

# Searching for proprioceptors in human facial muscles

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The human craniofacial muscles innervated by the facial nerve typically lack muscle spindles. However these muscles have proprioception that participates in the coordination of facial movements. A functional substitution of facial proprioceptors by cutaneous mechanoreceptors has been proposed but at present this alternative has not been demonstrated. Here we have investigated whether other kinds of sensory structures are present in two human facial muscles (zygomatic major and buccal). Human cheeks were removed from Spanish cadavers, and processed for immunohistochemical detection of nerve fibers (neurofilament proteins and S100 protein) and two putative mechanoproteins (acid-sensing ion channel 2 and transient receptor potential vanilloid 4) associated with mechanosensing. Nerves of different calibers were found in the connective septa and within the muscle itself. In all the muscles analysed, capsular corpuscle-like structures resembling elongated or round Ruffini-like corpuscles were observed. Moreover the axon profiles within these structures displayed immunoreactivity for both putative mechanoproteins. The present results demonstrate the presence of sensory structures in facial muscles that can substitute for typical muscle spindles as the source of facial proprioception. © 2017 Elsevier B.V.

Facial muscles

Mechanoproteins

Proprioceptors

Sensory corpuscle-like structures

vanilloid receptor 4

acid sensing ion channel

ASIC2 protein, human

TRPV4 protein, human

vanilloid receptor

adult

aged

Article

cadaver

face muscle

facial nerve

female

human

immunoreactivity

male

mechanoreceptor

muscle spindle

priority journal

proprioception

quantitative analysis

Schwann cell

superficial musculoaponeurotic system

trigeminal nerve

anatomy and histology

cheek

face muscle

innervation

metabolism

middle aged

Acid Sensing Ion Channels

Aged

Cheek

Facial Muscles

Female

Humans

Male

Mechanoreceptors

Middle Aged

Proprioception

TRPV Cation Channels