Synopsis of Original Research Paper

Establishment of perfume design method applying odor digitization by human olfactory receptor sensor

Kenji Tatematsu

Department of Biomolecular Science and Reaction, The Institute of Scientific and Industrial Research (ISIR), Osaka University

Smell sensory testing is very important in the development of a wide range of odor-related products such as cosmetics, foods, and air fresheners. However, the accuracy of the sensory test is limited to human ability, and both of reproducibility and throughput are low. In addition, it was difficult to share odor information across time and space. Since a perfumer needs to memorize many odors, the training period is at least 5 years, usually 10 years, which is very costly to grow. On the other hand, chemical odor sensors and gas chromatography are detection methods based on the structure of compounds, and it is impossible to directly link these measurement data with the sensory test results. Our group created an olfactory receptor sensor using cultured cells expressing all 388 subtypes of human olfactory receptors, and which was able to quantify all the odors that humans can perceive. In this study, the odor of commercially available perfume was measured and quantified by the olfactory receptor, and the odor of perfume was quantified. In the future, this technology will be able to transform fragrance blending that relies on experiences and intuitions into evidence-based blending.