# Department of Ear, Nose and Throat Diseases, Head and Neck Surgery

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The Department comprises several highly specialized units. It focuses on diagnosing and treating diseases in its field and is intensively involved in research projects that allow these diseases to be better understood and treated. Experts in audiology, medicine, physics, and engineering conduct practice-oriented research.

## Robotic Precision in Cochlear Implantation

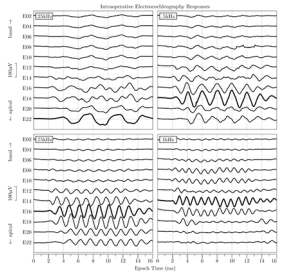
Robotic assistance offers a precise solution for cochlear implant placement near the delicate inner ear structures. Our work focuses on developing and validating a force-measuring insertion tool that delivers high-resolution, real-time feedback. Additionally, we conduct quantitative evaluations of clinically available tools to assess their benefits and limitations, guiding their optimal use in practice.

Aebischer et al., Int J Comput Assist Radiol Surg. 2024

Aebischer et al, IEEE Trans Biomed Eng. 2024

## Electrocochleography in Cochlear Implant Recipients: Correlating Maximum Response With Residual Hearing

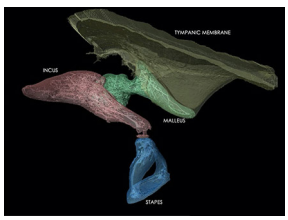
This study aimed to objectively determine intraoperative cochlear microphonic (CM) amplitude patterns and correlate them with residual hearing in cochlear implant recipients. We found a statistically significant negative correlation between maximum CM amplitudes and preoperative hearing thresholds. We could enhance the understanding of cochlear health and overcome the obstacles of current ECochG analysis.



Andonie et al., Ear Hear. 2024

## Dynamic X-ray Microtomography vs. Laser-Doppler Vibrometry: A Comparative Study

There are challenges in understanding the biomechanics of the human middle ear, and established methods show limitations. We evaluated a novel dynamic imaging technique based on synchrotron X-ray microtomography by comparing it to laser-Doppler vibrometry. Our results demonstrate the suitability of dynamic synchrotron-based X-ray microtomography in studying the middle ear's biomechanics.




Ivanovic et al., Res Sq [Preprint]. 2024