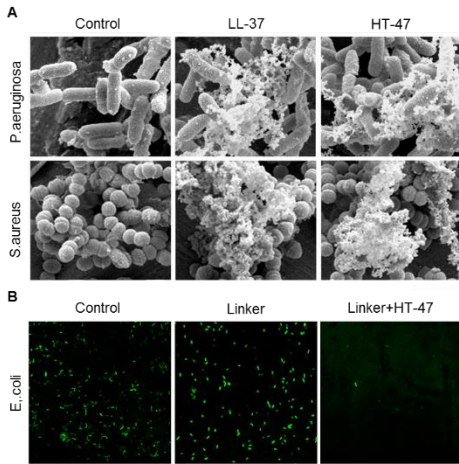


Preventing prostheses- and dental implant-associated infection using antimicrobial peptides of cartilage-specific CLEC3A

Invention

Bacterial infection is one of the most frequent complications in joint replacement and dental implant surgery. The incidence of septic arthritis following total joint arthroplasty is approximately 2%, leading to massive health problems and considerable cost to the national economy. Dental implant inflammation is another frequent condition with serious oral health and economic consequences. A new approach to reduce such infections is antimicrobial coating of prostheses and implants. Major drawbacks of such an approach are that peptides and other substances from exogenous sources are often cytotoxic and may cause an activation of the immune response. Researchers of the Medical Faculty of the University of Cologne have demonstrated that peptides of the cartilage-specific CLEC3A kill both Gram-positive and Gram-negative nosocomial bacteria (Figure A). Furthermore, coating these antimicrobial peptides on titanium substrates significantly reduces bacterial adhesion on titanium substrates (Figure B). Coating of prostheses and dental implants with CLEC3A-derived antimicrobial peptides could therefore be an effective way of preventing infection without cytotoxicity and immunogenicity issues.



A: Killing of various Gram-negative and Gram-positive nosocomial bacteria by the CLEC3A-derived peptide HT-47. Negative control: buffer only, positive control: reference antimicrobial peptide LL-37.

B: Coating titanium substrates with HT-47 (using a linker) significantly reduces bacterial adhesion

Commercial Opportunities

The invention is offered for licensing and further development in collaboration with the researchers.

Current Status

The researchers have shown that even high concentrations of CLEC3A-derived peptides show no cytotoxicity against primary human chondrocytes. In case of interest we will be pleased to inform you about the patent status. In case of interest we will be pleased to inform you about the patent status.

Relevant Publications

Manuscript in preparation.

An invention from the University of Cologne.

Advantages

- Potent antibiotic activity against both Gram-positive and Gram-negative nosocomial bacteria
- No immunogenicity due to the protein's natural expression in cartilage
- No cytotoxicity against human cells
- Suitable for surface coating of prostheses and dental implants

Technology Readiness Level

1 2 3 4 5 6 7 8 9

Experimental proof of concept

Sector(s)

- Medical Technology

Ref.-No.

5125



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