

SENSE OF SMELL

Aromatherapy is a form of alternative medicine where aromatic oils, extracted from plants, are used to treat a variety of disorders. Aromatherapists claim particular success in the treatment of stress-related conditions and this matches our experience that some fragrances can have a calming, soothing effect on our mood.

Odours can produce a variety of other responses. A common experience is for an odour to remind us of a particular event, place or person from our past. Many fragrances provoke the same or similar response in most individuals.

Odors are tiny molecules of chemicals from things like food, or flowers or poop that float through the air. Many odors aren't single scents or single kinds of molecules but a whole mixture of them.

Smell is one of the chemical senses, the other being taste. They are so called because they sense chemicals, and smells are, of course, chemicals. With these senses we sample our environment for information. We are continuously testing the quality of the air we breathe (this will alert us to potential dangers, e.g. smoke) as well as using this sense to inform us of other relevant information, such as the presence of food or another individual. The chemicals detected by our sensory systems need to have certain properties. For instance, odour molecules must be small enough to be volatile (greater than 300-400 relative molecular mass) so that they can vapourise, reach the nose and then dissolve in the mucus. This tells us that smell, unlike taste, can signal over long distances (an early warning device). We appear to have an innate ability to detect bad, aversive smells. One-day old babies give facial expressions that indicate rejection when given fish or rotten egg odour.

But, is our olfactory system doing more than just giving us warnings? Yes, of course. Amongst other possibilities, it serves a recognition function. We all have our own unique smell (some more pleasant than others!) and can recognise and be recognised by our smell.

Children can distinguish between the smell of their siblings and other children of the same age. Babies recognise their own mothers' smell and mothers recognise their own babies' smell. Emotion can be communicated by smell. The emotions of others, for example fear, contentment, may therefore be experienced and communicated by smell. Memory is often associated with smell. Smell and memory are intimately linked.

How we smell (some estimates suggest we can distinguish around 10,000 different smells), why we smell and the impact of smell to our everyday life are poorly understood. We certainly underestimate the importance of smell to our well-being - ask an anosmic (someone who has lost some or all of their sense of smell). There are suggestions that smell can influence mood, memory, emotions, mate choice, the immune system and the endocrine system (hormones). We can communicate by smell - without knowing it. In fact the sense of smell could be said to be at the mind-body interface.

How do we smell?

Smell depends on sensory receptors that respond to airborne chemicals. You are able to detect thousands of different smells. The receptors that sense smells are called olfactory receptors. They occupy a stamp-sized area in the roof of our nasal cavity, the hollow space inside our nose.

How we smell is a very complex process involving a part of our nose and various parts of our brain. We have the ability to recognize up to 10,000 separate odors but each

thing we smell needs to be volatile (capable of entering a gaseous state) for our senses to be able to detect and identify it.

Noses come in all shapes and sizes externally but the external features are only for the passage of air as we breathe. Internally, olfactory epithelium (mucous membranes) located on the roof and upper part of both walls of the nasal cavity are the part of the nose that detects odors. This epithelium "contains some 5 million olfactory neurons, plus their support cells and stem cells...each topped by at least 10 hair-like cilia". During normal breathing the inhaled air slightly touches the cilia so that odors can be detected from the environment. Sniffing, which is deliberate, strong inhalation of air through our nose, pulls the air deeply into the cilia to increase the amount and strength of the odor that has been detected by increasing the amount of the gaseous chemicals that come into contact with the cilia.

For detection to occur the cilia are covered with a thin film of mucous that is necessary to dissolve the chemicals in the gaseous substance that carries the odor. It is estimated that each cilia cell has between 500 and 1,000 receptor proteins that are genetic in nature and determine which odors our brains can detect and identify according to which receptors are activated by the odor. Each neuron is connected, via a synapse to the olfactory bulb, which is part of the brain, by a long fiber called an axon. The axon passes through the bone above the neurons, called the cribiform plate. It is in the olfactory bulb that the first impressions are made. "Olfaction is.... the most direct interface between the brain and the outside world".

Once the odors have triggered the receptorsites, the olfactory bulb sends nerve impulses, via the olfactory bundles, to the thalamus (which then transmits the impulses to the neocortex) and to the hypothalamus. Its in the neocortex that olfactory discrimination, perception and memories occur allowing us to correctly identify what it is we are smelling.

Breathing is Living

Mother Nature's herbal remedies can be used very effectively to treat both physical and mental conditions.

Respiratory conditions such as sinus, sore throat, congestion, colds and flu, not to mention some of today's more challenging air borne diseases, can be treated in this manner. One's state of mind can be greatly influenced through the sense of smell. The quality of air we breathe is essential to our state of mind.