



# **Development of the Auditory Brainstem in Bullfrogs: Structural and Molecular Histogenesis of the Superior Olive and Lateral Lemniscus and Parallels with Human Auditory Development**

*Thomas Templin*

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The frog superior olive (SO) is a putative homolog of the medial superior olive of mammals and the laminar nucleus of birds. Studying the maturation of the SO is valuable because of the extensive plasticity demonstrated by the nuclei of the mammalian superior olivary complex and the similarities between the developmental trajectories of anurans and auditorily precocial mammals (such as humans), including the shift from aquatic to atmospheric sound environments. A series of histomorphometric and histochemical studies was conducted to quantitate developmental changes in the bullfrog SO and lateral lemniscus (LL) across metamorphosis. The studies made use of modern stereological tools (optical fractionator, planimetry) and investigated the expression levels of the growth and plasticity associated protein (GAP)-43 in the developing SO and LL. The studies described in this book contribute to the understanding of anuran auditory-brainstem development and could be of interest to herpetologists, comparative biologists, and developmental or structural neuroscientists, as well as anybody else with an interest in quantitative neurobiology or amphibian or auditory-system development.

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