Poster Sessions

学習と記憶III
Learning and Memory III

開催日	2010年09月04日（土）
時　間	11:00 - 12:00
会　場	Poster Room 2

ラット青斑核ノルアドレナリン神経活動は行動選択の難易度依存的に増加する
Noradrenergic neurons are activated depending on the difficulty of decision-making in rat

演題番号：P3-I15

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In difficult choice situation, there are higher demands for exploration and assessment of preferences for optimal decision-making. Previous studies reported that activity of noradrenergic neuron in locus coeruleus (LC) modulates exploration state, in which subjects search for behaviors fitting to task rules. Furthermore, $\alpha 2$ receptor antagonist, idazoxan, which increases the release of noradrenaline (NA), facilitates attentional shift and consequently guides rapid optimization of behavior in appetitive tasks. Therefore, we hypothesize that the more difficult a choice condition is, the more noradrenergic neurons are activated for optimization of choice behavior. To examine this hypothesis, we examined performances of T-maze two-alternative choice task in different difficulties and activation of noradrenergic neuron in LC by double-labeling immunohistochemistry in rats. We manipulated the degree of discriminability between choices by varying the difference of amounts of reward pellets between two arms (0 vs 4, 1 vs 3, 2 vs 2). The data showed that as the discriminability diminished, choice bias to one side arm was reduced and time to enter one of two arms was prolonged, indicating that difficulty of the task could relate to the discriminability, that is, difficulty is the highest in 2vs2 condition. In terms of neuronal activity, we observed that noradrenergic neurons are activated depending on decreasing of the discriminability, that is, 2vs2 condition showed the highest activation of noradrenergic neurons. These results suggest that noradrenalinergic neurons in LC have a role for optimal decision-making.

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