

A system for screening compounds that alter smell perception

Unmet Need

Olfactory sensation profoundly influences a person's quality of life. In addition to the aesthetic aspects of life associated with olfactory sensation, approximately 2 million Americans experience some type of olfactory dysfunction. Studies show that olfactory dysfunction affects at least 1% of the population under the age of 65 years, and well over 50% of the population older than 65 years. The sense of smell determines the flavor of foods and beverages and serves as an early warning system for the detection of environmental hazards, such as spoiled food, leaking natural gas, smoke, or airborne pollutants. However, human olfactory perception differs enormously between individuals. There is a need for methods that can not only identify modulators of olfactory perception, but also take into account olfactory reception variation across people when designing new consumer products or olfactory dysfunction therapeutics.

Technology

Duke inventors have developed a system for screening compounds that affect odor perception. This can be used to identify molecules for fragrance and flavor consumer products as well as help create therapeutics that treat olfactory dysfunction. Specifically, this is a cell-based assay comprising the human odorant receptor OR7DR that measures its response to test compounds. The researchers have identified that genetic differences in OR7D4 are linked to the perception of the human sex pheromones androstenone and androstadienone. This was confirmed by demonstrating that genetic variation of OR7DR affected a person's perception of cooked meats containing androstenone. This technology has been used to screen



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Publication(s)

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External Link(s)

• [From the lab of Dr. Hiraoki Matsunami](#)

66 chemicals of which androstenone and androstadienone were identified as modulators of OR7D4.

Other Applications

This technology can also be used to help further research into the olfactory system and its connection to other bodily systems, like diminished sensation of smell being linked to neurological diseases such as Alzheimer's or Parkinson's.

Advantages

- Easily screens for olfactory modulating compounds or therapeutics that target OR7D4
- Takes into account the genetic variation responsible for differences in smell perception
- Identified compounds have been validated to translate well to human olfactory perception

