Supplementary Information

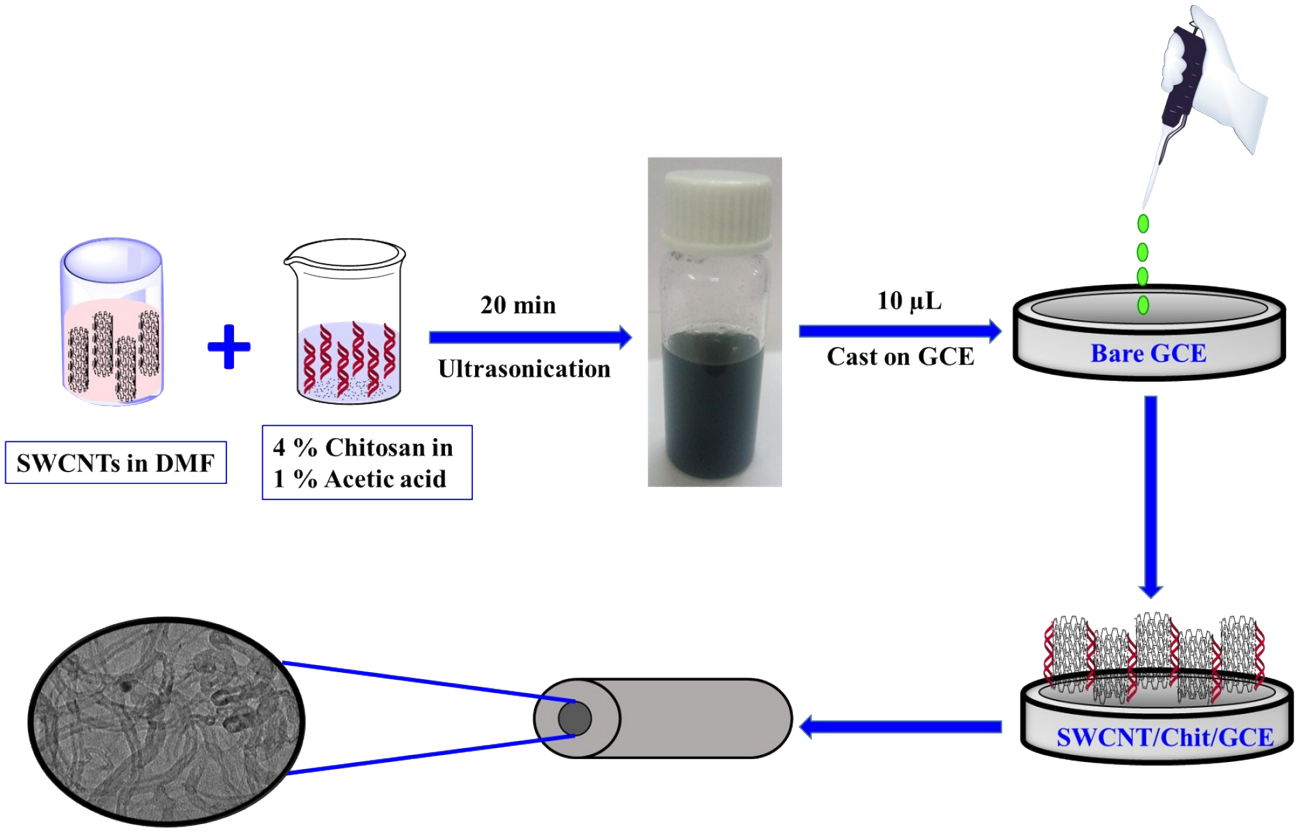
Selective recognition of atropine in biological fluids and leaves of *Datura stramonium* employing carbon nanotubes – chitosan film based biosensor

Suyash Mane, Rushda Narmawala and Sanghamitra Chatterjee*

Department of Chemistry, Institute of Chemical Technology, Matunga, Mumbai 400019, India

*Corresponding author. Tel.: +91-22-33611144

Email address: sk.chatterjee@ictmumbai.edu.in (S. Chatterjee)



Scheme S-1 Synthetic route of the developed biosensor.

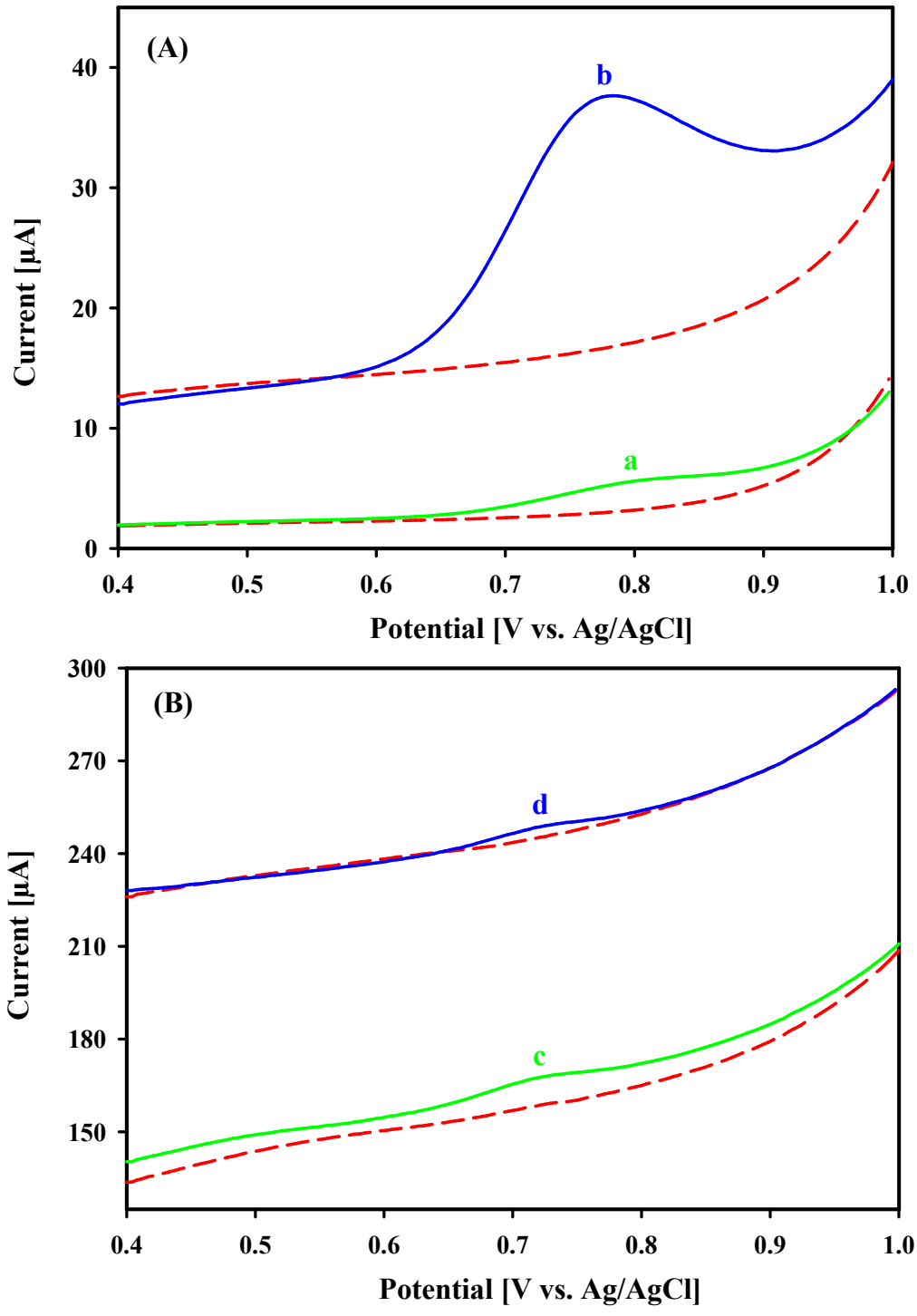


Fig. S-1 Voltammetric response obtained for 100 µM atropine in PBS of pH 10.0 with **(A)** (a) 0.25, (b) 0.5; **(B)** (c) 1.0 and (d) 2.0 mg mL^{-1} suspension of SWCNTs in 4% chitosan coated on GCE.

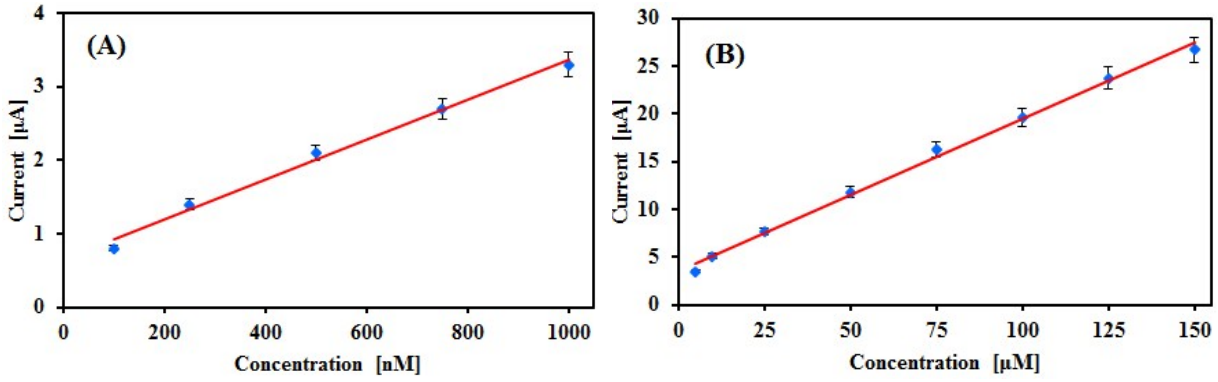


Fig. S-2 Linear calibration plot of atropine in the range **(A)** 100 to 1000 nM and **(B)** 5 to 150 µM observed at SWCNT/Chit/GCE.

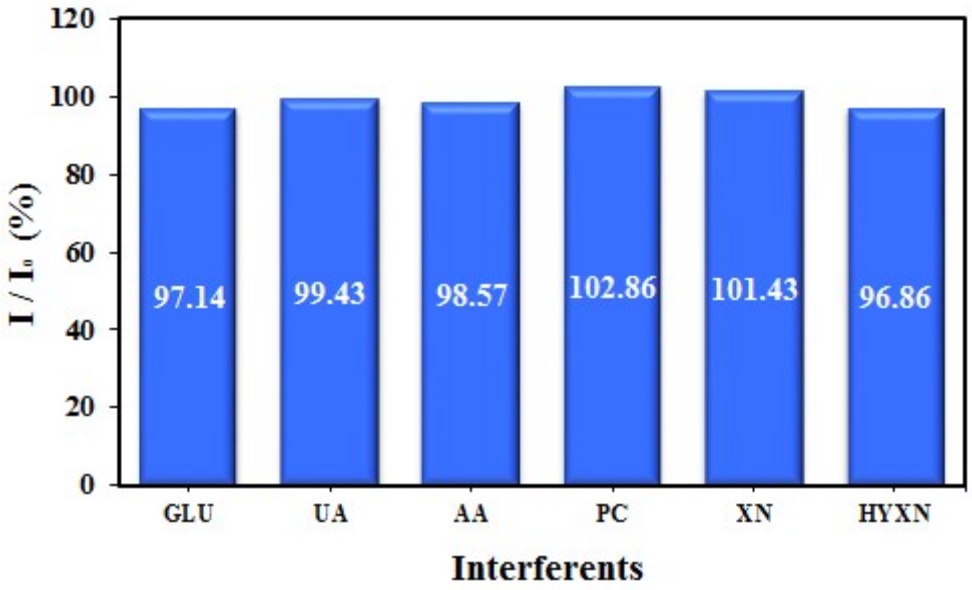


Fig. S-3 Effect of interferents of 500 μM each of glucose, uric acid, ascorbic acid, paracetamol, xanthine and hypoxanthine on 5 μM of atropine at SWCNT/Chit/GCE.

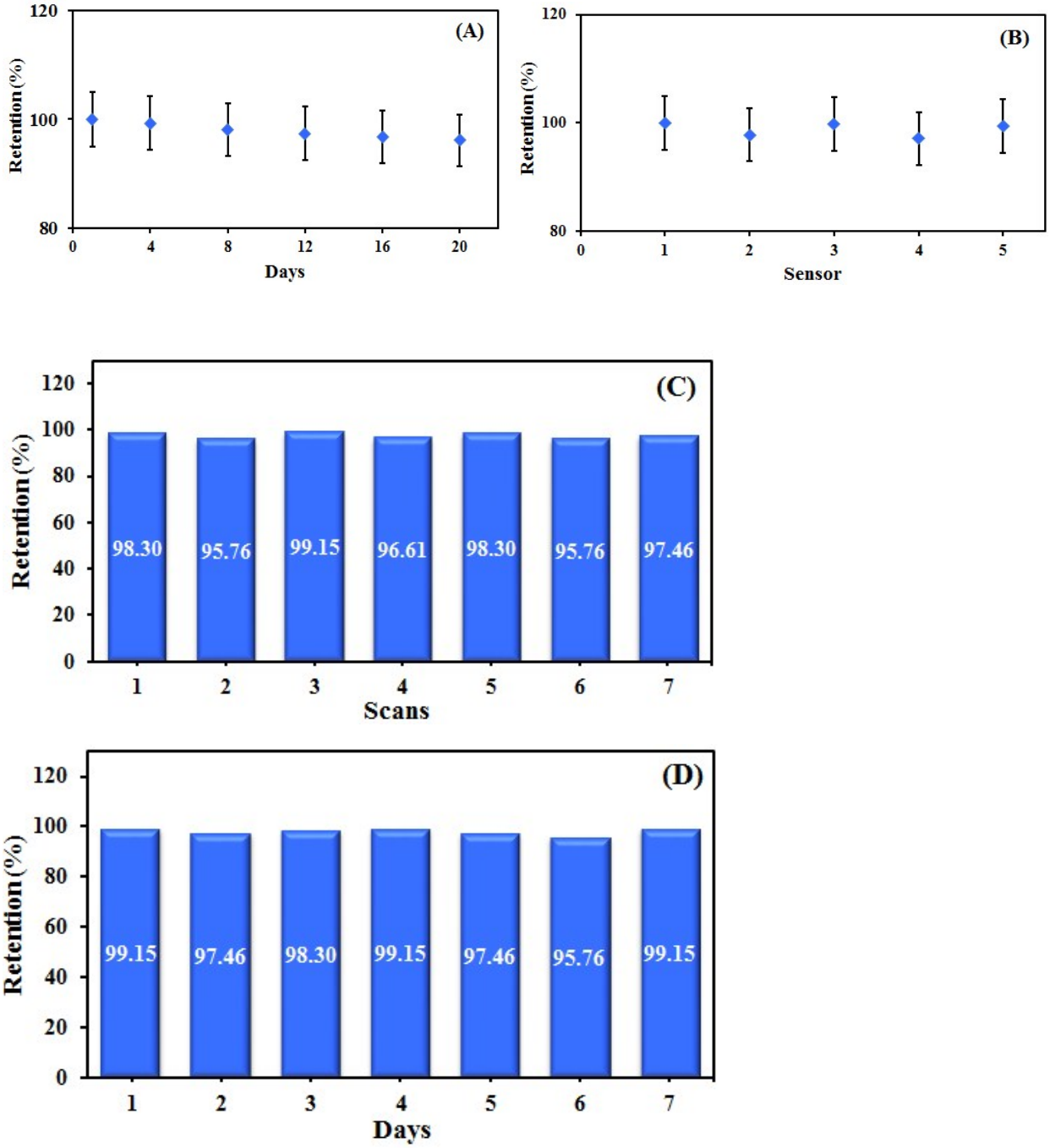


Fig. S-4 (A) Stability and **(B)** Sensor reproducibility of the SWCNT/Chit/GCE for 50 µM atropine in PBS of pH 10.0. **(C)** Intra day and **(D)** Inter day reproducibility of the SWCNT/Chit/GCE for 50 µM atropine in PBS of pH 10.0.

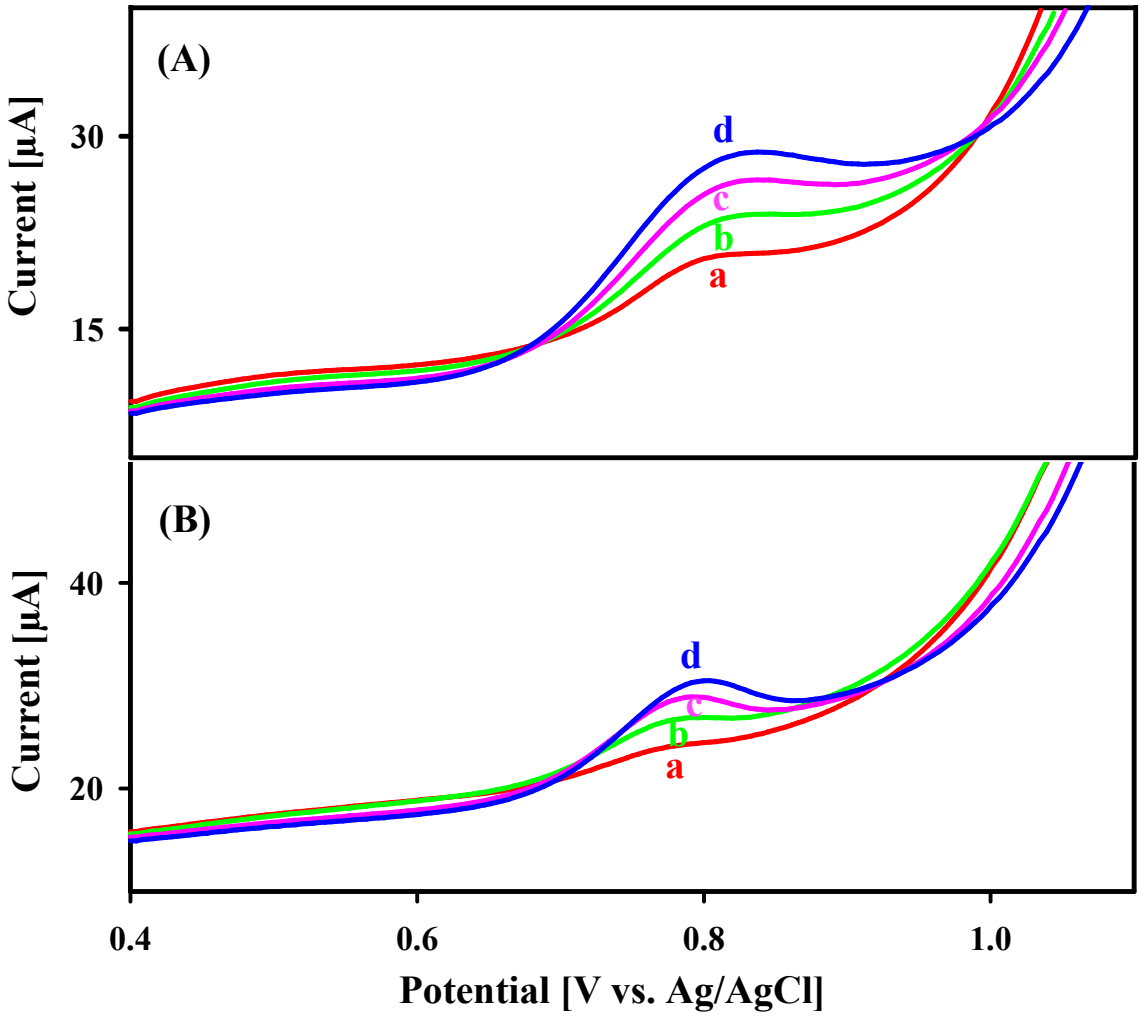


Fig. S-5 **(A)** Voltammetric response obtained at SWCNT/Chit/GCE for leaves of *Datura stramonium* sample 1 (a) before spiking and after (b) 15, (c) 30 and (d) 45 µM spiking of atropine.

(B) Voltammetric response obtained at SWCNT/Chit/GCE for pharmaceutical sample 1 (a) before spiking and after (b) 10, (c) 20 and (d) 30 µM spiking of atropine.

Table S-1 Concentration of atropine in human urine and human serum samples at SWCNT/Chit/GCE at pH 10.0.

	Spiked (µM)	Detected (µM)	Recovery (%)
Human Urine			
Sample 1	0.00	-----	-----
	20.00	19.63	98.15
	40.00	39.06	97.65
	60.00	59.12	98.53
Sample 2	0.00	-----	-----
	20.00	19.31	96.55
	40.00	40.75	101.88
	60.00	57.87	96.45
Human Serum			
Sample 1	0.00	-----	-----
	30.00	30.60	102.00
	60.00	58.81	98.02
	90.00	87.02	96.69
Sample 2	0.00	-----	-----
	30.00	29.97	99.90
	60.00	60.56	100.93
	90.00	87.65	97.39

Table S-2 Comparison of the SWCNT/Chit/GCE with the reported sensors for the electrochemical determination of atropine.

Technique	Sensor Used	Analytical Range (M)	Limit of Detection (M)	Sensitivity (μA/μM)	Reference
DPV	Co_3O_4-reduced graphene oxide modified carbon paste electrode	0.1×10^{-6} – 3.2×10^{-6}	0.03×10^{-6}	2.59	28
LSV	Poly (3, 4-ethylene-dioxythiophene) film modified Pt electrode	0.1×10^{-6} – 100×10^{-6}	27×10^{-9}	-----	31
CV	Screen printed graphite electrode	5×10^{-6} – 50×10^{-6}	3.9×10^{-6}	0.01	13
DPV	Modified pencil graphite electrode	0.6×10^{-6} – 600×10^{-6}	30×10^{-9}	0.20	29
SWV	SWCNT/Chit/GCE	100×10^{-9}– 150×10^{-6}	16.5×10^{-9}	2.70	This work