

[Print this Page](#)**NEUROSCIENCE 2012**

## Presentation Abstract

Program#/Poster#: 399.15/FFF9

Presentation Title: [Chemical stimulation of central nucleus of amygdala induces yawning response in rats](#)

Location: Hall F-J

Presentation time: Monday, Oct 15, 2012, 10:00 AM -11:00 AM

Authors: \***N. KUBOTA**<sup>1</sup>, S. AMEMIYA<sup>3</sup>, T. NISHIJIMA<sup>3</sup>, S. YANAGITA<sup>2</sup>, I. KITA<sup>3</sup>;<sup>1</sup>Res. Inst. for Sci. and Technol., Tokyo Univ. of Sci., Chiba-Ken, Japan;<sup>2</sup>Tokyo Univ. of Sci., Chiba-ken, Japan; <sup>3</sup>Tokyo Metropolitan Univ., Tokyo, Japan

**Abstract:** Yawning is often observed in not only the states of boredom and drowsiness but also a stressful situation. Additionally, several studies have shown that anxiogenic compounds, which can potently induce anxiety-like behaviors such as grooming and scratching, are often accompanied by yawning responses in monkeys. These reports suggest that yawning might be an emotional behavior through activation of amygdala neurons, because the amygdala is a region mediating emotional expression involved in anxiety or fear. Previous studies have shown that oxytocin (OT) and corticotropin-releasing factor (CRF) neurons in the paraventricular nucleus of hypothalamus (PVN) could be critical for the induction of stereotyped yawning, which is characterized an initial depressor response and an arousal shift in electrocorticogram (ECoG) followed by a single large inspiration with mouth opening. Therefore, we investigated the effect of chemical stimulation of the central nucleus of amygdala (CeA), which is a most important output region for the expression of emotional responses, on yawning responses in anesthetized, spontaneously breathing rats, and compared to the stereotyped yawning response evoked by chemical stimulation of the PVN. Yawning response was evaluated by monitoring intercostals electromyogram as an index of inspiratory activity. We also recorded blood pressure and the ECoG to evaluate autonomic function and arousal responses during yawning, respectively. Microinjection of L-glutamate into the CeA elicited a stereotyped yawning-like response, but the

induction rate of the yawning response by the CeA stimulation was slightly lower than that by the PVN stimulation. Furthermore, these physiological aspects induced by stimulation of the CeA as well as the PVN were associated with a significant increase in c-Fos positive OT and CRF neurons in the PVN. However, the PVN stimulation did not significantly increase c-Fos positive neurons in the CeA. These results indicate that chemical stimulation of the CeA can induce stereotyped yawning response, which would be mediated through activation of OT and CRF neurons in the PVN.

Disclosures: **N. Kubota:** None. **S. Amemiya:** None. **T. Nishijima:** None. **S. Yanagita:** None. **I. Kita:** None.

Keyword(s): YAWNING  
AMYGDALA

PARAVENTRICULAR NUCLEUS (PVN)

[Authors]. [Abstract Title]. Program No. XXX.XX. 2012 Neuroscience Meeting Planner. New Orleans, LA: Society for Neuroscience, 2012. Online.

2012 Copyright by the Society for Neuroscience all rights reserved. Permission to republish any abstract or part of any abstract in any form must be obtained in writing by SfN office prior to publication.