

## **Local application of lidocaine using biodegradable polymers for attenuation of tinnitus**

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The aim of this project is to establish the basis for clinical application of local lidocaine application using biodegradable polymers for attenuation of tinnitus. In this project, we examined the efficiency of several biodegradable polymers for sustained delivery of lidocaine into the cochlear perilymph. This project is composed of two investigations, in vitro analysis of lidocaine-release profiles and in vivo experiments as pre-clinical examinations.

We make several types of biodegradable polymers, which are included synthetic and natural materials, containing lidocaine, and examine their release profiles in vitro as screening. We select 3-4 biodegradable polymers according to the results of in vitro analysis, and examine their potential for sustained release of lidocaine into the cochlear fluid, effects on inner ear functions and risks for unwanted effects following application of lidocaine-containing polymers onto the round window membrane. Based on the results of in vivo analyses, we determine the biodegradable polymer for clinical examination. Finally, we perform several examinations including analysis of serum levels of lidocaine and effects on cardiac function to confirm the safety of our proposed method.

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