Supporting Information for:

Duplex Bioelectronic Tongue for Sensing Umami and Sweet Tastes Based on Human Taste Receptor Nanovesicles

Sae Ryun Ahn,[†,⊥] *Ji Hyun An,*[‡,⊥] *Hyun Seok Song,*[#] *Jin Wook Park,*[‡] *Sang Hun Lee,*[§] *Jae Hyun Kim,*[△]

Jyongsik Jang,[‡,*] *Tai Hyun Park* [†,□,*]

[†]School of Chemical and Biological Engineering, Bio-MAX Institute, Seoul National University, Seoul, 151-744, Republic of Korea

[‡]School of Chemical and Biological Engineering, Seoul National University, Seoul 151-744, Republic of Korea

[#]Division of Bioconvergence Analysis, Korea Basic Science Institute (KBSI), Yuseong, Daejeon 169-148, Republic of Korea

[§]Department of Bioengineering, University of California Berkeley, CA 94720, USA

[△]S.LSI Material Technology Group, Device Solutions, Samsung Electronics 1, Samsung-ro, Giheung-gu, Yongin-si, Gyeonggi-do 446-711 Korea

[□]Advanced Institutes of Convergence Technology, Suwon, Gyeonggi-do 443-270, Republic of Korea

[⊥] These authors contributed equally to this study.

Corresponding Author:

[†]Tel: +82-2-880-8020; Fax: +82-2-875-9348

*E-mail: thpark@snu.ac.kr and jsjang@plaza.snu.ac.kr

Calcium signal analysis of monomeric receptor expressing-cells

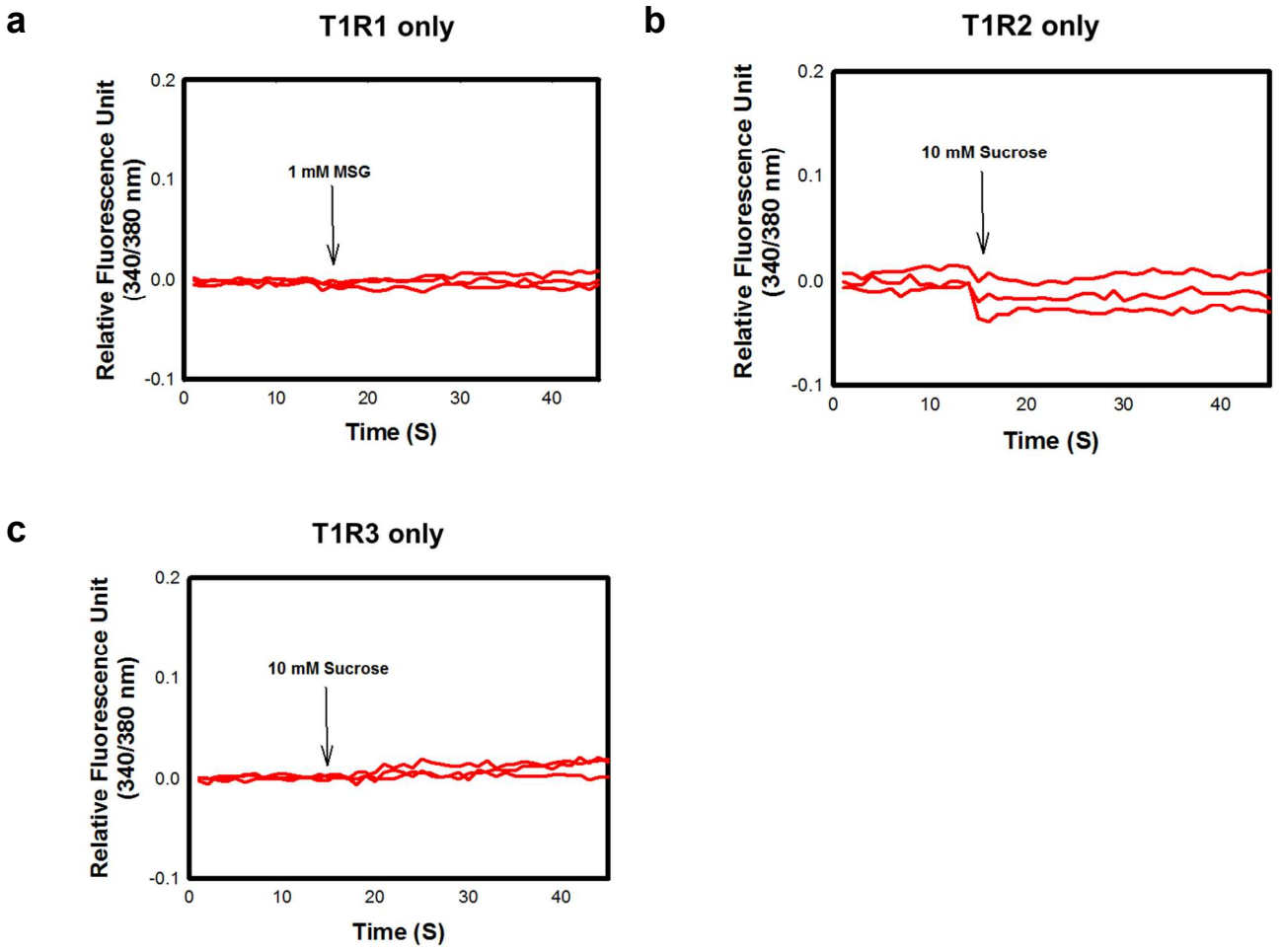

Figure S1. Ca^{2+} signal analysis using monomeric taste receptor expressing cells. (a) T1R1 only expressing-cells upon the addition of 1 mM of MSG, (b) T1R2 only expressing-cells upon the addition of 10 mM of sucrose and (c) T1R3 only expressing-cells upon the addition of 10 mM of sucrose.

Figure S1 shows that heterodimeric GPCRs exhibit cellular signal transductions when they are formed as original heterodimeric structures.

Photograph of MGE circuit and HR-TEM image of single layer graphene.

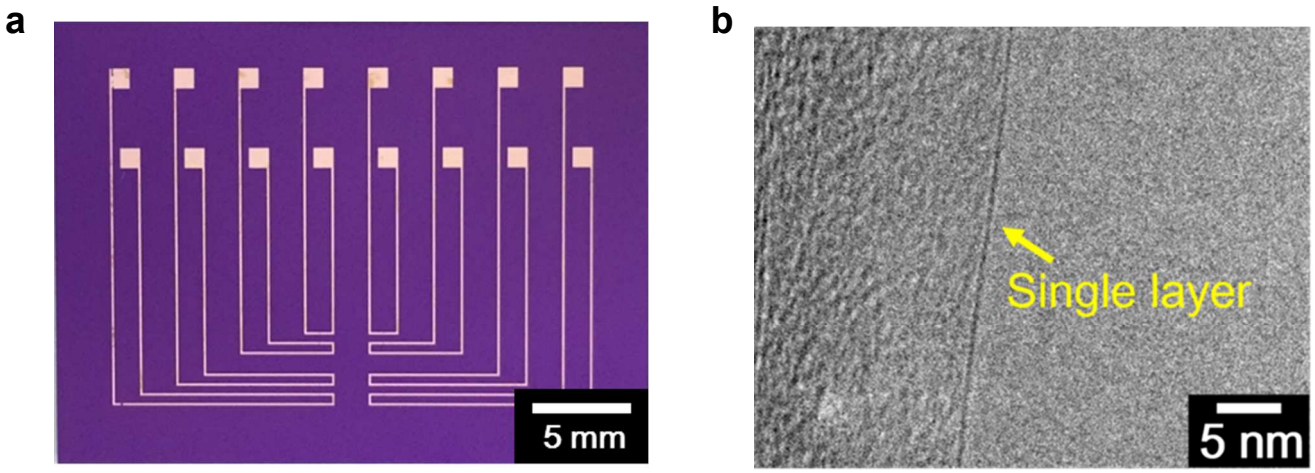

Figure S2. (a) Photographic image of a fabricated multiplexed graphene electrode. (b) HR-TEM observation of CVD-grown single layer graphene.

Figure S2 (a) displays the photograph of a MGE circuit on silicon oxide wafer. The MGE has eight pairs of source and drain electrodes. Our DBT device simultaneously use two pairs of the contact electrodes to detect multiple responses for umami and sweet tastants.

In order to clarify the number of graphene layers, an edge of the graphene was observed using HR-TEM that is a powerful tool to visualize the graphene layer. HR-TEM observation demonstrates the presence of single layer graphene as shown in Figure S2 (b).