THE SOMATOSENSORY PATHWAYS.

Somatosensory pathways consist of the chain of neurons, from receptor organ to cerebral cortex, that are responsible for the perception of sensations. All somatosensory pathways include a thalamic nucleus. The thalamic neurons send their axons in the posterior limb of the internal capsule to end in the cerebral cortex. Most somatosensory pathways terminate in the parietal lobe of the cerebral cortex.

A somatosensory pathway will typically consist of three neurons: primary, secondary, and tertiary.

1. In the periphery, the primary neuron is the sensory receptor that detects sensory stimuli like touch or temperature. The cell body of the primary neuron is housed in the dorsal root ganglion of a spinal nerve or, if sensation is in the head or neck, the ganglia of the trigeminal or cranial nerves.
2. The secondary neuron acts as a relay and is located in either the spinal cord or the brainstem. This neuron's ascending axons will cross, or decussate, to the opposite side of the spinal cord or brainstem and travel up the spinal cord to the brain, where most will terminate in either the thalamus or the cerebellum.
3. Tertiary neurons have cell bodies in the thalamus and project to the postcentral gyrus of the parietal lobe, forming a sensory homunculus in the case of touch. Regarding posture, the tertiary neuron is located in the cerebellum.

The sensory information processed by the somatosensory systems travels along different anatomical pathways depending on the information carried. For example, the posterior column-medial lemniscal pathway carries discriminative touch and proprioceptive information from the body, and the main sensory trigeminal pathway carries this information from the face. Whereas, the spinothalamic pathways carry crude touch, pain and temperature information from the body, and the spinal trigeminal pathway carries this information from the face. The posterior (dorsal) column - **medial lemniscal pathway**, carries and processes discriminative touch and proprioceptive information from the body. It is important to keep in mind that within the medial lemniscal pathway, the afferents carrying discriminative touch information are kept separate from those carrying proprioceptive information up to the level of the cerebral cortex.