

Abstract of Presentation

Name Makoto Ito	Affiliation Neural Computation Unit, OIST, Japan
Research interest: (URL:) Role of the basal ganglia in decision making	
Presentation Title: Upcoming action encoded in the striatum during a decision-making task	
Abstract : <p>The striatum, which is involved in movement and decision making, has a dorsal-ventral gradient in the input modality from the cortex: the more dorsolateral striatum receives sensorimotor-related information and the more ventral part receives associative and motivational information.</p> <p>To elucidate the distinctive functions of the subregions of the striatum in decision making, we recorded neuronal activities from the dorsolateral striatum (DLS), the dorsomedial striatum (DMS) and the ventral striatum (VS) of rats performing a choice task where a rat was required to keep nose-poking into the center hole during the tone presentation and then to poke either the left or right hole after the offset of the tone. A food pellet was delivered probabilistically depending on the selected poking hole.</p> <p>We isolated 204, 112 and 118 phasically-active neurons from DLS, DMS and VS, respectively. We found that (1) during the tone presentation, the intensity of action command (AC) signal was gradually increased in DLS, but not in DMS and in VS, (2) after the offset of the tone and before the movement initiation for choice, the intensity of AC signal in DMS showed a rapid rise and exceeded that in DLS, and (3) during the execution of choice, AC signal were highest in DMS and lowest in VS.</p> <p>These results indicate that both DLS and DMS, but not VS, are involved in the choice behavior. The temporal patterns of AC signals suggest different information processing in DLS and DMS. While DLS rapidly selects what motor action to take, DMS might also take into account the contextual rule that the action should be withheld until the offset of the tone.</p>	