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### **QUESTION**

Elucidate the pathway involved in Taste

### **ANSWER**

- PATHWAY FOR 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. 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.

- RECEPTORS

Receptors for taste sensation are the type III cells of taste buds. Each taste bud is innervated by about 50 sensory nerve fibers and each nerve fiber supplies at least five taste buds through its terminals.

- FIRST ORDER NEURON

First order neurons of taste pathway are in the nuclei of three different cranial nerves, situated in medulla oblongata. Dendrites of the neurons are distributed to the taste buds. After arising from taste buds, the fibers reach the cranial nerve nuclei by running along the following nerves:

1. Chorda tympani fibers of facial nerve, which run from anterior two third of tongue
2. Glossopharyngeal nerve fibers, which run from posterior one third of the tongue
3. Vagal fibers, which run from taste buds in other regions.

Axons from first order neurons in the nuclei of these nerves run together in medulla oblongata and terminate in the nucleus of tractus solitarius.

- SECOND ORDER NEURON

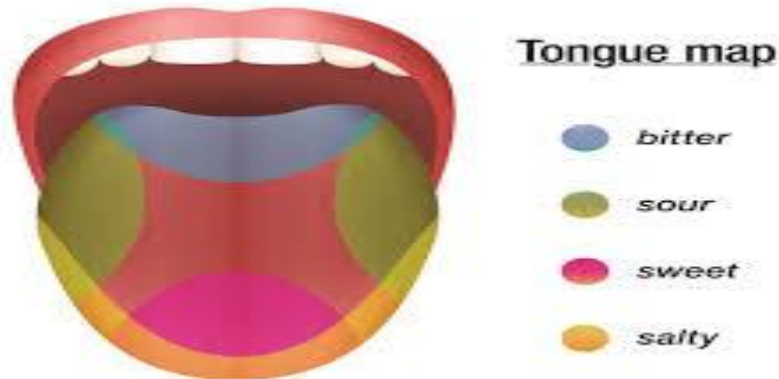
Second order neurons are in the nucleus of tractus solitarius. Axons of second order neurons run through medial lemniscus and terminate in posteroventral nucleus of thalamus.

- THIRD ORDER NEURON

Third order neurons are in the posteroventral nucleus of thalamus. Axons from third order neurons project into parietal lobe of the cerebral cortex.

- TASTE CENTER

Center for taste sensation is in opercular insular cortex, i.e. in the lower part of post central gyrus, which receives cutaneous sensations from face. Thus, the taste fibers do not have an independent cortical projection.



## Gustatory Pathway from Taste Buds

Taste information reaches the cerebral cortex

Primarily through the facial (VII) and glossopharyngeal (IX) nerves

Some taste information through the vagus nerve (X)

Sensory neurons synapse in the medulla

Located in the solitary nucleus

