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★平成28年度卒業生「荒川殊帆さん、井上もがみさん」の研究成果が口腔科学の国際的専門誌“Journal of Oral Biosciences”に掲載されました!!!

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Dietary constituent genistein inhibits the hyperexcitability of trigeminal nociceptive neurons associated with mechanical hyperalgesia following orofacial inflammation

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Objectives: Genistein, a dietary constituent, modulates voltage-dependent and ligand-gated ionic channels, suggesting that it could also attenuate inflammatory hyperalgesia. However, the mechanism underlying how genistein affects inflammation-induced hyperexcitability of nociceptive neurons in vivo remains to be determined. The present study therefore investigated whether administration of genistein could attenuate the inflammation-induced hyperexcitability of trigeminal spinal nucleus caudalis (SpVc) neurons associated with mechanical hyperalgesia in vivo.

Methods: Inflammation was induced by injection of complete Freund's adjuvant into the whisker pad. The mechanical thresholds for escape behavior and electrophysiological single-unit recording of SpVc neurons responding to mechanical stimulation were then conducted in naïve rats, inflamed rats, and inflamed rats with genistein administered intraperitoneally.

Results: The lowered mechanical threshold in the inflamed rats was returned to control level following administration of genistein for 2 days. The mean number of discharge frequencies of SpVc neurons in inflamed rats was significantly decreased after genistein administration with both non-noxious and noxious mechanical stimuli. The increased spontaneous discharges of SpVc neurons in inflamed rats were significantly decreased after genistein administration. Noxious pinch-evoked after-discharge frequency and occurrence in inflamed rats was also significantly diminished after genistein administration, and expansion of the receptive field was significantly returned to control levels in inflamed rats.

Conclusion: Herein, we present the first evidence that genistein attenuates hyperexcitability of SpVc neurons associated with

ハイライト：これまで *in vitro* の実験系において、大豆などに多く含まれる食品成分の一つである”イソフラボン“が神経細胞の興奮性に関わるイオンチャネルを修飾することが判明していたが、今回、著者らは ラットを用いた*in vivo*の実験系においてイソフラボンの全身投与が濃度依存性に痛覚過敏行動を有意に抑制すること、またその機序の一つに疼痛伝達ニューロンの興奮性の増大機構への抑制が関与することを明らかとした。本研究の成果は食品成分の一つであるイソフラボンが炎症性疼痛の治療薬となる可能性、すなわち補完代替医療に貢献することを示唆している。