

Abstract:

The ability to perceive the Earth's magnetic field has been demonstrated in a variety of animals, including representatives of all five classes of vertebrates. The physiological mechanisms underlying magnetic field sensation, however, remain largely unknown. Behavioral, physiological, neuroethological studies and studies using early response genes as neuronal activation markers indicated that a major role in the perception and processing of magnetic information play trigeminal, vestibular and visual systems. Subsequently, magnetic information seem to be integrated with multimodal sensory and motor information within the hippocampal-entorhinal system. In the majority of studies, however, birds have been used as model organisms. In this work I analyzed the neural substrate of magnetic compass orientation in the mouse strain C57BL/6J using markers c-Fos and Egr1. I found that all the aforementioned systems contain neurons responsive to the experimental magnetic fields. This finding demonstrates a complex processing of the magnetic information at level of the central nervous system.