Medical Xpress

Sound preconditioning prevents ototoxic drug-induced hearing loss in mice

October 15 2013

The death of sensory hair cells in the ear results in irreversible hearing loss. Several classes of drugs, including aminoglycoside antibiotics and chemotherapy drugs are known to kill hair cells; however, in many cases the benefit of using the drug outweighs the potential for hearing loss. Previous research has shown that a class of proteins induced in response to cell stress, the heat shock proteins (HSPs), can protect against sensory hair cell death in response to ototoxic drugs. Despite understanding how HSPs protect the hair cells of the inner ear, there are no current therapies to induce expression of or deliver HSP directly to the inner ear.

In this issue of the *Journal of Clinical Investigation*, Lisa Cunningham and colleagues at the National Institutes of Health developed a sound preconditioning protocol in mice that did not damage hearing, but induced HSP expression in the ear. They found that sound conditioning prior to treatment with ototoxic drugs, protected mice from drug-induced hearing loss. Furthermore, sound preconditioning resulted in increased expression of HSPs in the inner ear.

Together, these data indicate that sound therapy may protect hearing in patients that require treatment with ototoxic drugs.

More information: Sound preconditioning therapy inhibits ototoxic hearing loss in mice, *J Clin Invest*. DOI: 10.1172/JCI71353