Technical University
of Denmark

Popular science summary of the PhD thesis

PhD student	Gerard Encina-Llamas
Title of the PhD thesis	Characterizing cochlear hearing impairment using advanced electrophysiological methods
PhD school/Department	Hearing Systems group – Department of Electrical Engineering

Science summary

* Please give a short popular abstract in either Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof:

One of the impressive and not fully understood abilities of the healthy ear is the property of enabling successful communication in situations with high levels of background noise, e.g. in noisy restaurants or in bars. In order to do so, the complex biological machinery in the ear must function with precision to transform the sound into a type of information that the brain can understand. The cells responsible for doing this transformation can die, and this leads to hearing impairment. To compensate for this impairment, ear doctors (i.e. otolaryngologists) often prescribe the use of hearing aids. However, with the current diagnostic methods it is not possible to assess all the details of the hearing deficits, and this leads to inaccurate hearing aid fittings. Therefore, novel diagnostic methods capable of detecting all the tiny dysfunctions that today remain hidden are needed. This PhD project investigated the use of advanced electrophysiological methods to measure how the brain responds when it is stimulated with loud sounds. By comparing those brain responses recorded in humans and mice with simulated results from computer models, potential new techniques for distinguishing different subtle types of hearing loss were developed.

Please email the abstract to the PhD secretary at the department

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