ЖУРНАЛ ЭВОЛЮЦИОННОЙ БИОХИМИИ И ФИЗИОЛОГИИ, 2020, том 56, № 7, с. 794

МАТЕРИАЛЫ КОНФЕРЕНЦИИ И ШКОЛЫ

EVOLUTION OF AMPHIBIAN EMBRYONIC BRAIN MORPHOGENESIS

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DOI: 10.31857/S0044452920072450

For studies of morphogenesis, the nervous system seems to be the most attractive object. The shape of the brain evolved as a result of complex morphogenetic processes that are necessary for the distribution of structural genes activity over time and space. From this point of view, the shape of the brain is a kind of artifact of the adaptive evolution of organisms. In order to evaluate the main trends in the evolution of amphibian brain ontogenesis, one should compare the early stages of development of various types of amphibians from the appearance of the first progenitor cells to primary neurodifferentiation. There are at least two views on the processes of determining the development of the nervous system: ideas about the mosaic and regulatory development of the nervous system. The mosaic type of development provides for the determination of the fate of the descendants of progenitor cells throughout the entire ontogenesis of the brain, up to its final differentiation. The regulatory model of the development of the nervous system considers significantly less programming the fate of individual cells. The basis of the regulatory model for brain development is the multifunctionality of progenitor cells and the absence of a rigid embryonic development program. An embryological analysis of the processes of early formation of the nervous system in various species of urodelous and anuran amphibians was carried out. The features and mechanisms of intercellular interactions leading to changes in the spatial organization and primary differentiation of the brain were studied. Interspecific differences were established in the organization of neuroepithelium, neurulation and segmentation of the central nervous system. The data obtained suggest that the reason for the similarity of brain development is not the common origin of specific species, but the presence of universal mechanisms of morphogenesis. The hypothesis suggests that the similarity of the shape of the developing brain is determined by the coding mechanisms of positional information necessary for histogenetic differentiation.