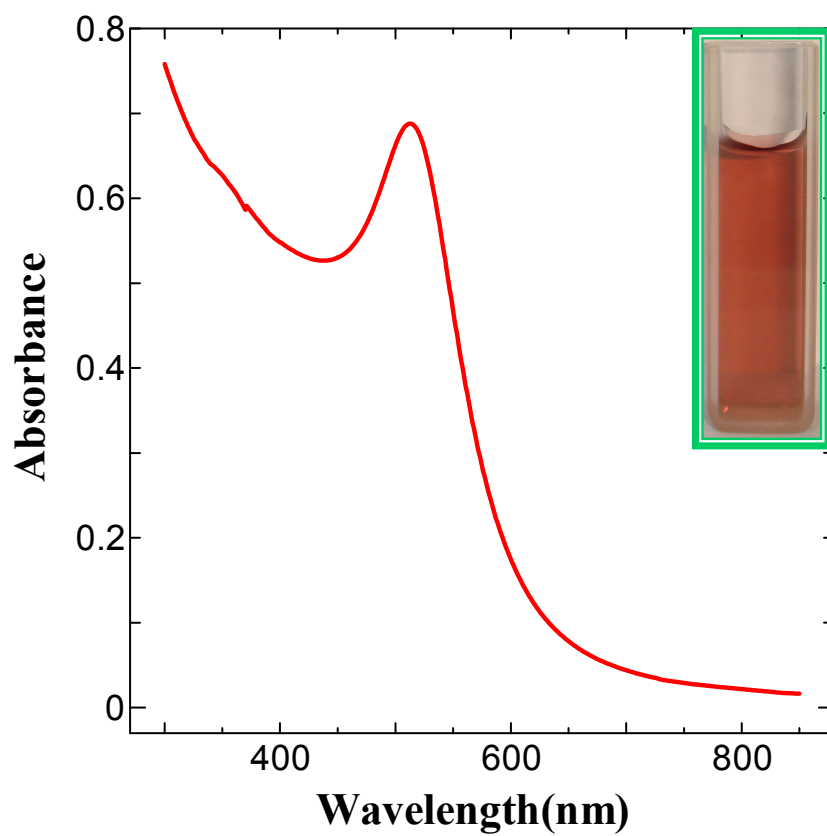


**Electronic supplementary information (ESI)**

**Fabrication, characterization and application of grafting based gold nanoparticles electrode for the selective determination of important neurotransmitter**

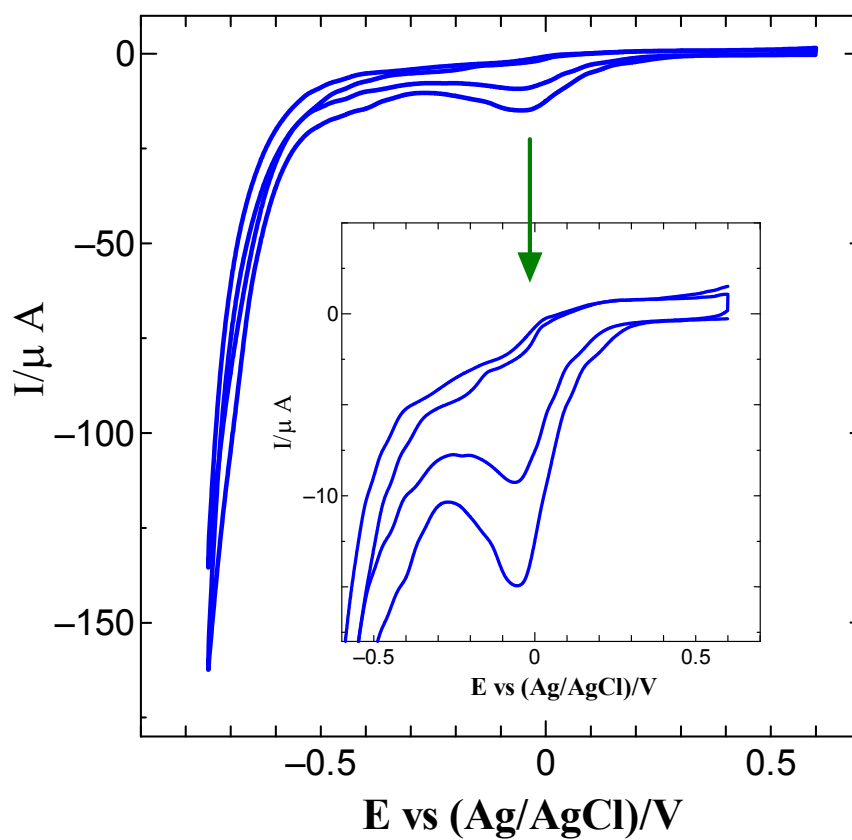
**Srinivasan Kesavan, S. Brilians Revin, S. Abraham John\***

*Centre for Nanoscience and Nanotechnology  
Department of Chemistry, Gandhigram Rural Institute  
Gandhigram - 624 302, Dindigul, Tamilnadu, India*



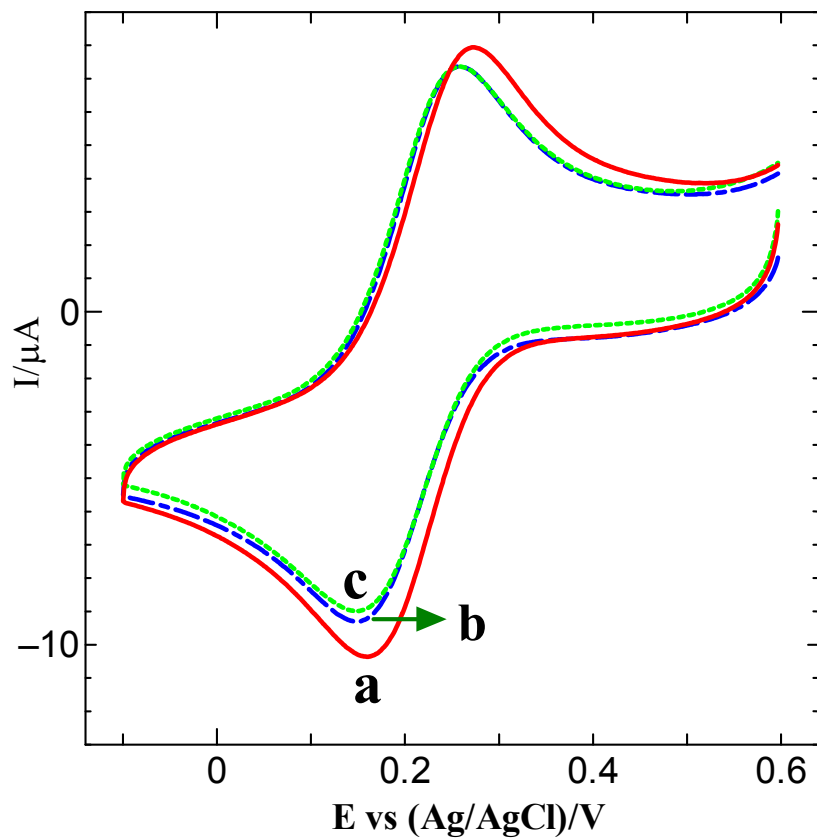
**Figure S1.** UV-visible spectrum of colloidal Glu-AuNPs. **Inset:** Photograph of Glu-AuNPs.

*S. Kesavan, S.B. Revin and S.A. John*



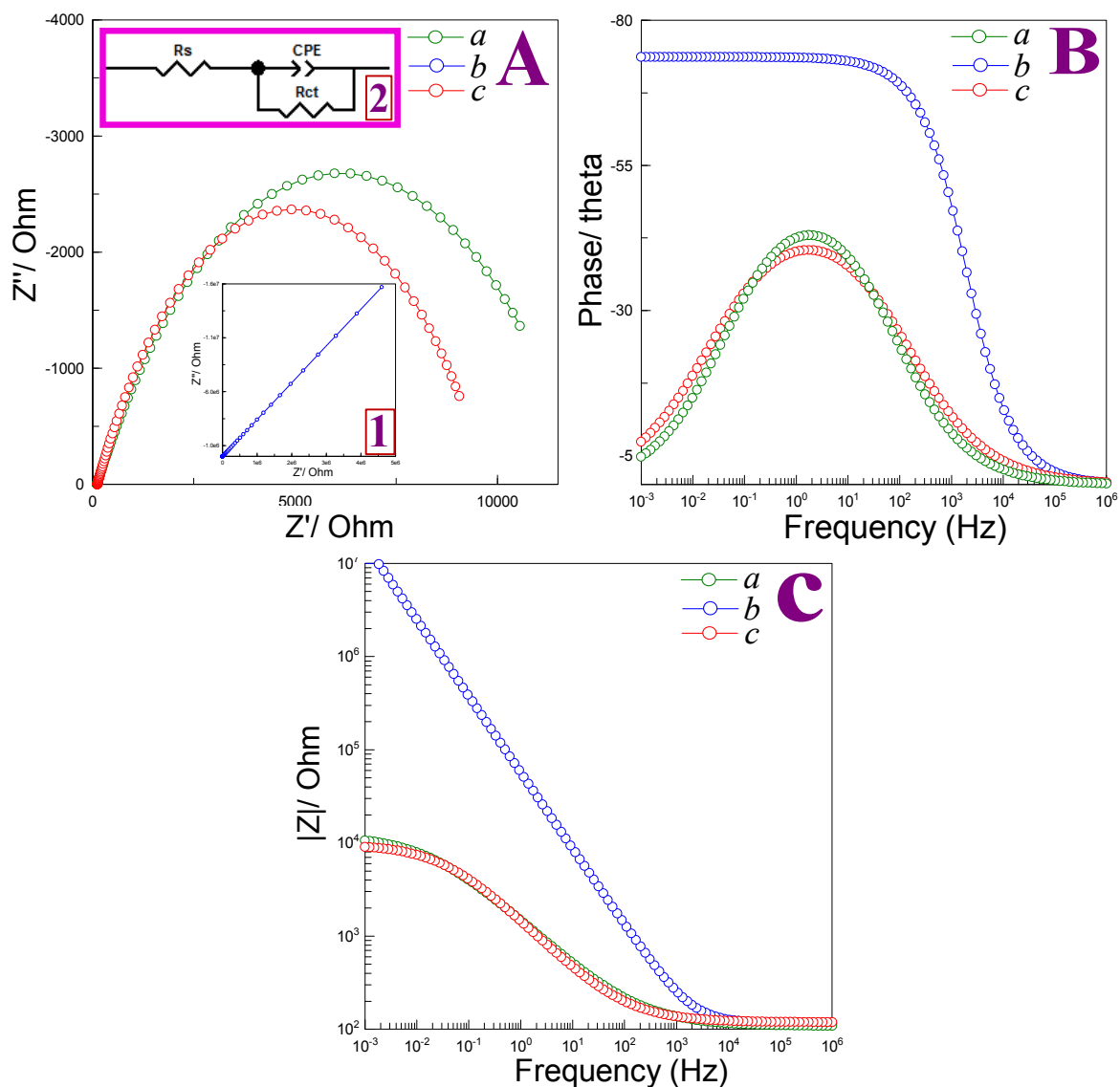
**Figure S2.** CVs for grafting of ITO electrode at a scan rate of  $20 \text{ mV s}^{-1}$  using 2 mM each DAB and  $\text{NaNO}_2$  in 0.5 M HCl.

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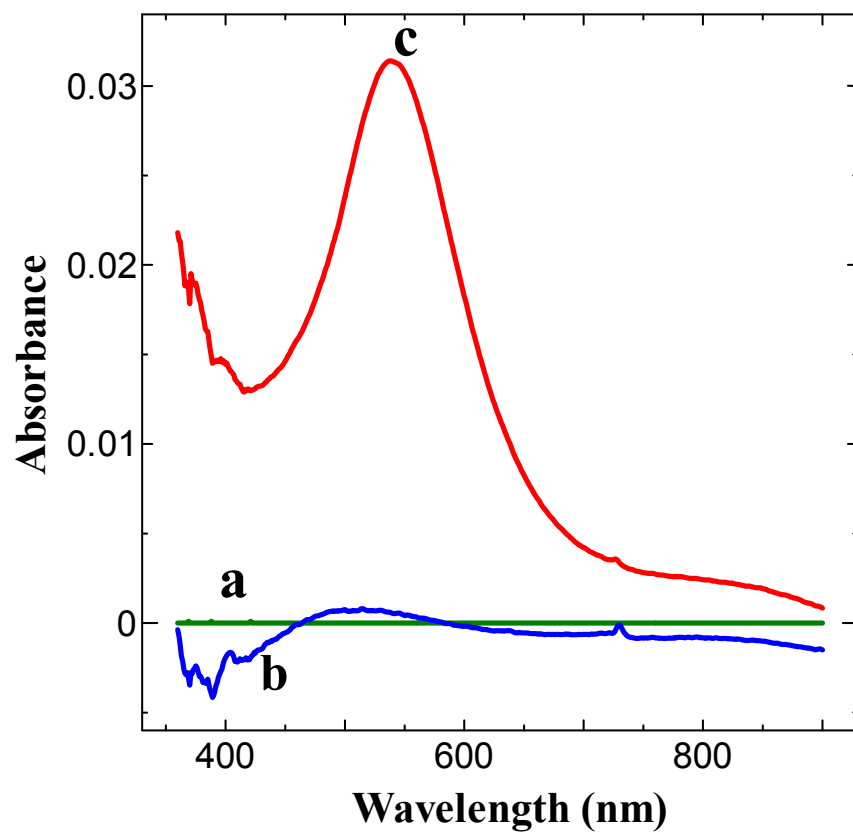
**Figure S3.** CVs obtained for 1 mM  $\text{K}_3[\text{Fe}(\text{CN})_6]$  containing 0.2 M PB solution (pH 7) for Glu-AuNPs grafted GC electrode immersed at (a) 3, (b) 6 and (c) 12 h in a colloidal solution of Glu-AuNPs at a scan rate of  $50 \text{ mV s}^{-1}$ .

*S. Kesavan, S.B. Revin and S.A. John*



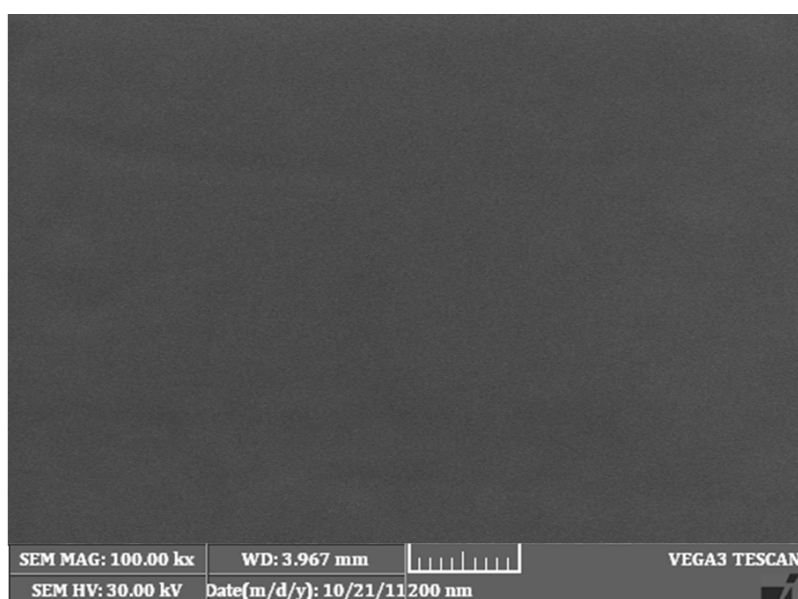
**Figure S4.** (A) Nyquist (B) Bode-phase angle and (C) Bode amplitude plots for (a) bare GC, (b) grafted GC and (c) Glu-AuNPs electrodes in 5 mM  $[\text{Ru}(\text{NH}_3)_6]\text{Cl}_3$  containing 0.2 M PB solution (pH 3) at scanning frequencies from 0.01 to 100000 Hz. **Insets (A):** (1) Bode-angle plot for grafted GC electrode and (2) Equivalent electrical circuit used for fitting the impedance spectra.

*S. Kesavan, S.B. Revin and S.A. John*



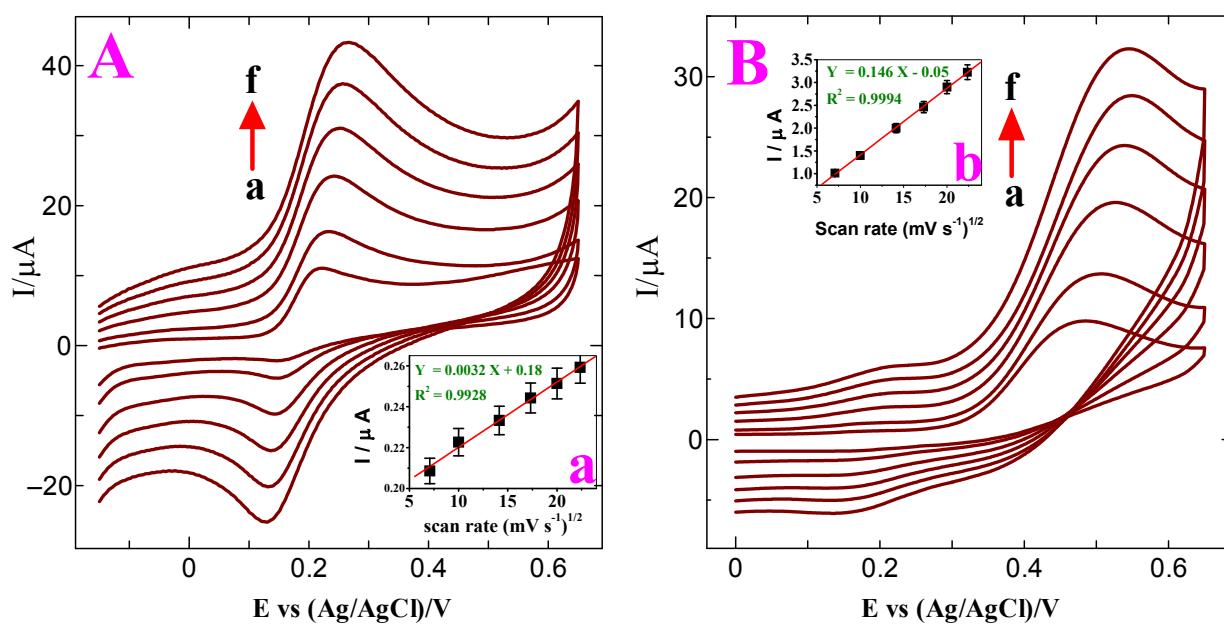
**Figure S5.** UV-visible spectra for (a) bare ITO, (b) grafted ITO and (c) Glu-AuNPs modified ITO substrates.

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**Figure S6.** SEM image obtained for Bare ITO substrate.

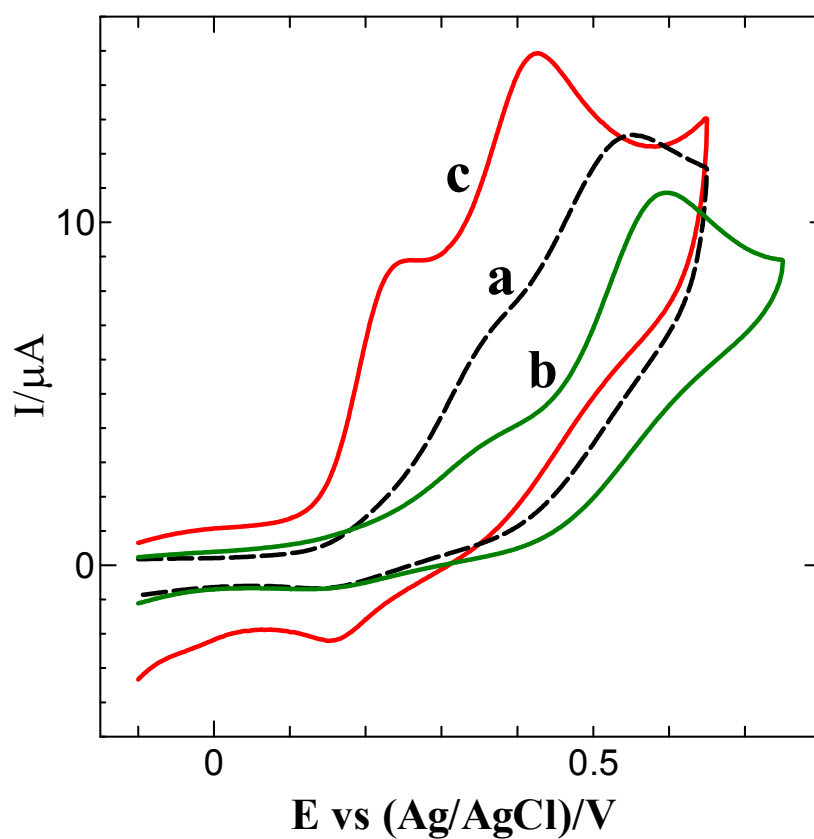
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**Figure S7.** CVs for 0.5 mM **(A)** NEP and **(B)** UA at scan rates of (a) 50, (b) 100, (c) 200, (d) 300, (e) 400 and (f) 500  $\text{mV s}^{-1}$  at Glu-AuNPs electrode in 0.2 M PB solution (pH 7.2). **Insets (a) and (b):** Plot of the anodic peak current vs. square root of scan rate.

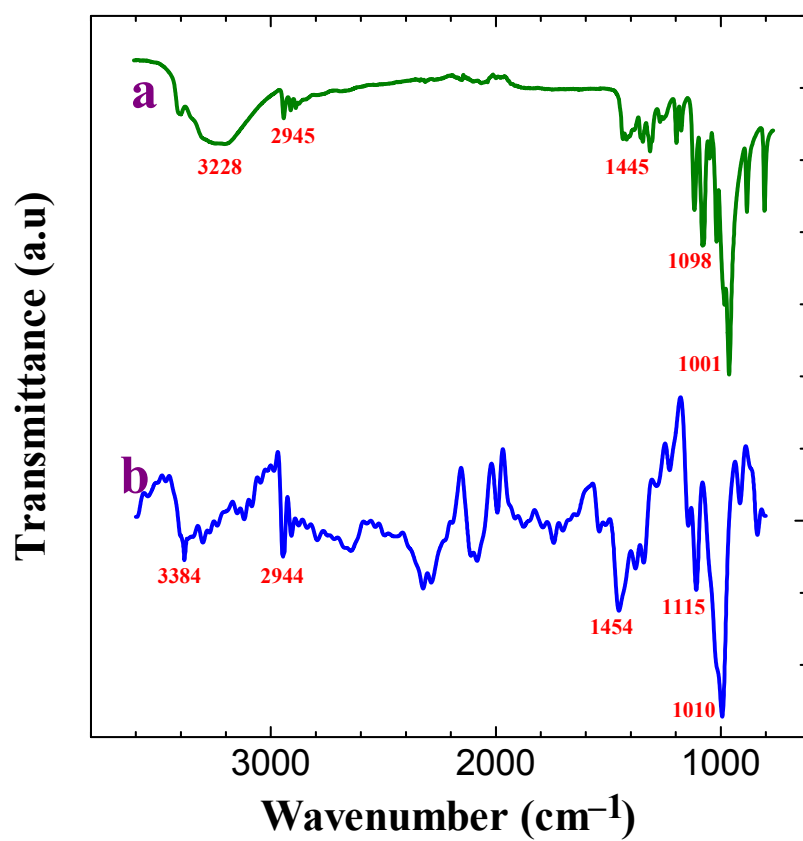
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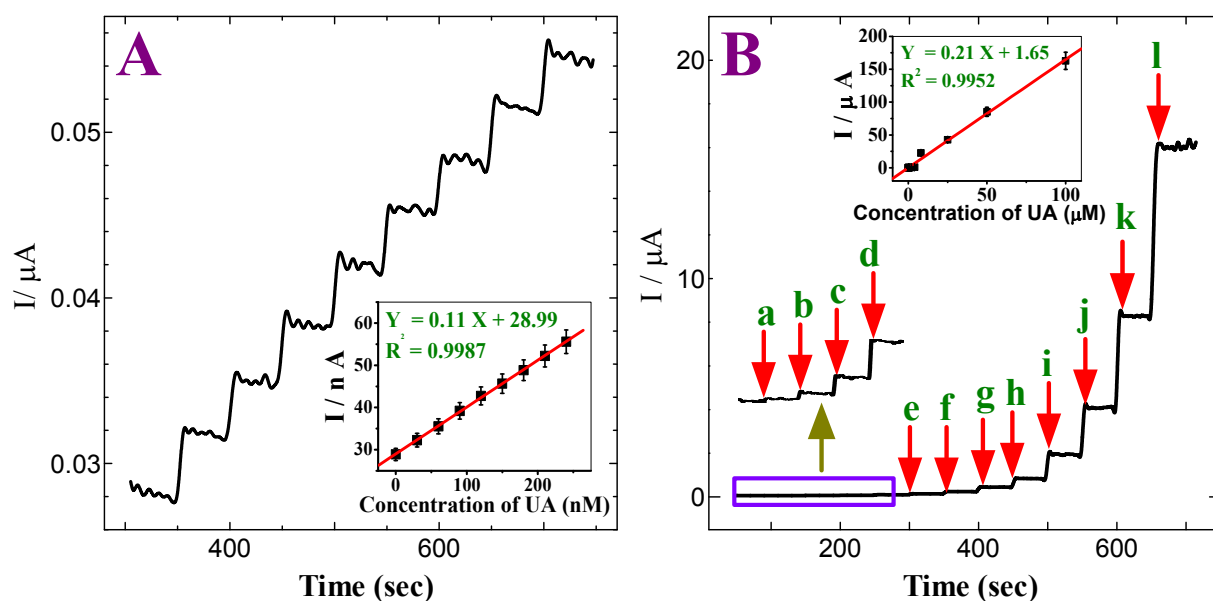


**Figure S8.** CVs obtained for a mixture of 0.5 mM NEP and UA at (a) bare GC, (b) grafted GC and (c) Glu-AuNPs electrodes in 0.2 M PB solution at a scan rate of  $50 \text{ mV s}^{-1}$ .

*S. Kesavan, S.B. Revin and S.A. John*



**Figure S9.** (a) FT-IR spectrum obtained for  $\beta$ -D-glucose and (b) ATR spectrum obtained for Glu-AuNPs ITO substrate.



**Figure S10. (A)** Amperometric *i-t* curve for the determination of UA at Glu-AuNPs electrode in 0.2 M PB solution (pH 7.2). Each addition increases the concentration of 30 nM of UA at regular interval of 50 s.  $E_{app} = +0.65$  V. **Inset (a):** Plot of concentration of UA vs. current. **(B)** Amperometric *i-t* curve for the determination of UA at Glu-AuNPs electrode in 0.2 M PB solution (pH 7.2). Each addition increases the concentrations of (a) 0.03 (b) 0.1 (c) 0.2 (d) 0.4 (e) 0.8 (f) 2 (g) 4 (h) 8 (i) 25 (j) 50 (k) 100  $\mu$ M and (l) 200  $\mu$ M UA at Glu-AuNPs electrode in 0.2 M PB solution (pH 7.2) at a regular interval of 50 s.  $E_{app} = +0.65$  V. **Inset (b):** Plot of concentration of UA vs. current.

S. Kesavan, S.B. Revin and S.A. John

**Table S1**

Table for impedance data

parameter	Bare GC	Grafted electrode	Glu-AuNPs electrode
$R_s$ (k $\Omega$ )	0.107	0.115	0.119
CPE (C)	$2.499 \times 10^{-4}$	$3.866 \times 10^{-6}$	$2.273 \times 10^{-4}$
$R_{ct}$ (k $\Omega$ )	13.34	4500	10.05
$K_{et}$ (cm s $^{-1}$ )	$5.64 \times 10^{-4}$	$1.67 \times 10^{-6}$	$7.49 \times 10^{-4}$

*S. Kesavan, S.B. Revin and S.A. John*