

Auditory cortex basal activity modulates cochlear responses in chinchillas

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Background: The auditory efferent system has unique neuroanatomical pathways that connect the cerebral cortex with sensory receptor cells. Pyramidal neurons located in layers V and VI of the primary auditory cortex constitute descending projections to the thalamus, inferior colliculus, and even directly to the superior olivary complex and to the cochlear nucleus. Efferent pathways are connected to the cochlear receptor by the olivocochlear system, which innervates outer hair cells and auditory nerve fibers. The functional role of the cortico-olivocochlear efferent system remains debated. We hypothesized that auditory cortex basal activity modulates cochlear and auditory-nerve afferent responses through the efferent system. **Methodology/Principal Findings:** Cochlear microphonics (CM), auditory-nerve compound action potentials (CAP) and auditory cortex evoked potentials (ACEP) were recorded in twenty anesthetized chinchillas, before, during and after auditory cortex deactivation by two met