

Inspired by Nature: SMAMPs

For non-medical or medical use * Bioactive, polycationic synthetic mimics of antimicrobial peptides fight bacteria in solution * Their polyzwitterionic derivatives provide simultaneous antimicrobial activity and resistance to biofilm formation on surfaces

Technology

Polycationic Synthetic Mimics of Antimicrobial Peptides (SMAMPs) are fast acting, bactericidal polymers that, comparable to natural antimicrobial peptides, can kill many types of bacteria with a high safety window towards human cells. They interact with bacterial membranes upon contact by a bio-physical mechanism (unlike bacteriostatic antibiotics). This causes less bacterial resistance and is thus important in a regulatory context. SMAMPs are also cell compatible. Hence, they are a clear alternative to silver, disinfectants, parabens, triclosan and antibiotics. For solution applications, antibacterial lead structures have been identified, which in minimum inhibitory assays showed high antibacterial activity and no damage to human cells in hemolysis test system. **Amphiphilic polyzwitterions** derived from SMAMPs have demonstrated high antimicrobial activity, cell compatibility and additionally resistance to protein adhesion/biofilm formation as surface-attached polymer networks. They thus enabling surface protection of medical devices (e.g. catheters, implants, etc.).

Application

Polycationic = liquid/semiliquid systems, Polyzwitterionic = surface coatings

- Non-medical technical applications: Coatings of water purification systems, coatings for various water-contacting surfaces prone to biofilm formation, surface coatings in medical settings (ICU)
- Consumer Products: Surface coatings for bacterial protection (band aids) or use in mouth washes, etc.
- Stabilizers/Preservatives: Creams and lotions, replacing parabenes, silver, toxic nano-products, triclosan
- Medical devices classes 1-3: Coating of intrauterine device, catheters, syringes, medical instruments, endoscopes, coating of implants and stents, etc.
- Drugs: disinfectant solutions for eye & ear care, treatment of vaginal and bladder infection; as active ingredient in topical creams for acne, and oral applications for treatment of GI disorders

Developmental Status

- Polycationic SMAMP: In-depth analytical data for prototypes for liquid/semiliquid applications, tech-transfer to GMP compliant production successfully completed, ongoing next generation development of polycationic SMAMPs
- Polyzwitterionic lead SMAMP: In-depth analytical data for prototypes with antimicrobial, cell-compatibility and anti-biofouling activities

Responsible Scientist

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Branch

MedTech

Patent Status

Several patent families in pipeline, granted patents and pending applications

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