Somatosensory system

The somatosensory system, also known as somatic senses, touch or tactile perception, is a complex sensory system. It is considered one of the five traditional senses. It is made up of a number of different receptors, including thermoreceptors, photoreceptors, mechanoreceptors and chemoreceptors. It also comprises essential processing centres, or sensory modalities, such as proprioception, mechanoreception (touch), thermoception (temperature), and nociception (pain). The sensory receptors cover the skin and epithelial tissues, skeletal muscles, bones and joints, internal organs, and the cardiovascular system.

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see somatosensory cortex.

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While touch (also called tactile perception) is considered one of the five traditional senses, the impression of touch is formed from several modalities including pressure, skin stretch, vibration and temperature. In medicine, the colloquial term “touch” is usually replaced with “somatic senses” to better reflect the variety of mechanisms involved.

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Processing primarily occurs in the primary somatosensory area in the parietal lobe of the cerebral cortex: information is sent from the receptors via sensory nerves, through tracts in the spinal cord and finally into the brain.

The cortical homunculus, a map of somatosensory areas of the brain, was devised by Wilder Penfield. The system works when activity in a sensory neuron is triggered by a specific stimulus such as pain, for instance. This signal then passes to the part of the brain attributed to that area on the body—this allows the stimulus to be felt at the correct location. The mapping of the body surfaces in the brain is called a homunculus and plays a fundamental role in the creation of body image. This brain-surface (“cortical”) map is not immutable, however. Dramatic shifts can occur in response to stroke or injury.