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Sensory Receptors

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A sensory receptor is a structure that reacts to a physical stimulus in the environment, whether internal or external. It is a sensory nerve ending that receives information and conducts a process of generating nerve impulses to be transmitted to the brain for interpretation and perception. Sensory receptors vary in classifications but generally initiate the same process of registering stimuli and creating nerve signals.

The banner features the Explorable logo and the text "Quiz Time!". Below this, there are three quiz cards:

- Card 1: Image of red roller skates on a wooden deck. Quiz: Psychology 101 Part 2
- Card 2: Image of a fan of colorful pencils. Quiz: Psychology 101 Part 2
- Card 3: Image of a Ferris wheel at sunset. Quiz: Flags in Europe

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Functions

In a sensory system, sensory receptors serve as the front-liners because they are in contact with the stimulus. Taste or gustatory receptors, odor or olfactory receptors have receptor molecules which undergo a process of binding to chemicals in the stimuli. For instance, the chemicals in food interaction with the taste receptors of the taste bud so that an action potential or a nerve signal can be created. Other sensory receptors function by means of transduction.

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chemicals in food interaction with the taste receptors of the taste bud so that an action potential or a nerve signal can be created. Other sensory receptors function by means of transduction. Photoreceptors of the eye contain rhodopsin and other proteins that transduce or transform light energy into electrical impulses. Without these sensory receptors, both sensation and perception cannot occur.

Classifications

Stimulus modality is defined as an aspect of a stimulus that could be light, sound, taste, temperature, smell, pressure, etc. Because there are different stimulus modalities, sensory receptors also vary in terms of adequate stimulus, morphology, and location.

By Adequate Stimulus

Adequate stimulus refers to the property of a sensory receptor that describes the type of energy to which the sensory receptor reacts to. In short, adequate stimulus is the ability of a sensory receptor to determine the stimulus modality. Sensory receptors that are classified according to their adequate stimulus include the following:

Sensory Receptor	Adequate Stimulus (sensory receptor response)
Ampullae of Lorenzini (electroreceptors)	electric fields, salinity, temperature
Baroreceptors	pressure in blood vessels
Chemoreceptors	chemical stimuli
Hydroreceptors	humidity changes
Mechanoreceptors	mechanical stress or mechanical strain
Nociceptors	damage to body tissues (which leads to pain perception)
Osmoreceptors	osmolarity of fluids
Photoreceptors	light
Proprioceptors	sense of position
Thermoreceptors	temperature, heat, cold or both
Electromagnetic receptors	electromagnetic waves
Pacinian Corpuscles	pressure on skin; weight of an object
Meissner's Corpuscles	fine touch

By Morphology

Sensory receptors that are classified according to morphology or form are usually divided into two main groups: free nerve endings and encapsulated receptors. Free nerve endings such as thermoreceptors and nociceptors have unmyelinated terminal neuronal branches (i.e. no myelinated sheath or protection, thus they are bare). Encapsulated receptors such as Meissner's and Pacinian corpuscles are protected by layered connective tissue.

By Location

The types of sensory receptors according to location include cutaneous receptors and mechanoreceptors. Sensory receptors located in the dermis or epidermis of the skin are called cutaneous receptors. These include nociceptors and thermoreceptors. Mechanoreceptors, on the other hand, are located in muscle spindles, enabling them to detect muscle stretch. Other receptors are located inside the body, such as the baroreceptors in the blood vessels.

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