

Smells of organic substances

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In the last decade of the twentieth century a true revolution took place in the science of smells. The decisive role was played by the discovery of 1000 types of olfactory receptors which bind molecules of odoriferous substances. However the smell perception mechanism isn't fully explored.

According to the sterile theory of Moncriffe the smell was felt if air-borne molecules were complementarily "integrated" into certain parts of the receptors of the olfactory nervous system. Later on J. Eymour developed the theory of R. Moncriff. and defined how many kinds of receptors exist, their size and shape.

Both theories influenced the modern understanding of the odor perception mechanism. Currently, there are several features of the sense of smells in humans. Olfactory analyzer is a neurophysiological system that analyzes odorous substances that affect the mucosa of the nasal cavity. Olfactory analyzer consists of the peripheral part (olfactory receptors), specific conductive neural pathways (olfactory nerve and central olfactory pathway), subcortical nerve structures (papillae) and cortical (convolutions of the sea horse).

Reception of odorous substances is carried out by primary feeling receptor cells. Their peripheral shoots are supplied with club-shaped thickenings, to-rye act over a cellular surface of an olfactory epithelium and come to an end with a bunch of thin olfactory hairs (flagellums, or the cilia) shipped in a layer of slime. Olfactory hairs increase the general surface of olfactory cells in tens of times. The central shoots of olfactory cells form olfactory nerve. Primary interaction of molecules of odorous substances with olfactory cells includes several consecutive stages: odorous substance is delivered to a surface of an olfactory epithelium with an air flow or way of diffusion, is dissolved in a layer of slime and contacts receptive sites on a surface of olfactory cells, forming complexes with components (proteinaceous) them tsrltoplazmaticheskoy membranes: formation of such complexes leads to change of ion permeability of a membrane and development of receptor potential.

Axons of bipolar neurons gathering in a bundle of the olfactory nerve, penetrate through the holes in the perforated plate of the latticed bone into the cranial cavity and enter the olfactory bulb. From the mitral cells of the olfactory bulb the central olfactory path begins and ends in the temporal basal parts of the brain in the region of the convolutions of the sea horse. In this way the olfactory analyzer in humans works.

It is widely believed that a person is more sensitive to unpleasant odors. For eg., free butyric acid like all carboxylic acids with a small number of carbon atoms has a sharp odor.

From the molecular point of view it is necessary to define the units of smell intensity measurement, the quality of smell, parameters distinguishing one smell from another, their characteristics and pathways of odor transformation into brain signals that encourage a person to make purchases.