Poster abstract submission

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Poster title

Targeted Nasal Eradication of Staphylococcus aureus Using the Recombinant Lytic Agent HY-133: A New Strategy to Address Antimicrobial Resistance

Poster abstract

Staphylococcus aureus, particularly methicillin-resistant strains (MRSA), continues to pose a significant threat in healthcare settings, especially among high-risk patient populations. Conventional decolonization strategies, including mupirocin, are increasingly undermined by rising resistance rates, alternations of the commensal microbiota, and demanding application protocols. These limitations highlight the urgent need for alternative strategies that are rapid, specific, and capable of minimizing resistance development. The recombinant bacteriolytic agent HY-133 has been developed to address this gap. It combines the CHAP domain from the endolysin of bacteriophage K, responsible for enzymatic cleavage of bacterial cell walls, and the cell wall-binding domain of the staphylolytic enzyme lysostaphin. This chimeric design enables highly specific and efficient targeting of S. aureus, while sparing coagulase-negative staphylococci and other commensals of the nasal microbiome.
In vitro evaluation demonstrated that HY-133 exerts rapid and robust bactericidal activity against over 1,000 clinical S. aureus isolates including MRSA spanning more than 100 spa types and different phenotypic variants (1-4). Time-kill studies revealed a pronounced reduction in viable bacterial counts within two hours of exposure (5). These observations were corroborated by in vivo animal model studies, which demonstrated both safety and efficacy of HY-133 upon nasal application. HY-133 has been

manufactured in GMP quality as a stable, application-ready nasal formulation. Its clinical development has advanced to a randomized, double-blind, placebo-controlled phase 1 trial. This first-in-human study evaluates single and multiple dose regimens, assessing safety, tolerability, local effects, and preliminary efficacy. An extended study phase is also investigating its impact on the nasal microbiome.
Owing to its high specificity for S. aureus, rapid bactericidal action and low potential for resistance development, HY-133 represents a compelling candidate for targeted decolonization before hospital admission or surgical procedures. By preserving the resident microbiota, it may also reduce the likelihood of re-colonization and lower the risk of nosocomial infections. The ongoing clinical trial (NCT06290557) is expected to generate essential data on the capacity of HY-133 to reshape S. aureus eradication practices, introducing a novel precision-based approach to infection prevention.

Research topic

Clinical development

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