

Small Textile – Huge Effect

DITF and NEOS decorated with the EUREKA Innovation Award

MADRID: Herniated vertebral discs are usually very painful and difficult to cure. A new implant, drafted by the Spanish company NEOS Surgery and developed together with DITF Denkendorf, follows a new concept to close the fracture in the disc from inside with an 'umbrella'. For this novel medical device NEOS and DITF received on June 30th, 2017 the EUREKA Innovation Award in the category "Innovators of Tomorrow".

In Germany alone it hits 120,000 patients every year: a fracture in the outer shell of the vertebral disc results in an herniation. Due to biomechanical stress to the spinal column, the outer ring of the disc (annulus) brakes and the jellylike core (nucleus) escapes through the fracture and squeezes the bypassing nerves which is very painful. Thus the disc can no longer function as damper.

Up to now the vertebral disc cannot be repaired and the fracture also doesn't heal itself. Often the disc will no longer be preserved and the neighboring vertebrae are allowed to fuse which causes an even higher reduction in mobility and additional stress for the neighboring discs.

The company NEOS Surgery S.L. in Barcelona (Spain) had drafted the interesting idea to close the fracture from inside and therefor contacted DITF in 2010 to develop a textile 'umbrella'. In a mutual European project DITF provided a flexible textile closure device, which can be opened inside the nucleus of the disc. More than 20 design variations were developed and had to be tested until one was found to be suitable. The textile know-how at DITF was needed to select the right yarn and a suitable weaving technique

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to produce the small and very dense device of only 10 cm² with the necessary fixation elements.

In long series of tests with spinal columns from pathology the functionality of the closure device under typical movements could be proven. NEOS is planning a first clinical trial end of 2017 and the commercial launch for 2019. Because DITF – unique for a research institute – hold their own approved medical device company, prototypes for this study can be produced there. Upon success ITV Denkendorf Produktservice GmbH will also continue to produce the textile part of the implant.

The German part of the project "Research and Development of a Textile-Based Annulus Repair Device (ArTex)" was financed in the frame of the EUROSTARS-program through the Federal Ministry of Education and Research. The concept and the vision thereof have also impressed the EUREKA network: on June 30th, 2017 the project was decorated at the Ministerial conference of the 40 EUREKA member states in Madrid with the Innovation Award in the category "Innovators of Tomorrow".

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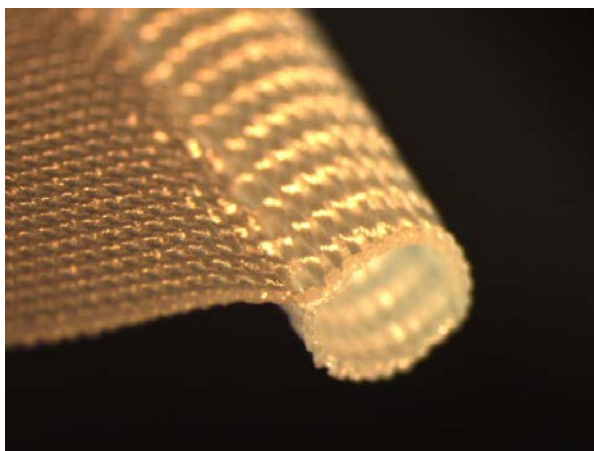
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The NEOS staff together with Professor Doser (DITF) at the award ceremony in Madrid (photo: CDTI)



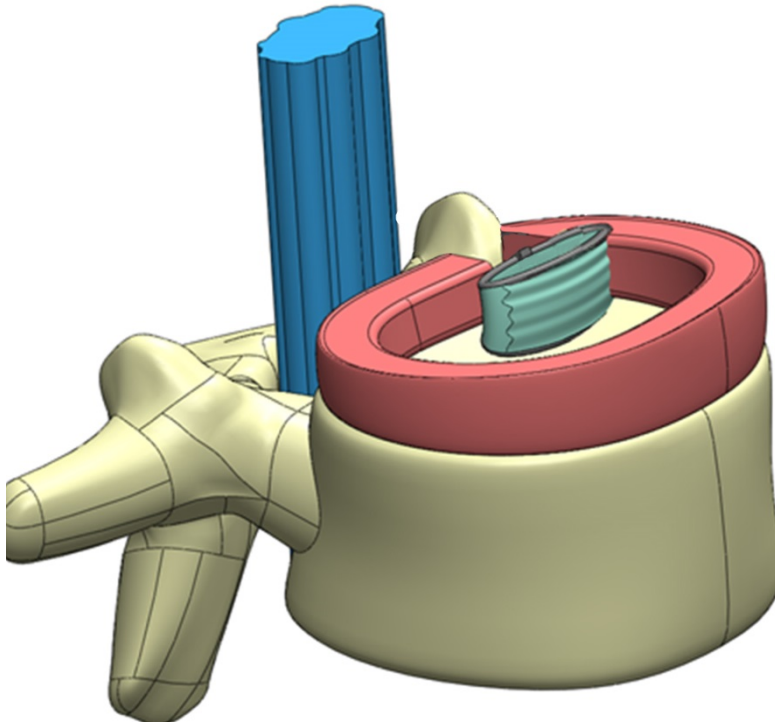
Woven closure device for herniated discs with mounting element (photo: DITF)

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Schematic view of the closure device inside the intervertebral disc (picture: NEOS)



Project meeting of the developer teams in the weaving department at DITF (photo: DITF)