Univ.-Prof.
Prof. h.c. (Moscow State Univ.)
Dr.-Ing. Dipl.-Wirt. Ing.
Thomas Gries
Director

Klas-Moritz Kossel
Head of Research Group
Medical Fibre Systems

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Project title:	Investigation on the interrelationships of textile parameters of thread production for the reduction of bacterial adhesion („ResistantMesh“)
Partner:	FEG Textiltechnik mbH Klinik für Allgemein-, Viszeral- und Transplantationschirurgie der Uniklinik Aachen Institut für Medizinische Mikrobiologie der Uniklinik Aachen
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Mission Statement

Every year, more than 1.5 million textile implants are successfully used worldwide, in particular for the treatment of hernias (hernia meshes). These can also lead to complications years later due to implant infections. This is caused by bacteria adhering to the mesh surface, which manifest an infection spontaneously or even years after implantation. Previous implant strategies to reduce infections have been based on the use of antimicrobial coatings. Due to the very cost-intensive and lengthy approval process as a combination product, such implants have a very high price level. Furthermore, the efficacy and safety of mesh implants with antibacterial agents are controversially discussed and the increase of resistance is omnipresent. Therefore, cost-effective textile solutions have to be developed that both counteract increased bacterial contamination and lower the approval barriers. In the literature, effects related to bacterial adhesion are described which can be attributed to textile properties such as thread geometry and surface and structural parameters such as effective porosity and effective mesh surface. The influence of these material-, filament- and structure-specific properties on bacterial adhesion has not yet been sufficiently investigated. The ResistantMesh project follows a new innovative approach based on the modification of the textile structure to reduce the bacterial adhesion of mesh implants. The influence of the mesh structure on the risk of infection has been demonstrated by numerous preclinical data, but the previous approaches to implant optimization are very poor.

Approach

However, suitable evaluation methods and the development of correlations between the individual parameters and bacterial adherence are lacking. Within the scope of this project, a specific variation of influencing parameters in filament production will be carried out. This includes, among other things, the starting material and the spinning process.

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Contact

Klas-Moritz Kossel, M.Sc.
Institut fuer Textiltechnik der RWTH Aachen
Tel.: +49 (0) 241 80 24731
E-Mail: klas.kossel@ita.rwth-aachen.de