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

**Klas-Moritz Kossel**
Gruppenleiter
Medizinische Fasersysteme

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| **Project title:** | Investigation of textile parameters influencing bacterial adherence and growth in medical textiles to reduce hospital infections („BakTex“) |
| **Partner:** | Hohenstein Institut für Textilinnovation gGmbH |
| **Duration:** | 01/2017 – 04/2019 |
| **Funding:** | AiF - IGF |

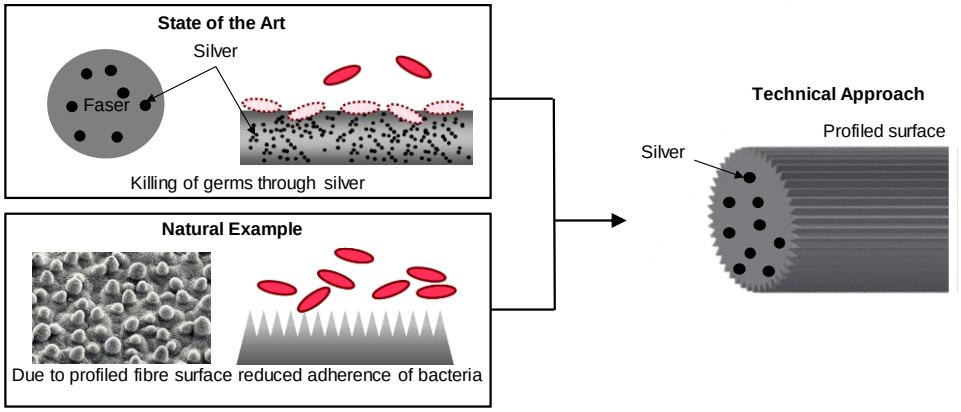
## Mission Statement

Healthcare associated infections are a major socio-economic problem worldwide. In Germany alone, the additional costs for the treatment amount to approximately 1.3 billion euros per year. In Europe, approximately 4.1 million people suffer from hospital germs every year, and about 110,000 people die from them. Textiles play an important role in hospital hygiene because they are in direct contact with patients and hospital staff and thus represent a potential risk of transmission and infection. Antimicrobial textiles can therefore be used advantageously for the purpose of infection prophylaxis. In the BakTex project, the fibre structure was specifically modified by adapting melt spinning parameters in order to reduce the required amount of biocide. The aim was to achieve a maximum antimicrobial effect by combining the fibre structure with the smallest possible amount of antimicrobial fibre doping.

## Results

Within the scope of the project, suitable spinneret geometries for the production of strongly profiled fibres were identified and corresponding melt spinning process settings for the enhancement of the fibre profiling were selected. Here, for example, the spinning head temperature had a significant influence on the fibre shaping. An increase of the extrusion temperature, however, caused a reduction of the profile spacing, a reduction of the temperature increased the shaping. The resulting shaping of the fibres could be quantified using form factors. Furthermore, the doping of the profile fibres with 0.1 to 0.3 wt-% nanosilver was possible. It was possible to successfully produce textiles in the form of knitted fabrics from the shaped fibres with and without silver doping. The microbiological analyses of the fibres showed that the structured shape alone could not cause bacteria to adhere less strongly to their surface. However, it could be shown that bacterial adherence and antimicrobial efficacy complemented each other in the case of the structured

silver-doped snowflake fibres. While the adhesion of small bacterial species increased due to the profiling of the fibres, the antimicrobial effectiveness increased overall due to the enlargement of the reactive surface. Even with finer fibres, the influence of an enlarged surface showed a positive effect on the germicidal effect.

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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

Wirt.-Ing. Frederik Cloppenburg, M.Sc.
Institut fuer Textiltechnik der RWTH Aachen
Tel.: +49 (0) 241 80-24714
E-Mail: frederik.cloppenburg@ita.rwth-aachen.de

Dr. Marina Handel
Hohenstein Institut für Textilinnovation gGmbH
Tel.: +49 (0) 7143 271 427
E-Mail: M.Handel@hohenstein.de