Rat retrosplenial cortical involvement in wayfinding using visual and locomotor cues

（ラット脳梁膨大後部皮質は 視覚および歩行運動入力により経路識別に関与する）

Summary

The retrosplenial cortex (RSC) has been implicated in wayfinding under different sensory inputs. However, the neural mechanisms of how the RSC constructs spatial representation to code an appropriate route under different sensory inputs are unknown. In this study, rat RSC neurons were recorded while rats ran on a treadmill affixed to a motion stage that was displaced along a figure-8-shaped track. Some RSC neurons responded differentially to different directional displacements, while other neurons responded non-differentially during displacement, but the activity of those neurons correlated with running speed. The ensemble activity of the differential neurons differentiated overlapping directional displacements along a common path of different routes, even when visual or locomotor cues were eliminated where different spatial representations must be created based on different sensory inputs. The present results provide first neurophysiological evidence of a RSC involvement in wayfinding under different spatial representations with different sensory inputs.

Key words; retrosplenial cortex, head direction, locomotion, optic flow, route