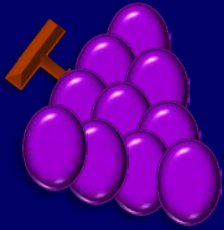


# 食品生理学研究室ニュース2

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## ★当研究室の食品生命科学科 平成27年度 卒業生関口健太君の研究成果が “Molecular Pain 12:1-11(2016)” に掲載されました!!!



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Research Article

### Resveratrol attenuates inflammation-induced hyperexcitability of trigeminal spinal nucleus caudalis neurons associated with hyperalgesia in rats

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#### Abstract

**Background:** Resveratrol, a component of red wine, has been reported to decrease prostaglandin E<sub>2</sub> production by inhibiting the cyclooxygenase-2 cascade and to modulate various voltage-dependent ion channels, suggesting that resveratrol could attenuate inflammatory hyperalgesia. However, the effects of resveratrol on inflammation-induced hyperexcitability of nociceptive neurons in vivo remain to be determined. Thus, the aim of the present study was to determine whether daily systemic administration of resveratrol to rats attenuates the inflammation-induced hyperexcitability of spinal trigeminal nucleus caudalis wide-dynamic range neurons associated with hyperalgesia.

**Results:** Inflammation was induced by injection of complete Freund's adjuvant into the whisker pad. The threshold of escape from mechanical stimulation applied to whisker pad in inflamed rats was significantly lower than in control rats. The decreased mechanical threshold in inflamed rats was restored to control levels by daily systemic administration of resveratrol (2 mg/kg, i.p.). The mean discharge frequency of spinal trigeminal nucleus caudalis wide-dynamic range neurons to both nonnoxious and noxious mechanical stimuli in inflamed rats was significantly decreased after resveratrol administration. In addition, the increased mean spontaneous discharge of spinal trigeminal nucleus caudalis wide-dynamic range neurons in inflamed rats was significantly decreased after resveratrol administration. Similarly, resveratrol significantly diminished noxious pinch-evoked mean after discharge frequency and occurrence in inflamed rats. Finally, resveratrol restored the expanded mean size of the receptive field in inflamed rats to control levels.

**Conclusion:** These results suggest that chronic administration of resveratrol attenuates inflammation-induced mechanical inflammatory hyperalgesia and that this effect is due primarily to the suppression of spinal trigeminal nucleus caudalis wide dynamic range neuron hyperexcitability via inhibition of both peripheral and central cyclooxygenase-2 cascade signaling pathways. These findings support the idea of resveratrol as a potential complementary and alternative medicine for the treatment of trigeminal inflammatory hyperalgesia without side effects.

Keywords : Inflammation, resveratrol, trigeminal system, hyperalgesia, single unit recording, cyclooxygenase

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**ハイライト:** 赤ワインの成分で知られるレスベラトロールは最近、侵害受容性疼痛を抑制することが本研究室の研究で判明している。今回、著者らは末梢組織の炎症に伴い生じる“痛覚過敏の症状”とこの発症に重要な役割を果たす広作動域ニューロンの興奮性の変化がレスベラトロールの慢性投与により抑制されることを明らかとした。本研究の成果はレスベラトロールが臨床の場において非ステロイド性鎮痛薬に変わる新たな副作用のない炎症性疼痛治療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!