Supplementary information

Development of an Unmodified Screen-Printed Graphene Electrode for Nonenzymatic Histamine Detection

Prangthip Nakthong [a], Takeshi Kondo [b], Orawon Chailapakula [c], and Weena Siangproh [a*]

[a] *Electroanalytical and Imaging Sensor Research Group (EISRG), Department of Chemistry, Faculty of Science, Srinakharinwirot University, Sukhumvit 23, Wattana, Bangkok 10110, Thailand*

[b] *Department of Pure and Applied Chemistry, Faculty of Science and Technology, Tokyo University of Science, 2641 Yamazaki, Noda, Chiba, 278-8510, Japan*

[c] *Electrochemistry and Optical Spectroscopy Research Unit (EOSRU), Department of Chemistry, Faculty of Science, Chulalongkorn University, 254 Phayathai Road, Patumwan, Bangkok 10330, Thailand*

*Corresponding author: Tel: +662 640 5000 ext.18208; Fax: +662 259 2097

E-mail address: weena@g.swu.ac.th, weenasi@hotmail.com

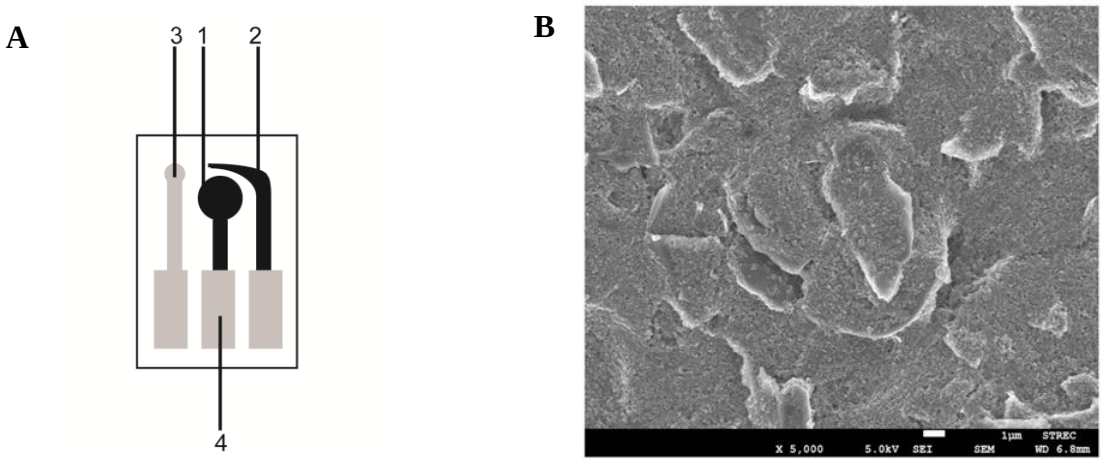

Fig. S1. (A) Screen-printed graphene electrode (SPGE). Graphene ink was printed to obtain the working electrode (1) and auxiliary (2), respectively. Ag/AgCl ink was printed to obtain the reference electrode (3) and conducting pads or electric contacts (4). (B) SEM images of surface morphology of graphene screen-printed electrodes.

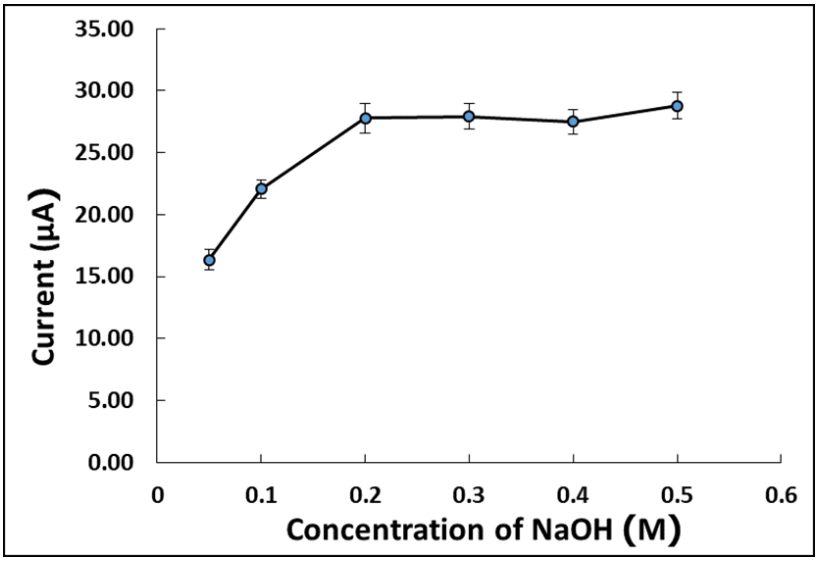

Fig. S2. The effect of NaOH concentration

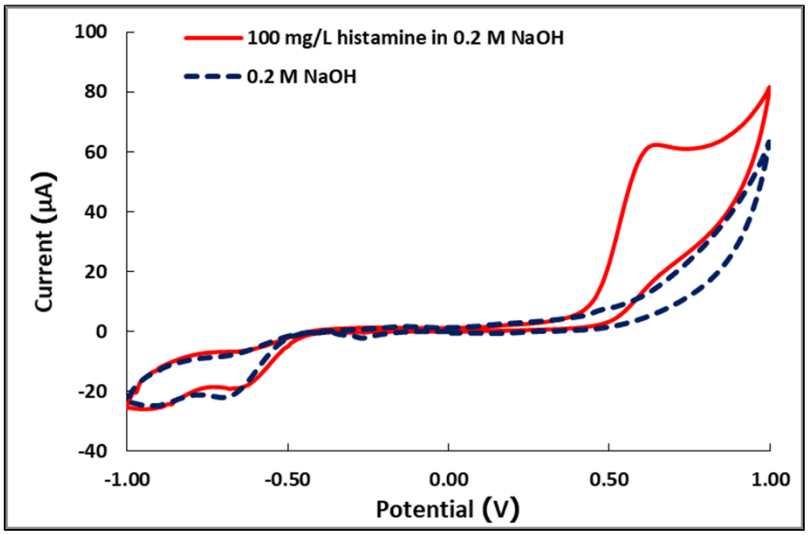

Fig. S3. Cyclic voltammograms obtained from unmodified SPGE in 0.2 M NaOH (blue line) and 100 mg/L histamine in 0.2 M NaOH (red line), respectively.

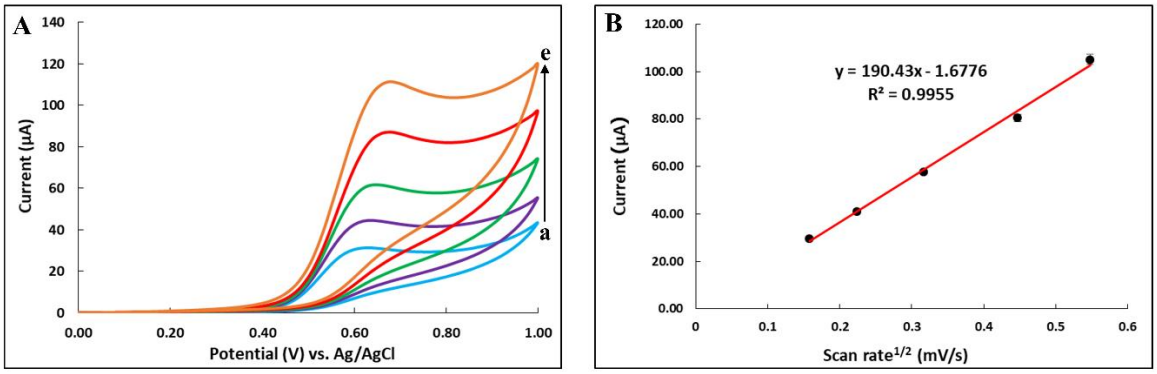

Fig. S4. (A) Cyclic voltammograms of histamine at unmodified SPGE in 0.2 M NaOH using different scan rates (a-e: 25, 50, 100, 200, and 300 mV/s, respectively), (B) Plot of the anodic peak currents *versus* the square root of the scan rate.

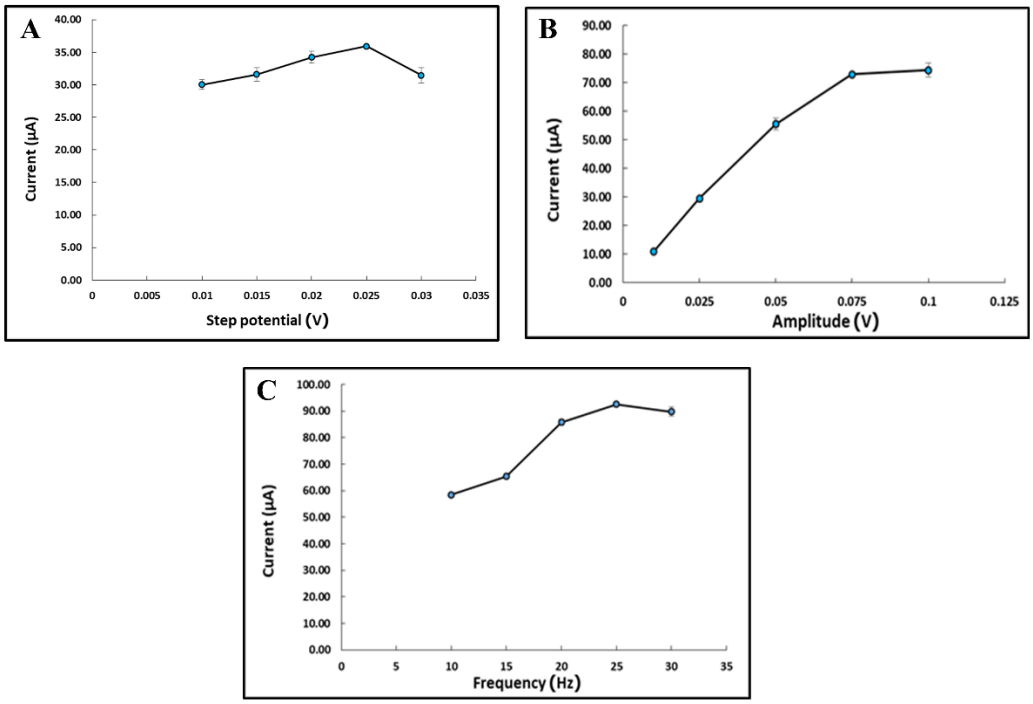

Fig. S5. Optimization of square wave voltammetric parameters for histamine detection using unmodified SPGE: (A) step potential, (B) amplitude, and (C) frequency