Supporting Information

An innovative electrochemical immuno-platform towards ultra-sensitive monitoring of 2-Arachidonoyl glycerol in rat samples with sleep deprivation: Bioanalysis of endogenous cannabinoids using biosensor technology

Fereshteh Kohansal [a,1], Ahmad Mobed [b,c,1], Rana Ansari [d], Mohammad Hasanzadeh [a,e,*], Ali. Ahmadalipour [f,**], Nasrin Shadjou [g]

[a] Pharmaceutical Analysis Research Center, Tabriz University of Medical Sciences, Iran.

[b] Aging Research Institute, Faculty of Medicine, Tabriz University of Medical Sciences, Iran

[c] Physical Medicine and Rehabilitation Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

[d] Drug Applied Research Center, Tabriz University of Medical Sciences, Iran.

[a] Nutrition Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

[f] Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Iran.

[g] Department of Nanochemistry, Nanotechnology Research Center, Faculty of Science and Chemistry, Urmia University, Urmia, Iran.

Corresponding author:
Pharmaceutical Analysis Research Center, Tabriz University of Medical Sciences, Tabriz 51664, Iran. hasanzadehm@tbzmed.ac.ir
Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Iran. ali.ahmadalipour1@gmail.com
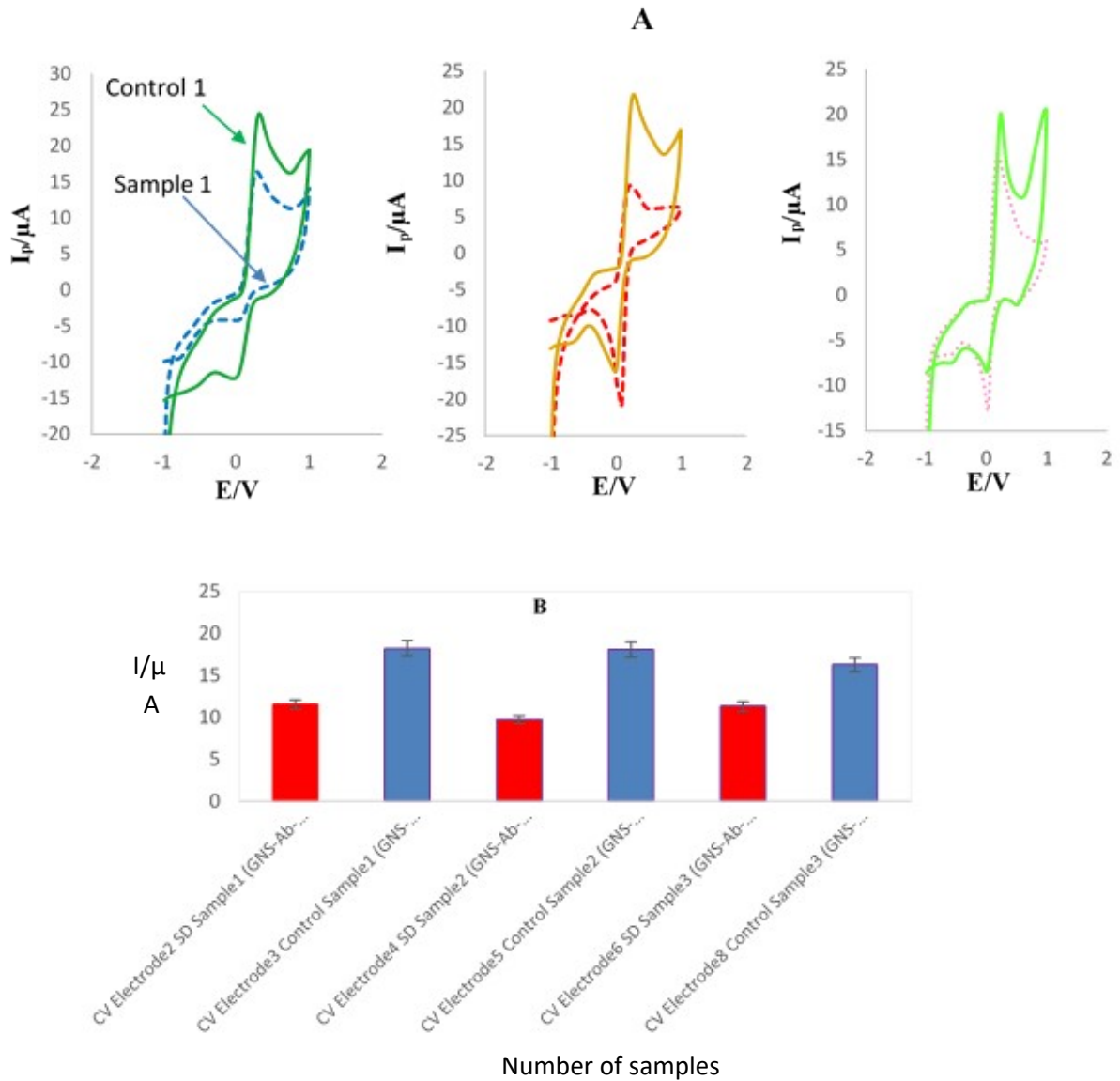
[1] Co-first author: Equal contribution.

Fig. S1. (A) CVs of engineered immunosensor in the presence of various serum samples of rate before and after depression process. Information; E_{begin}: -1.0 V, $E_{vertex1}$: 1.0 V, $E_{vertex2}$: -1.0 V, E_{step}: 0.01 V, scan rate: 0.1 V/s. **(B)** Histogram of peak current *versus* type of serum sample of rat (RSD= 2.42%, n=6).
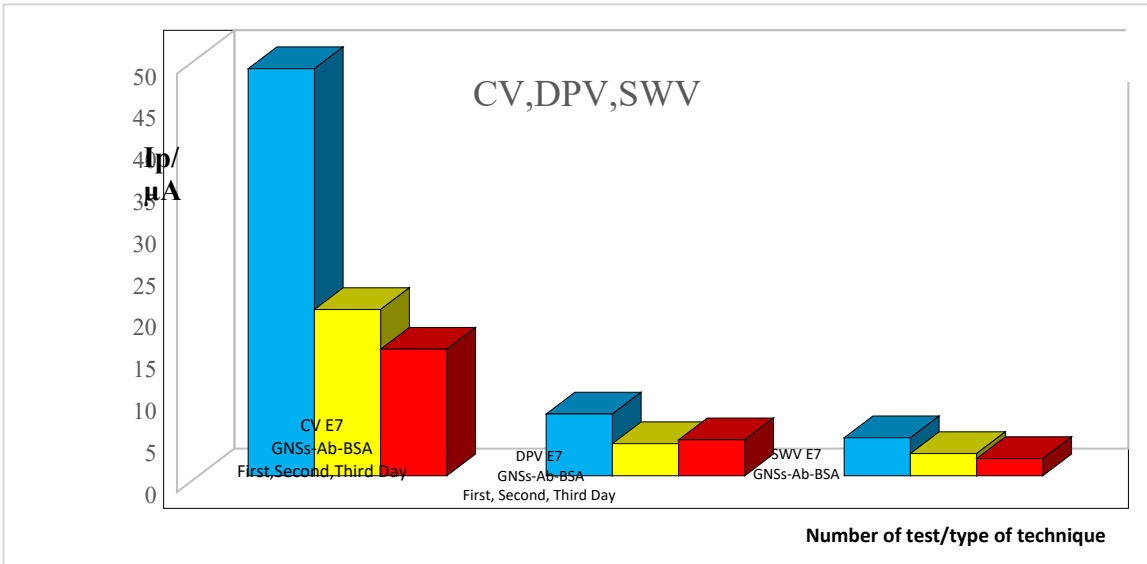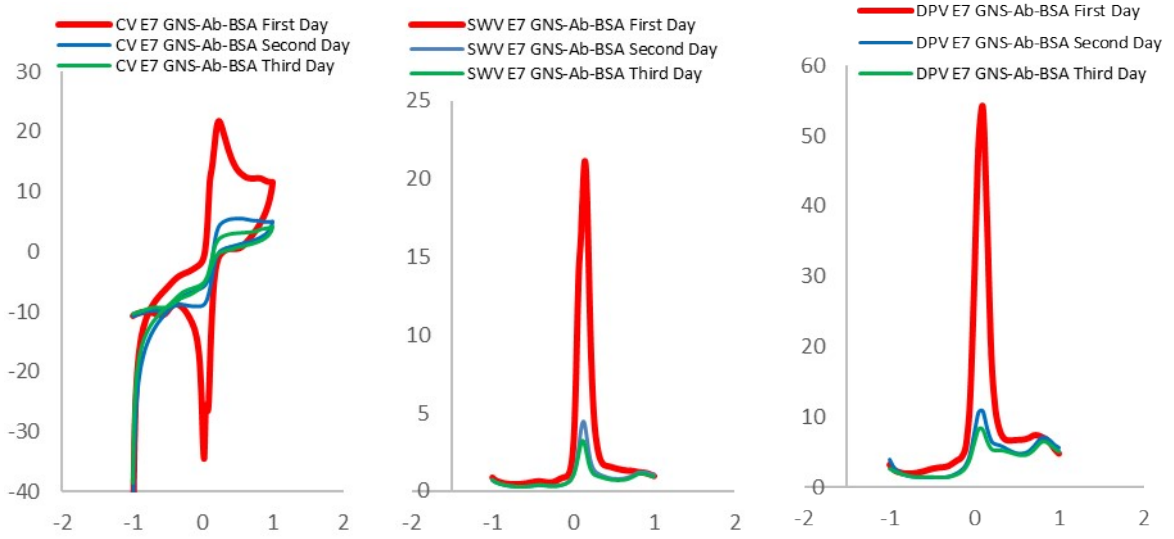
Fig. S2. Inter-day Stability of engineered immunosensor. Experimental condition is similar to Fig. 1.
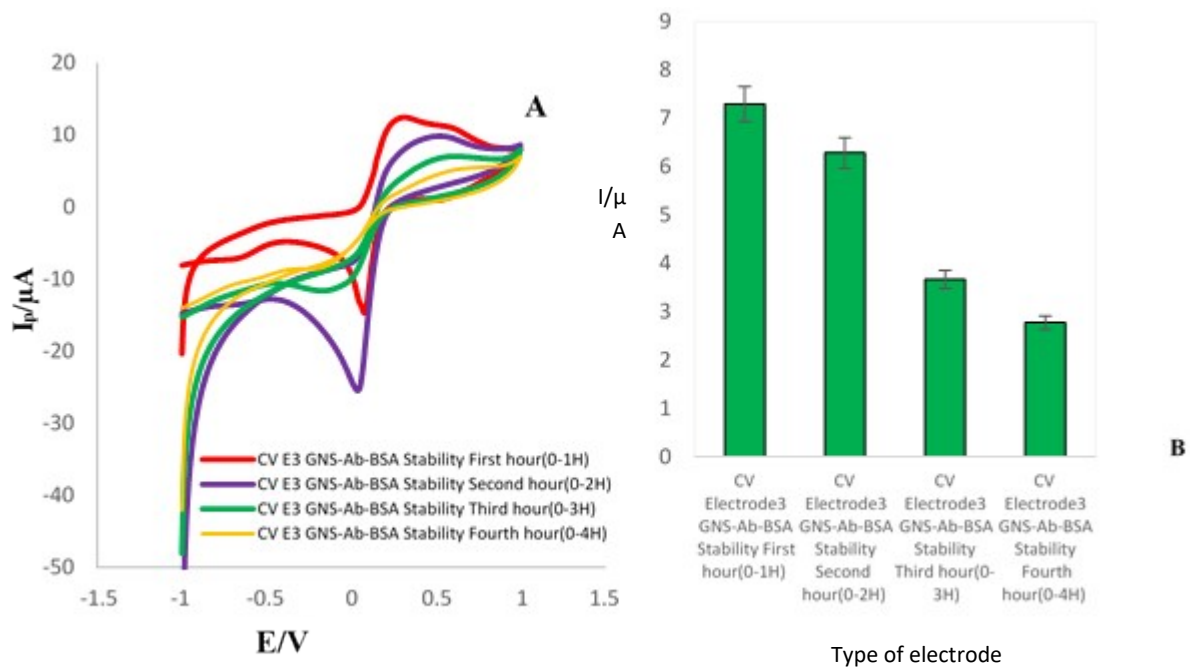
Fig. S3. A) CVs of engineered immunosensor in different time of storage (1, 2, 3, and 4 h). **(B)** Histogram of peak current versus time of incubation (RSD= 3.68%, n=3).
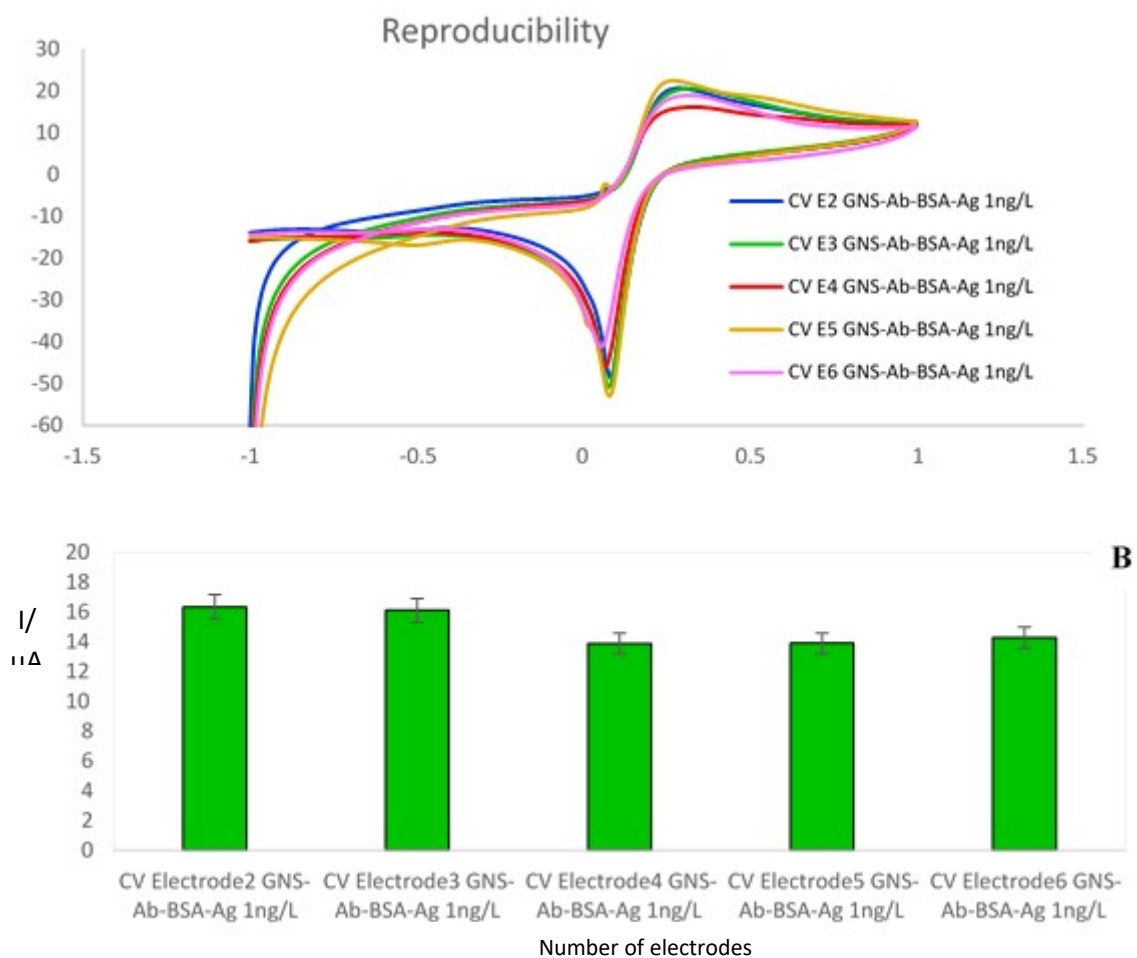
Fig. S4. Reproducibility of developed immunosensor, **(A)** CV of five electrode prepared in similar condition; E_{begin}: -1.0 V, $E_{vertex1}$: 1.0 V, $E_{vertex2}$: -1.0 V, E_{step}: 0.01 V, scan rate: 0.1 V/s, in the $K_4Fe (CN)_6$ /$K_3Fe (CN)_6$ solution, (B) Dependency of peak current *versus* type of electrode (RSD= 0.73%, n=5).
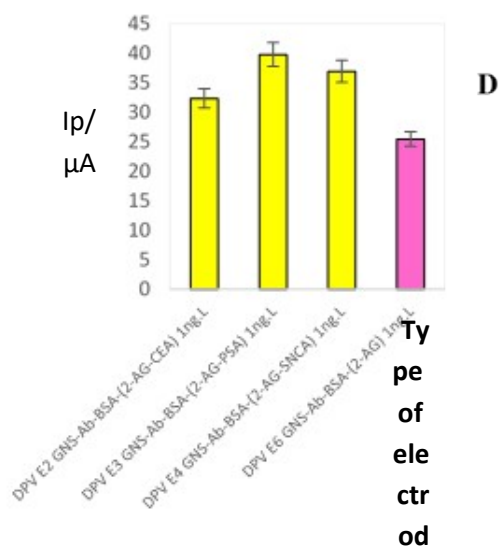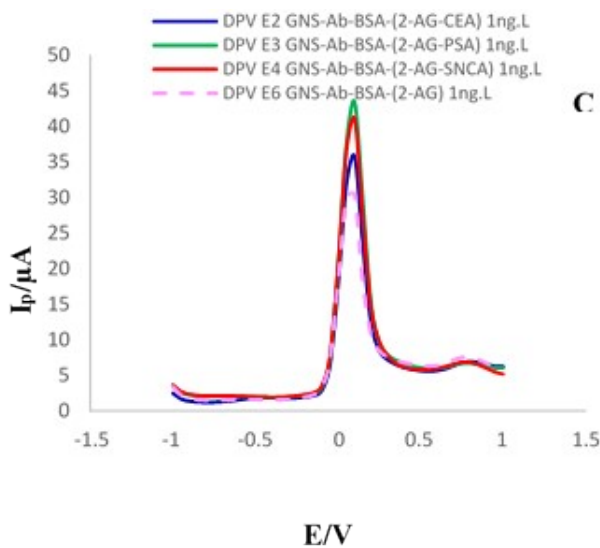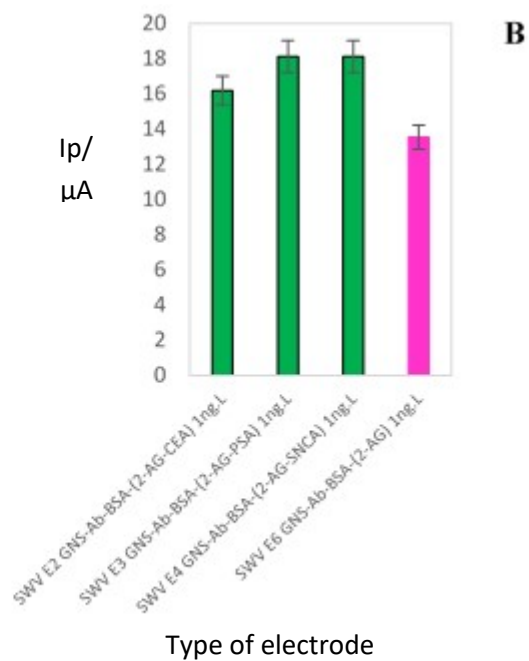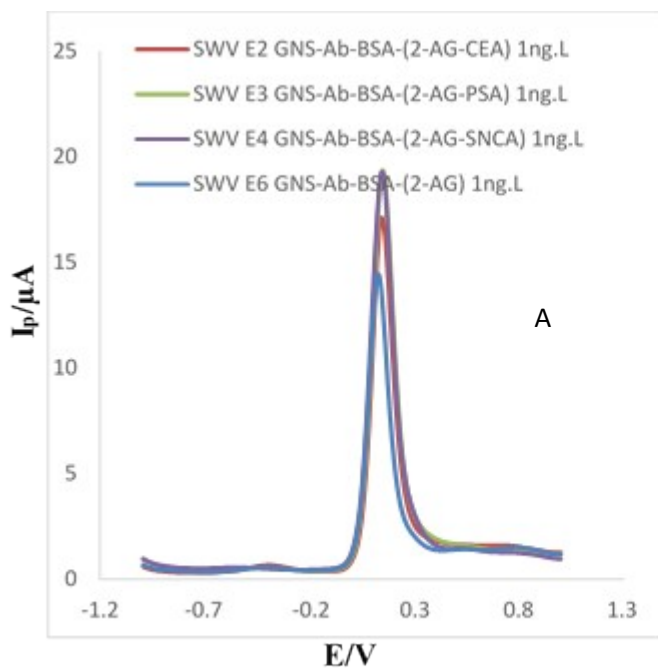
Fig. S5. Selectivity study of designed immunosensor in the presence of three interfere agent (PSA, CEA, SNCA). Experimental conditions are similar to legend of Fig.1. SWV (A), DPV (C), and (B&D) Histogram of peak current *versus* type of interfere species. (RSD=1.95%, n=3).