Lysostaphin-Delivering Hydrogels to Treat Infections

Technology #7729

A hydrogel developed to treat infections associated with bone fractures and orthopedic device implants

Background: Orthopedic hardware infections are a significant clinical problem with artificial joint replacement surgeries. The most common bacterial infections are caused by Staphylococcal aureus (S. aureus) and current treatments are limited to surgical debridement and systemic antibiotic regimens. Infections almost always lead to implant removal. Lysostaphin enzymes have been shown to have high anti-Staphylococcal activity and thus their use to reduce infection of biomaterials associated with orthopedic implants could have significant health benefits.

Technology: Inventors at Georgia Tech have engineered a lysostaphin-delivering injectable hydrogel to treat S. aureus infections in bone fractures and orthopedic device implantations. The injectable hydrogel conforms and adheres to the fracture and surrounding tissue, ensuring efficient, local delivery of lysostaphin. This injectable hydrogel formulation enhances lysostaphin stability and provides improved efficacy against bacteria growing in biofilms compared to soluble enzymes alone. Lysostaphin-delivering hydrogels effectively eliminate orthopedic S. aureus infections while simultaneously supporting fracture repair.

Potential Commercial Apps:

- Treatment and prevention of S. aureus infections – including antibiotic resistant strains such as Methicillin-resistant Staphylococcus aureus (MRSA)

Benefits/Advantages:

- Alternative to antibiotics – lysostaphin-delivering hydrogels can eliminate the need for systemic drugs
- Reduced number of administrations – localized delivery provides higher dosing at the infection site
- Controlled dosing - Allows for control over the amount and time over which lysostaphin is delivered
- Versatile - Can be administered by injection or surgically

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