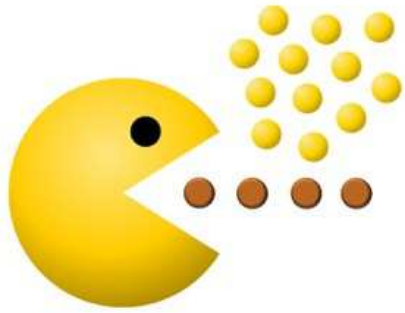
ODOR ENHANCERS AT THE BACK OF THE NOSE!

It is well-known that when we smell an odor, thousands of odorous molecules enter our nasal cavity, reach our olfactory mucosa and stimulate our olfactory receptors which send an olfactory message to the brain. What is less well-understood is that the olfactory mucosa also contains dozens of enzymes near to the olfactory receptors.

Over the last few years, CSGA researchers have shown that some of these enzymes ensure odorant clearance from the olfactory receptor environment. This crucial process avoids the saturation of the receptors to maintain the olfactory sensitivity at its highest level. This research also demonstrated that a single enzyme can metabolize different odorous molecules. This could induce competitive interaction between the molecules and consequently impact olfactory perception.

To improve understanding of these phenomena, Jean-Marie Heydel's team, in collaboration with Gérard Coureaud (Neuroscience Research Center, Lyon), has studied the sucking-related behavior in newborn rabbits exposed to a mixture of two odorous molecules. A molecule secreted in rabbit milk, the mammary pheromone ●, triggers the sucking behavioral reflex in the newborn rabbit as soon as the animal smells its odor. Surprisingly, the researchers observed a sucking reflex when the mammary pheromone was presented to the newborn rabbit at a concentration that should not trigger this reflex, when it was mixed with a challenger odorant ●, that alone has no effect on the sucking behavior. In fact, the competition between the pheromone and the challenger at the enzyme level induced an accumulation of the pheromone in the nasal cavity, allowing the concentration to be high enough to trigger the sucking reflex.



This study suggests that competitive interaction at the nasal enzymes level can significantly impact the perceived quality and/or the perceived intensity of odorants in mixture. Experiments under way in the laboratory suggest that these phenomena could also occur in humans.

Contact

Jean-Marie HEYDEL, jean-marie.heydel@u-bourgogne.fr

To know more

Hanser HI, Faure P, Robert-Hazotte A, Artur Y, Duchamp-Viret P, Coureaud G, Heydel JM (2017). Odorant-odorant metabolic interaction, a novel actor in olfactory perception and behavioral responsiveness. Scientific Reports, 7:10219.

Key words

Olfaction; odorous molecule; olfactory mucosa; olfactory receptor; enzyme; perception; mammary pheromone