

**Chemical modification of swCNT-FET with N-terminal domain of human sweet taste receptor for the development of protein-based sweet taste sensor**

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The development of taste sensors has been based on inorganic materials, which selectively detect specific chemical substances. However, these methods still have limitations in terms of selectivity and sensitivity. Moreover, these sensors cannot mimic human system because human taste system has broad selectivity for many tastants. To overcome these limitations, we applied biological human taste receptor to the development of artificial tongue. The human sweet taste receptors are heteromeric hTAS1R2:hTAS1R3. According to the recent study, hTAS1R2 mediates the taste of some sweeteners and further indicate that the important interaction determinants are located in the N-terminal extracellular domain. Here, we demonstrated the efficient chemical modification of single-walled carbon nanotube (swCNT)-field effect transistor (FET) with N-terminal domain of human sweet taste receptor, hTAS1R2, produced from *E. coli*. The N-terminal domain of human sweet taste receptor, hTAS1R2 was selectively immobilized on the swCNT region using chemical modification. This work provides a powerful tool for development of protein-based sweet taste sensor which mimics human taste system so that it could be useful in the food industry.