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МАТЕРИАЛЫ КОНФЕРЕНЦИИ И ШКОЛЫ

HEARING DEVELOPMENT IN ONTO- AND PHYLOGENESIS: THE ROLE OF EVOLVING ENDOTHERMY

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Hearing most clearly demonstrates the evolution of sensory systems of vertebrates. Fishes have successfully adapted various formations such as the air bubble and the Weber apparatus to amplify sound, use some maculae of the vestibular system as hearing receptor organs, and develop specific auditory pathways in the central nervous system, the pattern of which is similar to that of terrestrial vertebrates. Mastering land required the development of the middle ear, auditory ossicles, and tympanic membrane. Amphibians have two specialized auditory papillae, one of them – *papilla basilaris* in numerous variations is preserved in further evolution. Morphologically auditory cochlea is similar in crocodiles, birds and Monotremata. In Monotremata *papilla basilaris* shows mammalian structure organisation, but if the bundles of stereocilia of the inner hair cells are similar to that of mammals, the outer hair cells are the same as in birds. Perfection of hearing occurs in birds and mammals with the acquisition of endothermy. Hearing of endothermic animals is characterized by increased sensitivity, processing speed of auditory signals, expansion of the range of perceived frequencies, and occurs in parallel with the complication of acoustic communication. Despite the fact that birds have a simpler *papilla basilaris* compared to the Euteria Corti organ, higher thresholds and a hearing range of up to 20 kHz, their auditory system, especially in Passeriformes with a high body temperature, is capable of finer analysis of acoustic signals. Achieving true endothermy, both in evolution and in ontogenesis, makes it possible to perceive higher frequencies, imprinting the time-frequency and frequency-amplitude modulations of the signal. The ascending auditory canals are built on a single principle up to the diencephalon with the necessary complications as the hearing evolves. The auditory parts of mammalian forebrain, due to the formation of the cortex, differ morphologically, but not functionally, from the auditory structures of the forebrain in birds and reptiles, which preserve the main developmental pattern of vertebrate.

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