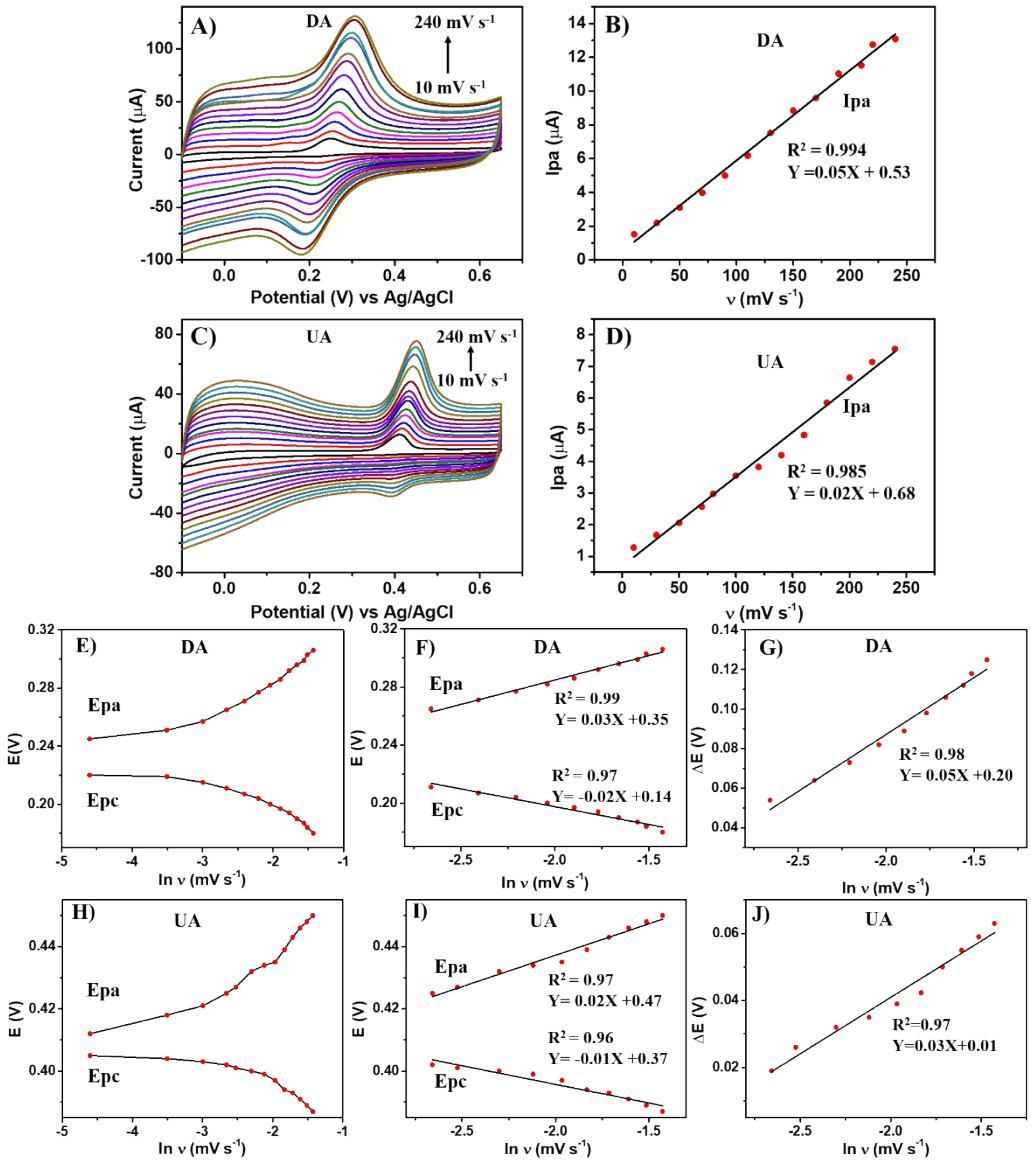

Fig S4. CVs of 200 μM DA (A), 200 μM UA (C) at CNQDs/*f*-CNT/GCE with different scan rates (10-240 mV s^{-1}) in 0.1 M PBS (pH -7.4); linear plot of anodic peak current of DA vs. scan rate (B) and linear plot of anodic peak current of UA vs. scan rate (D); variations of Ep vs. ln ν (E) and magnified image of the same plot for high scan rates (F) for DA; variations of ΔEp vs. In ν (G) for DA; variations of Ep vs. ln ν (H) and magnified image of the same plot for high scan rates (I) for UA; variations of ΔEp vs. In ν (J) for UA.

5. Interference study – Selectivity of CNQDs/*f*-MWCNT/GCE

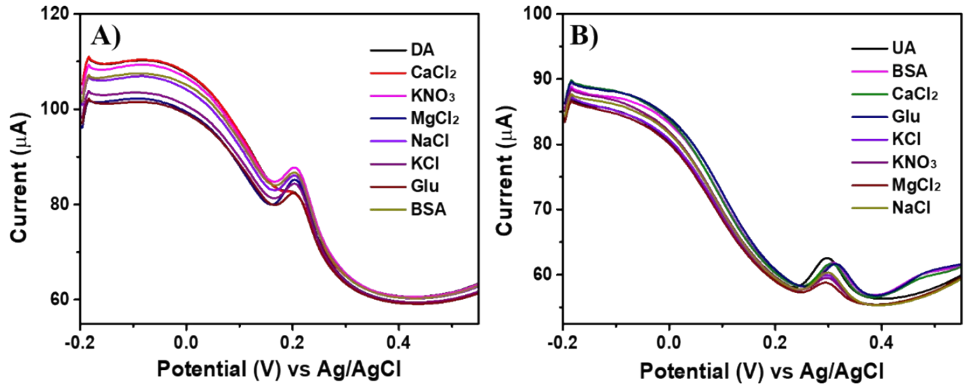

Fig. S5 Influence of 0.01 M interferents (glucose, bovine serum albumin, KCl, NaCl, $MgCl_2$, $CaCl_2$ and KNO_3) on 0.1 mM DA in 0.1 M PBS at 0.14 V *vs* Ag/AgCl (A) and 0.15 mM UA in 0.1 M PBS at 0.31 V *vs* Ag/AgCl (B).

6. Stability of the CNQDs/*f*-MWCNT/GCE sensor: Current response at 244 mV obtained by 0.1 mM DA in DPV over a period of 1 month.

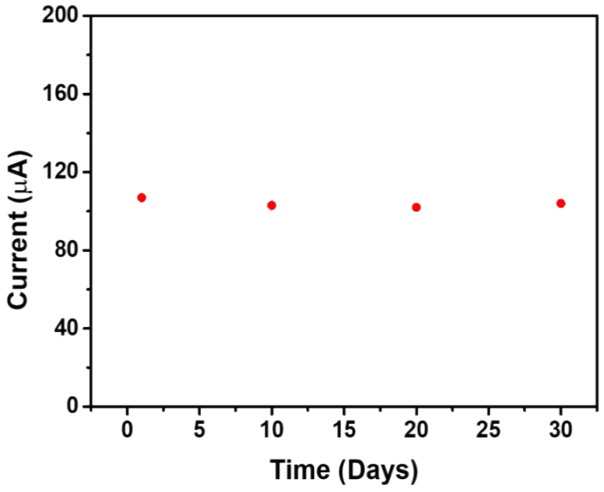

Fig. S6. Current response of 0.1 mM DA monitored at 244 mV in DPV for 30 days.

7. Results obtained using the DPV method in the detection of dopamine (Table S1) and uric acid (Table S2) spiked into biological fluid, human serum.

DPV of different concentrations of DA at CNQDs/*f*-CNT/GCE containing 0.1 mL of human serum in 0.1 M PBS

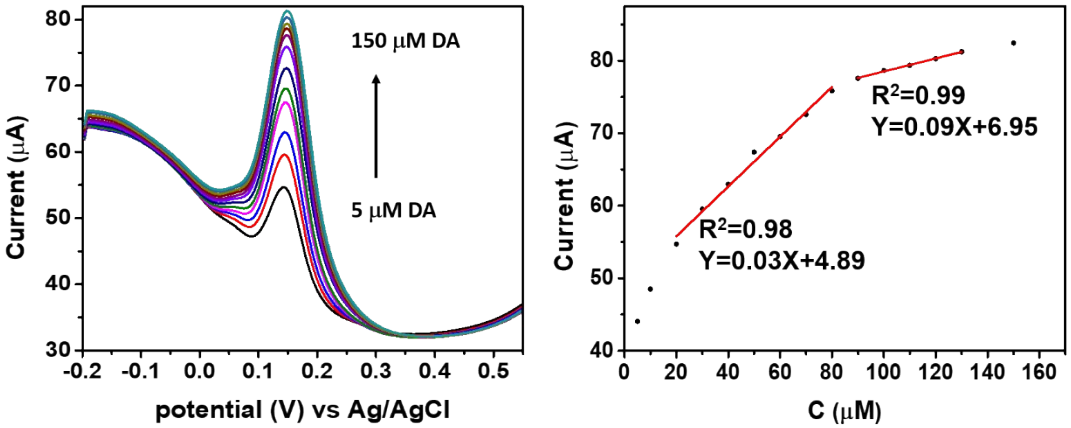

Fig. S7. (A) DPV response of different concentration of DA (5 - 150 μM) at CNQDs/*f*-CNT/GCE containing 0.1 mL of human serum in 0.1 M PBS. (B) the calibration plot of current *vs* concentration of DA.

Table S1. Determination of DA in human blood serum sample at CNQDs/*f*-CNT/GCE.

No	Added (μM)	Found (μM)	Recovery (%)
Serum 1	40	40.9	102.25
Serum 2	70	69.00	98.5
Serum 3	80	78.43	98.03
Serum 4	100	101.37	101.37
Serum 5	120	119.78	99.81

DPV of different concentrations of UA at CNQDs/*f*-CNT/GCE containing 0.1 mL of human serum in 0.1 M PBS.

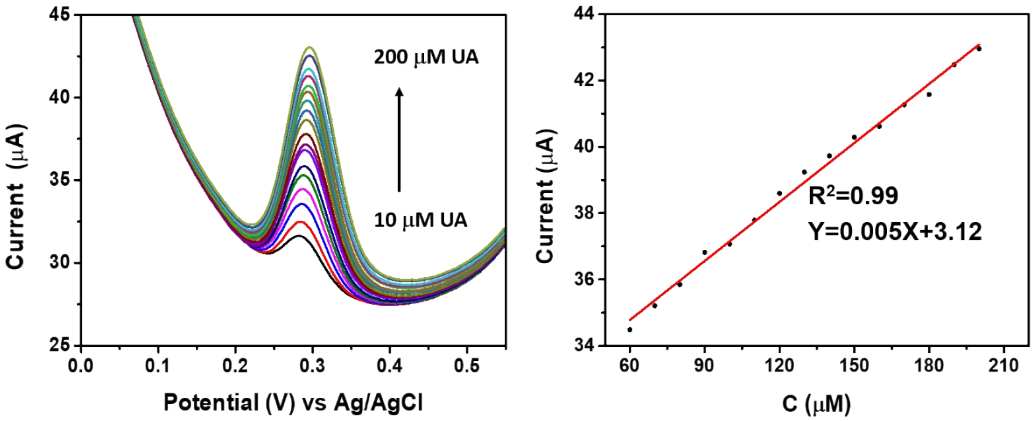

Fig. S8 (A) DPV response of different concentration of UA (10 - 200 μM) at CNQDs/*f*-CNT/GCE containing 0.1 mL of human serum in 0.1 M PBS. (B) the calibration plot of current vs concentration of UA.

Table S2. Determination of UA in human blood serum sample at CNQDs/*f*-CNT/GCE

No	Added (μM)	Recovered (μM)	Recovery (%)
Serum 1	80	78.09	97.612
Serum 2	100	98.67	98.67
Serum 3	120	124.46	103.71
Serum 4	150	152.91	101.94
Serum 5	200	197.89	98.945