

ENZYMES ARE COUNTER-ATTACKING IN THE NASAL MUCUS !

Episode 1. The Rabbit

In mammalian noses, the surface of olfactory tissues is covered by a thin layer of mucus that prevents the tissues from drying out. This mucus also plays an important role in olfaction due to the enzymes it contains. Indeed, these enzymes modify the chemical structure of the odorous molecules to make them inactive and thus prevent the saturation of the olfactory receptors. By "cleaning" the nose, these enzymes preserve the olfactory sensitivity.

In collaboration with Gérard Coureaud (Lyon Neuroscience Research Center), Jean-Marie Heydel and his team studied the composition and role of rabbit nasal mucus. In this species, it has been shown that a molecule secreted in the rabbit's milk, called mammary pheromone, triggers a suckling reflex in the newborn rabbit as soon as it is perceived. The researchers began by demonstrating the presence of enzymes in the nasal mucus of the young rabbit. In order to do so, they used mass spectrometry, a technique that can detect and identify all molecules present in tissues and body fluids. The researchers then demonstrated the ability of nasal mucus to metabolize mammary pheromone using a real-time analytical technique developed in rats.

(cf https://www2.dijon.inra.fr/csga/doc/actualite/juillet_2016_muqueuse_olfactive.pdf)

Finally, the researchers washed the noses of the young rabbits to remove mucus and subjected the animals to a concentration of mammary pheromone below the detection limit. Although this concentration is insufficient to trigger a suckling reflex under normal conditions, the researchers observed a suckling reflex in animals that had undergone a nose wash. In other words, nose washing removed enough enzymes to cause pheromone to accumulate in the nasal cavity and reach a threshold concentration sufficient to trigger the reflex. These results highlight the importance of nasal mucus and the enzymes it contains in regulating olfactory mechanisms.

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To know more

Robert-Hazotte A, Faure P, Neiers F, Potin C, Artur Y, Coureaud G, Heydel JM (2019). Nasal mucus glutathione transferase activity and impact on olfactory perception and neonatal behavior. *Scientific Reports*, 9, 3104.

Key words

Olfaction ; olfactory mucosa ; nasal mucus; enzyme ; rabbit



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