

Joint event on
8th International Conference on
**NEUROLOGICAL DISORDERS,
CENTRAL NERVOUS SYSTEM AND STROKE**
&
International Conference on
NEUROLOGY AND NEUROSURGERY

December 04-05, Dubai, UAE

Alteration of extracellular matrix molecules in the developing mouse Brainstem**András Birinyi**

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Several studies have demonstrated that molecular and structural composition of the Extracellular Matrix (ECM) in the central nervous system undergoes profound transformation during embryonic and early postnatal development. The aim of this study was to detect the changes of staining pattern of different ECM molecules in the developing mouse brainstem by using histochemical Wisteria Floribunda Agglutinin (WFA), Hyaluronic Acid Probe (HA) and immunohistochemical (aggrecan, neurocan, versican (GAG beta), TN-R and HAPLN1) methods.


We found that HA, neurocan and versican reactions showed diffuse neuropil staining at very early embryonic stage (E13.5), but the Perineuronal Net (PNN) composed of these molecules were observed only postnatally (P7). We could not find any aggrecan, WFA or HAPLN1 staining before birth. Postnatally WFA and aggrecan established PNN in the reticular formation and in the vestibular and other brainstem nuclei. Postnatally WFA, aggrecan and HAPLN1 were restricted to the neuropil of some brainstem nuclei, in contrast to HA, neurocan and TN-R which were found throughout the brainstem.

Our results show that at early stages of development only a diffuse staining of ECM molecules is present in the neuropil of the brainstem. The formation of a definitive PNN is recognizable postnatally and fully developed in two weeks old animals. We detected spatiotemporal differences in the distribution of different ECM molecules both in the neuropil and perineuronal net in various brainstem areas. The pattern of ECM expression appears to be related to the functional maturation of brainstem neural circuits, including developmental processes such as neurogenesis, synaptogenesis or synaptic plasticity.

Biography

András Birinyi gives lectures, seminars and practices in gross anatomy, histology and embryology to medical and dentist students, pharmacists, as well as physiotherapists. His scientific activities are related to the field of quantitative morphology and neurochemistry by using intracellular and fluorescent labelling of neurons and investigating them with light, confocal and electron microscope. He studied the morphology of motor related neuronal circuits in the spinal cord and brainstem of different amphibian and mammalian species.

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