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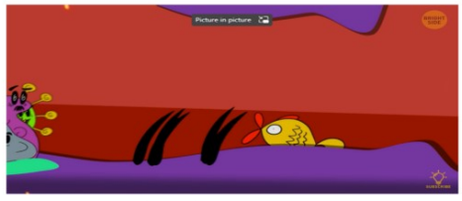
Your entire olfactory system is connected to your brain in unique ways, making it a more powerful and memorable sense in some interesting ways. First, here is a guide to the major parts of your olfactory system.



A Journey in Your Nose to See How Smell Works

When you breathe in through your nose, odor molecules are drawn into your nose and past the top of your nose, called the olfactory cleft. Bony cushions in your nose, called turbinates, help bring in air and odor molecules. Turbinates also direct, filter, humidify and warm-up air as it enters your nose. Once in your nose, molecules dissolve on the olfactory epithelium, which is a layer of mucus in your nose. There are millions of sensory neurons in this thin strip of tissue, and they assist in translating odor molecules into distinct smells.

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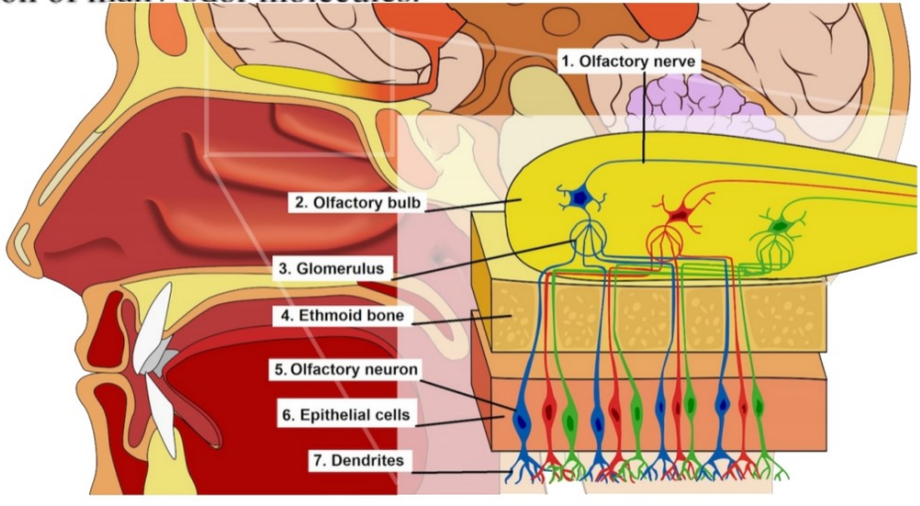
Dissolved odor molecules are quickly spread throughout your nose with the help of special proteins. These proteins guide dissolved molecules to cilia, which are hair-like structures in your nose and are attached to receptor cells. Humans have about 450 of these olfactory receptors. Dogs have at least twice as many receptor cells, which is why their sense of smell is so powerful. There are several different types of sense receptors, and each one activates different odor molecules.

Depending on how strong a bond is formed between the dissolved odor molecule and a particular sense receptor, that receptor sends a slightly different signal. Each individual smell we encounter is actually a combination of many odor molecules.



The 20 Animals with the Strongest and Best Sense of Smell - A-Z Animals

Top 10 Animals With the Best Sense of Smell - YouTube

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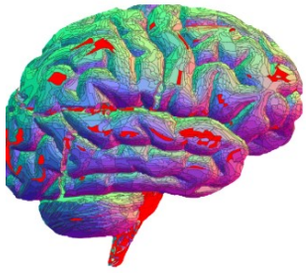
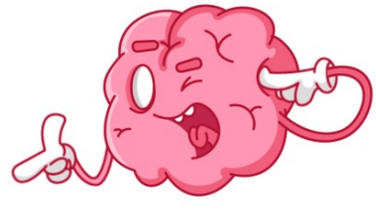


Once molecules bind to your olfactory receptors, these receptors send a signal through your axons. Axons are tiny nerve fibers that connect your brain and your olfactory receptors. They pass through the cribriform plate, which is the layer of bone at the base of your skull. Your body has bundles of thousands of axons that act together to create olfactory nerves. Imagine an olfactory nerve like a rope or electric cable that's made up of hundreds of individual strands.

Once inside your skull, axons connect to the olfactory bulb. This structure is at the base of the forebrain and is connected to many areas throughout your brain. It works to process scents and relays the information to some key areas of your brain. Here are some of the more important parts of your brain connected to your olfactory bulb:

- Thalamus
- Piriform cortex
- Orbitofrontal neocortex
- Limbic system



The thalamus is a relay station for all your senses. The signals from your olfactory bulb work with other senses, like your sense of smell, and transmit this collected information to your orbitofrontal cortex. This is why your senses of taste and smell are linked so strongly.

Other areas of your brain that the thalamus sends signals include your hippocampus and amygdala. These areas are strongly involved in memory and learning processes. This link is a key part of the explanation of smell and memory. A smell that takes you back to your childhood reminds you of a friend or causes you to feel intense emotions is due to this link. The limbic system is also connected to this process.