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Signaling and Cell Migration in Cerebral Cortex Development

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Message from the Guest Editor

The six-layered structure of the cerebral cortex consists of neurons born in the ventricular zone, arranged in orderly layers according to the time of their birth date. An accurate understanding of the mechanisms of neuronal migration is fundamental to understanding the development of the neocortex and the pathogenesis of developmental neurological disorders. New neurons are generated in the ventricular zone in the developing cerebrum and then migrate to their final destination to function. Abnormalities in the migration of neurons during development cause abnormalities in the structure and function of the neocortex, leading to a variety of disorders such as epilepsy and developmental disorders.

During migration, neurons sense various extracellular environmental signals, including biochemical and mechanical cues, and behave in response to these signals. Gene networks and signaling pathways involved in neuronal migration have been identified using various methods. More recently, it has been shown that the earliest-born subplate neurons in the subplate layer facilitate migration mode conversion in radial neuronal migration.



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