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# New Therapies to Prevent or Cure Auditory Disorders

- Analyzes new molecular therapies that prevent specific pathologies of the ear like age related and noise-induced hearing loss
- Provides a review of hair cell regeneration and identifies potential targets for new therapies
- Describes the significant advances in animal models that reveal underlying mechanisms and treatment for tinnitus and hyperacusis

Hearing loss is the most common form of sensory impairment in humans, affecting 360 million persons worldwide. In parallel, tinnitus disorder, the perception of a phantom sound often described as a ringing or buzzing, affects around 10–15% of the general population and interferes with daily life. Hyperacusis, defined as a hypersensitivity to moderate-intensity sounds often co-occurs with tinnitus suggesting a common mechanism of dysfunction for these two perceptual disorders. Whereas some drug candidates are in the process of being developed, nowadays no effective treatment exists to cure hearing loss and tinnitus. The topic of this book was selected with the goal of emphasizing mechanisms that induce hearing loss and tinnitus which lead the selection of promising targets for hearing disorder treatment. Hair cells (HC) are the sensory cells of the inner ear required for both auditory and vestibular functions in all vertebrates. HC are progressively lost during ageing and they are in addition sensitive to physical and acoustic traumas, infectious diseases and chemicals present in commonly used treatments such as anticancer, antimalarial or antibiotics. As adult mammals—including humans—cannot regenerate dead HC, all the possible injury could result in irreversible and permanent hearing loss. It has been shown, however, that a limited capacity to regenerate HC exists in mouse at an early stage of development.

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