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PATHWAY INVOLVED IN TASTE

The tongue contains small bumps called papillae, within or near which taste buds are situated. In the tongue's taste buds, the taste receptors receive sensory input via, two important mechanisms are:

- Depolarization
- neurotransmitter release.

Intake of salty foods leads more sodium ions to enter the receptor, causing the said mechanisms. The same is true with intake of sour foods (hydrogen ions) and sweet foods (sugar molecules), both of which result to the closing of K^+ channels upon their entry.

The papillae are innervated by the nervus glossopharyngeus and the nervus vagus. These nerves proceed to the nucleus tractus solitarii of the brain stem. The information is switched over to the second neuron and transferred ipsilaterally to the third neuron in the nucleus parabrachialis of the formation reticularis.

This neuron projects into the contralateral nucleus ventralis posterior of the thalamus. The thalamus transfers the information to different areas of the brain. There, we become conscious of taste and of links to other perceptions i.e. the sense of smell.

➤ **THE SENSORY PATHWAY OF THE TASTE RECEPTORS**

From the axons of the taste receptors, the sensory information is transferred to the three taste pathways via the branches of cranial nerves VII, IX and X. The chorda tympani of CN VII (facial nerve) carries the taste sensory input from the tongue's anterior two-thirds.

➤ **THE NERVE PATHWAYS INVOLVED IN TASTE**

Three nerves carry taste signals to the brain stem:

- The chorda tympani nerve (from the front of the tongue),
- the glossopharyngeal nerve (from the back of the tongue) and
- the vagus nerve (from the throat area and palate). In addition, the trigeminal nerve carries signals from the touch /temperature / pain system.

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Taste signals combine in the brain stem areas involved in arousal (i.e. from sleep) then with smell signals in the brain to produce the sensation of flavor

➤ **THE THREE TYPES OF TASTE RECEPTORS**

The gustatory system consists of taste receptor cells in taste buds. Taste buds, in turn, are contained in structures called papillae. There are three types of papillae involved in taste:

- fungiform papillae,
- foliate papillae, and
- circumvallate papillae.

➤ **THE FUNCTION OF TASTE RECEPTORS**

The sensory information is transferred to the three taste pathways via the branches of cranial nerves VII, IX and X. The chorda tympani of CN VII (facial nerve) carries the taste sensory input from the tongue's anterior two-thirds. Then, the rest of the taste sensations from the throat, palate and posterior tongue are transmitted by the branches of CN IX (glossopharyngeal nerve) and CN X (vagus nerve). From these cranial nerves, taste sensory input travels through the nerve fiber synapses to the solitary tract, the ventral posteromedial thalamic nuclei, and the thalamus. In these three locations, there are

- clustered neurons which respond to the same taste (sweet, sour, salty or bitter).
- The thalamus relays the information to the primary gustatory cortex located in the somatosensory cortex.

- The primary gustatory cortex is where the perception of a particular taste is processed.