
FrontEar – Clinical Translation of Optogenetic Gene Therapy for Hearing Restoration

Prof. Dr. Tobias Moser

*Institute for Auditory Neuroscience
Georg-August-Universität Göttingen*

Cochlear implants (CI) help many people with severe hearing loss or deafness, but they have fundamental limitations. The electrical stimulation of the cochlea by the CI spreads very widely, reducing sound clarity and emotional speech comprehension and limiting speech comprehension in noisy environments. Enjoying music is often impossible. The FrontEar project is developing a new therapeutic approach that combines gene therapy with optical stimulation. This promises a more precise hearing sensation that is closer to natural hearing. The method uses AAV-based gene therapy to make the auditory nerve cells sensitive to light.

A specially developed optical cochlear implant (oCI) transmits targeted light pulses to activate these cells. This enables a highly precise optical activation of the auditory nerve, which is much more similar to the activation in natural hearing than is possible with today's CIs. The scientists will produce a GMP-qualifiable gene therapy and conduct safety and efficacy studies in animals. The results are used to apply for approval for an initial clinical trial in humans in Germany.
