The role of sensory signals in perception of the body / Masanori Sakamoto

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Abstrak

Humans perceive their body posture, size, and position in space even when they do not look at their body. The ability to perceive the body correctly is essential to move accurately in space. The purpose of this review is to introduce the reader to the latest views on the role of peripheral afferent signals in the generation and alteration of perception of the body. First, the contribution of proprioceptive and cutaneous signals to perception of the body is introduced. Common methods to investigate these signals are muscle vibration, skin stretch, or electrical stimulation. These methods provide evidence that the perception of the body is flexible. Second, effects of multisensory integration on perception of the body are described. The combination of visual, tactile, proprioceptive, and auditory signals alter the perception of the body, suggesting that multiple sensory signals contribute to perception of the body. Third, the distortion of perception of the body after the loss of sensory signals is reviewed. Anesthesia or amputation of limbs, as well as experimentally-induced disintegration of sensory signals drastically alter the perception of the body. Fourth, neural mechanisms underlying the generation, or alteration, of perception of the body is described. The premotor and parietal cortices play a key role in perception of the body, as they are involved in multisensory integration. In the final section of the review, implications of the ways sensory information shapes perception of our body are discussed for athletic performance.