

Bui chi Bao. 2007. Expression of Ezrin and Radixin in the Developing Mouse Forebrain. MSci. Thesis. Sungkyunkwan University, Department of Anatomy, Suwon, Korea, 31p. (bcbaodk@gmail.com)

ABSTRACT

Ezrin and radixin are members of the ERM (ezrin, radixin, moesin) protein family, both of them participate in cell adhesion, morphogenesis and motility by regulating the cross linker between plasma membrane and actin cytoskeleton. Ezrin and radixin are localized in the growth cones of cultured neurons and in astrocytes. However, the detail of spatiotemporal expression of ERM family proteins in the central nervous system is not yet well understood. In this study, the expression of ezrin and radixin were studied using double-immunohistochemical technique in the developing cerebral cortex and hippocampal formation of mouse. Although both ezrin and radixin were expressed in the proliferative zone of embryonic cortical wall and hippocampal formation, they showed different spatiotemporal expression patterns. During early embryonic development, radixin began to be expressed in the cortical ventricular zone and preplate at embryonic day (E)12, while ezrin was selectively expressed in the presumptive cortical hem adjacent to the hippocampal primordium at E12. During the late embryonic stages (E16-E18), both ezrin and radixin were localized in beta III tubulin-positive neurons in the cortical intermediate zone and subventricular zone. At birth (postnatal day 0; P0), expression of ezrin and radixin decreased in the superficial cortical layers, while the expression of both proteins were relatively high within the cortical white matter and subventricular zone. From P3 to P8, ezrin and radixin were localized in the two different populations of cells; glial fibrillary acid protein (GFAP)-positive glia in the white matter and the beta III tubulin-positive neurons in the anterior part of subventricular zone, while radixin expression was still high within the white matter. In the developing dentate gyrus, ezrin and radixin were abundantly expressed in the dentate migratory stream, where newborn granule cells were migrating into dentate anlage. During early postnatal ages (P3-P8), ezrin and radixin were mainly localized in the dentate hilus, where they were partially co-localized within beta III tubulin in subpopulations of neurons. By P14, both ezrin and radixin were expressed only in the subgranular zone along the hilar side of dentate granule cell layer. Taken together, these data suggest the possibility that ezrin and radixin may play important roles in neurogenesis, neuronal migration and gliogenesis during development of mouse forebrain.