

Emergence of D-aspartic acid in the differentiating neurons of the rat central nervous system

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Abstract

The rat embryonic brain was probed with anti-d-aspartic acid (d-Asp) antiserum at different stages of development. At gestational day (E) 12, weak immunoreactivity (IR) of d-Asp was apparent at the hindbrain, midbrain and caudal forebrain, whereas it became more intense and extended over the whole brain at E20. However, IR markedly decreased after parturition. In the region of the immature forebrain at an early stage of development (E12), IR was mainly a characteristic of the cytoplasm of the neuronal cells, while in the more mature hindbrain it was localized in the axonal zone. In the more differentiated forebrain at a later stage of development (E18), the IR became restricted to zones which mainly consisted of axons and processes. Consequently, in the rat central nervous system, d-Asp first emerges during embryonic development as a feature of the cytoplasm and thereafter spreads into the axonal regions of neuronal cells, before disappearing almost completely after parturition.