# Activin Signaling Disruption in the Cochlea Does Not Influence Hearing in Adult Mice

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**Author(s)** Horvath, Lukas; Bodmer, Daniel; Radojevic, Vesna; Monge Naldi, Arianne
**Author(s) at UniBasel** Bodmer, Daniel ;
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Activin, a member of the TGF-F superfamily, was found to play an important role in the development, repair and apoptosis of different tissues and organs. Accordingly, activin signaling is involved in the development of the cochlea. Activin binds to its receptor ActRII, then dimerizes with ActRI and induces a signaling pathway resulting in gene expression. A study reported a case of fibrodysplasia ossificans progressiva with an unusual mutation in the ActRI gene leading to sensorineural hearing loss. This draws attention to the role of activin and its receptors in the developed cochlea. To date, only the expression of ActRII is known in the adult mammalian cochlea. In this study, we present for the first time the presence of activin A and ActRIB in the adult cochlea. Transgenic mice with postnatal dominant-negative ActRIB expression causing disruption of activin signaling in vivo were used for assessing cochlear morphology and hearing ability through the auditory brainstem response (ABR) threshold. Nonfunctioning ActRIB did not affect the ABR thresholds and did not alter the microscopic anatomy of the cochlea. We conclude, therefore, that activin signaling is not necessary for hearing in adult mice under physiological conditions but may be important during and after damaging events in the inner ear.

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