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THE SOMATOSENSORY SYSTEM

The somatosensory system is a part of the sensory nervous system, the somatosensory system a complex system of sensory neurons and neural pathways that responds to changes at the surface or inside the body. The axons of sensory neurons connect with , or respond to various receptor cells. These sensory receptor cells are activated by different stimuli such as heat and nociception , giving a functional name to the responding sensory neuron, such as a thermometer which carries information about temperature changes . Other types, include memechanoreceptors , chemoreceptors and nocireceptors which sends signals along a sensory nerve neurons and then relayed to the brain for futher processing . Sensory receptors are found all over the body including the skin, epithelial tissues ,muscles ,bones,joints, internal organs and the cardiovascular system.

Somatic senses are sometimes referred to as somesthetic senses, with the understanding that somesthesis includes the sense of touch, proprioception (sense of position and movement) , and (depending on usage)haptic perception. The mapping of the body surfaces in the brain is called somatotopy, in the cortex it is also referred to as the cortical homunculus.

SOMATOSENSORY PATHWAYS

A somatosensory pathway will typically have 3 neurons ; first order , second order , and third order

* The first order neuron is a type of pseudounipolar neuron and always has it cell body in the dorsal root ganglion of the spinal nerve with peripheral axon innervating touch mechanoreceptors and a central axon synapsing on the second order neuron .if the somatosensory pathway is in parts of the head or neck not covered by the cervical nerves , the first order neuron will be the trigeminal nerve ganglia or the ganglia of other sensory cranial nerves .
* The second order neuron has its cell body either in the spinal cord or in the brainstem . This neurons ascending axon will cross (decusate) to the opposite side either in the spinal cord or in the brainstem.
* In the case of touch and certain types of pain , the third order neuron has its cell body in the ventral posterior nucleus of the thalamus and ends in the posterior nucleus of the thalamus and ends in the postcentral gyrus of the parietal lobe in the primary somatosensory cortex (or s1).

Photoreceptors , similar to those found in the retina of the eye , detect potentially damaging ultra violet radiation (ultraviolet A specifically) , including increased production of melanin by melanocytes.Thus tanning potentially offers the skin rapid protection from DNA damage and sunburn caused by ultraviolet radiation ( DNA damage caused by ultraviolet B ).