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★平成29年度卒業生「中嶋亮介君、上原愛理さん」の研究成果が疼痛に関わる国際的専門誌(オープンアクセスジャーナル)"Journal of Pain Research"に掲載されました!!!

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Decanoic acid attenuates the excitability of nociceptive trigeminal primary and secondary neurons associated with hypoalgesia

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Background: Acute application of decanoic acid (DA) in vivo suppresses the excitability of spinal trigeminal nucleus caudalis (SpVc) wide dynamic range (WDR) neurons associated with the short-term mechanical hypoalgesia via muscarinic M2 receptor signaling; however, the effect of DA on nociceptive trigeminal ganglion (TG) and SpVc nociceptive-specific (NS) neuronalexcitability under in vivo conditions remains to be determined. The present study investigated whether this effect could be observed in naive rats.

Results: Extracellular single-unit recordings were made from TG and SpVc NS neurons of pentobarbital-anesthetized rats in response to orofacial noxious mechanical stimuli. DA inhibited the mean firing frequency of both TG and SpVc NS neurons, reaching a maximum inhibition of discharge frequency within 1–5 minutes and reversing after approximately 10-minutes;however, this DA-induced suppression of SpVc NS neuronal firing frequency did not occur in rats administered with methoctramine intravenously prior to stimulation.

Conclusion: This in vivo study indicated that firing of TG and SpVc NS neurons induced by mechanical hypoalgesia through peripheral M2 receptors could be inhibited by acutely administered DA, implicating the potential of DA in the future treatment of trigeminal pain.

Perspective: This article presents that the acute DA application suppresses the excitability of TG and SpVc NS neurons associated with mechanical hypoalgesia via peripheral M2 receptor signaling, supporting DA as a potential therapeutic agent in complementary and alternative
medicine for the attenuation of nociception.

ハイライト：デカン酸(脂肪酸)を主成分とするAnti Pain軟膏(総合南東北病院：赤間洋一先生)は、これまでの本研究室の研究で皮膚を支配する2次侵害受容ニューロンの活動を末梢終末に発現するアセチルコリンムスカリンM2受容体の活性化により、鎮痛効果が発現することが判明していました。今回著者らは皮膚を支配する一次侵害受容ニューロンの興奮性の変化が、デカン酸によりアセチルコリンムスカリンM2受容体を介して抑制されることを明らかとした。本研究の成果は食品成分であるデカン酸が、疼痛伝達に関わる神経線維のみに作用し、疼痛緩和薬となる可能性と代替医療に貢献することを示唆している！