

Projekttitlel: OPRA – Ear prothesis coupling structure
Partner: SurgitAix AG, Spiggle & Theis Medizintechnik GmbH,
ITA GmbH, Clinic for ENT-medicine und plastic head
and neck surgery at RWTH Aachen
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Mission Statement

Annually a surgery is performed on 25.000 patients suffering from an ossicle destructing middle ear infection in Germany. The destruction of the ossicles in the middle ear lead to deafness. In order to restore the capability of hearing partial (PORP) or total (TORP) ossicle replacement prothesis are implanted into the middle ear. In about 7.000 cases a second surgery has to be performed because the prostheses have failed. The failure of the prostheses has several reasons. For example slipping of the implant short- or medium-term after the surgery or kinking of the implant through scar formation. Aim of the research project was to develop a textile based structure to facilitate the coupling of the prostheses and the ear drum tissue. Furthermore the textile should stabilize the prostheses directly after the implantation.

Approach:

Because of the small room in the middle ear and the high requirements regarding biocompatibility and slip-resistance electrospun nonwoven are used in this project. Different materials (PCL, PLGA and PMMA) and different structural compositions of the nonwoven were investigated regarding their adhesion, sound transmission and cell material interaction. The results of the project showed that a mixture of PLGA and PMMA fibres show a porosity which favors a cell migration into the nonwoven.

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