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Detection of Nutrients Using Honeybee-Mimic Bioelectronic Tongue Systems

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Abstract : We report a floating electrode-based bioelectronic tongue mimicking honeybee taste systems for the detection and discrimination of various nutrients. Here, carbon nanotube field effect transistors with floating electrodes (CNT-FET) were hybridized with nanovesicles containing honeybee nutrient receptors, gustatory receptors of Apis mellifera. This strategy enables us to detect nutrient substance with a high sensitivity and selectivity. It could also be utilized for the detection of nutrients in liquid food. This floating electrode-based bioelectronic tongue mimicking insect taste systems can be a simple, but highly effective strategy in many different basic research areas about sensory systems. Moreover, our research provides opportunities to develop various applications such as food screening, and it also can provide valuable insights on insect taste systems.

Keywords : taste system, CNT-FET, insect gustatory receptor, biolelectronic tongue
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