

NEURONAL ENSEMBLES DYNAMICS IN CA1 HIPPOCAMPUS DURING SPATIAL NAVIGATION TASK WITH GOAL-DIRECTED DECISION MAKING

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The hippocampus participates in the integration of several cognitive processes such as navigation, episodic memory, planning and imagination. In particular, hippocampal place cells are activated at a specific location when an animal navigates, but also, a fast activation of these cells may occur at the start of a pathway in the same order as during navigation (internally generated sequence forward) or at the end of the pathway with an inverted order (internally generated sequence reverse). It has been suggested that these fast activation sequences may be associated with memory or planning processes. Thus, here we analyze the activation sequences of pyramidal CA1 hippocampal neurons during a conditioned stimulus in a spatial navigation task with goal-directed decision making. We imaged calcium activity from CA1 neuronal ensembles in freely moving mice with miniaturized microscopes. We found that there is a low percentage of CA1 cells that are activated during the conditioned stimulus. Nevertheless, the conditioned stimulus prepares CA1 cells to trigger a pathway-specific sequence of neuronal ensembles. All-or-nothing ensemble sequences indicate that CA1 cells are not participating only at the spatial level, and support the recent theory that the hippocampus is involved as a predictive map.

Palabras clave: Hipocampus, ensembles, planning, decision making.

Categoría: Ponencia

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