

# Opioid receptor gene expression in the inner ear of early postnatal rats.

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The spatial and temporal expression patterns of mu, delta and kappa opioid receptor mRNAs are distinct at all ages. Several data also support the hypothesis that endogenous opioid modulation of brain development is a fundamental principle of mammalian embryogenesis. Three types of opioid receptors have been identified in the mammalian cochlea by our group. In this present study we examine the expression of mu, delta and kappa opioid receptor subtypes in postnatal rat cochlea. The expression of these opioid receptor subtypes has been determined by reverse transcriptase–polymerase chain reaction (RT–PCR) followed by nested–PCR analysis. Total RNA was extracted from cochlear tissues and cerebral cortex of postnatal Sprague–Dawley rats (P0, P4, P8 and P16). RT–PCR analysis was performed with primers specific for the nucleotide sequences representing mu, delta

and kappa opioid receptor subtypes. Amplification of RNA from rat cerebral cortex (positive control) and rat cochlea tissues with MOR, DOR and KOR primers resulted in products of the predicted lengths, 564, 356, and 276 bp, respectively. Negative controls included reactions in which either RNA or the enzyme reverse transcriptase were omitted. The results indicate that all three opioid receptor subtypes are expressed in all postnatal rats as early as postnatal day 0. The present data provide further evidence of the role of opioid receptors in the development of the auditory system.

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