



Press Release

Project start: New active substance targeting dreaded hospital germs

Microbiologist Professor Andreas Peschel prepares substance for clinical testing

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In the German Center for Infection Research (DZIF), scientists from the universities of Tübingen, Münster and Munich join forces and prepare together with the company Hyglos clinical studies on an active substance against the dreaded hospital pathogen *Staphylococcus aureus*: A highly effective protein from bacteria-specific viruses, so-called bacteriophages, shall rapidly kill the bacteria, which frequently occur in the nose. Due to the specific action, the natural microflora is maintained. Such prophylactic treatment of nasal colonization could counteract the spread of especially methicillin-resistant *staphylococcus aureus* (MRSA) in hospitals and thereby prevent infections in patients.

Every third person, according to expert estimates, carries the bacterium *Staphylococcus aureus* in their nose - which is not dangerous in the case of healthy individuals, however quickly becomes a problem if the carrier is admitted to a hospital. This since the pathogen can enter for example into wounds in connection with surgery and potentially cause dangerous infections. In addition there is a large risk of spread of the pathogen as a hospital bug. Especially feared are methicillin-resistant *Staphylococcus aureus* isolates, abbreviated MRSA, because of their resistance to many of the commonly used antibiotics.

"A rapid detection and effective elimination of MRSA colonization in the nose prior to a hospital stay is a crucial step in combating these hospital germs", so the conviction of Prof. Dr. Karsten Becker at the University Hospital Münster. The bacteria in the nose are increasingly resistant to the currently used antibiotic mupirocin and the duration of the decolonization and follow-up control is around one week. Under such circumstances, no effective MRSA prevention is possible for patients immediately in need of surgery.

Together with the Hyglos GmbH in Bernried and with support from the BMBF, scientists at the University Hospital Münster have developed a specific active substance in recent years and studied its effect: A phage lytic enzyme that is a protein from viruses that infect bacteria, specifically attacks *Staphylococcus aureus* cells and dissolve them. The protein was synthetically produced and optimized as a "designer protein" with the working name HY-133. "We do like to describe it as a MRSA-killing protein, even if it sounds somewhat sensational," explains Dr. Wolfgang Mutter from Hyglos GmbH. In fact, all *Staphylococcus aureus* cells, whether resistant or not resistant, will be killed by this new active substance within a very short time. And this without the natural microflora in the nose being destroyed nor does resistance develop.

In cooperation with the microbiologist Prof. Dr. Andreas Peschel (University of Tübingen), who coordinates the DZIF research on "Healthcare-associated and antibiotic-resistant infections", the active substance will now be prepared for clinical testing.

More than 1.5 million euros will be provided for HY-133 development within the DZIF: The substance will first be manufactured under GMP guidelines (manufacturing practice according to pharmaceutical standards) and subsequently be tested for preclinical toxicology. The pharmacist Prof. Dr. Gerhard Winter at the LMU Munich will develop a stable formulation, so that the substance may be conveniently and safely administered as a gel or in any other form to the patient.

The project will be conducted in view of subsequent clinical trials, in which the rapid decolonization of *Staphylococcus aureus* strains will be studied in the nasal flora of volunteers. "In addition to new antibiotics and vaccines we urgently need specific agents for decolonization of problematic germs. The HY-133 protein is a highly innovative active substance for this purpose, which could lead to many similar development programs", Prof. Dr. Andreas Peschel adds.

That the fight against resistant hospital germs is taken very seriously at the political level, is reflected in the coming week: At the G7 summit in Elmau the topic antibiotic resistance is on the agenda.

In case you need any pictures, please contact: karolina.heed@hyglos.de

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At the **German Center for Infection Research (DZIF)** nationwide around 300 scientists from 32 institutions jointly develop new approaches for prevention, diagnosis and treatment of infectious

diseases. One of the focal points is the research on hospital germs and antibiotic-resistant bacteria. The DZIF is funded by the BMBF. More information on www.dzif.de.

University of Tübingen – Infectious Diseases and Microbiology form a major focus of research at the University of Tübingen, especially in the Interfaculty Institute for Microbiology and Infection Medicine (IMIT). The study of staphylococci, bacteria that often develop resistance to antibiotics and cause infections in the hospital, is a particular focus of the IMIT researchers. www.uni-tuebingen.de

University Hospital Münster (UKM) represents cutting-edge medicine in the German hospital landscape as well as research at the highest international level. Important research priorities of the UKM Institute of Medical Microbiology are staphylococci - pathogens and infections - as well as diagnostics, typing, characterization and susceptibility testing of microorganisms. www.klinikum.uni-muenster.de

Ludwig Maximilian University of Munich (LMU), Department of Pharmacy - The development of stable formulations for protein drugs and the administration of new biotech drugs in sustained release forms or their local application are key research areas in Pharmaceutical Technology at the LMU. Only with appropriate forms of preparation it will be possible in the end, to successfully apply sensitive substances such as the new phage lytic enzyme. www.uni-muenchen.de

Hyglos GmbH is a biotechnology company based in the Biotechnology Center Bernried south of Munich. With its proprietary technology the Hyglos scientists develop highly specific bacteriophage-based agents for the detection and elimination of harmful bacteria and bacterial toxins. Hyglos is an IAFP Innovation awardee for such technological advances. www.hyglos.com
