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Poster abstract submission

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Poster title

GenX-S™: A Non-Antibiotic Therapeutic Targeting Staphylococcal Biofilms in Diabetic Foot Ulcers.

Poster abstract

Diabetic foot ulcers (DFUs) are among the most challenging chronic wounds, driven by persistent Staphylococcal biofilms, impaired microvascularization, and an exaggerated inflammatory environment. Biofilms formed by Staphylococcus aureus and MRSA reduce antibiotic penetration, delay tissue repair, and significantly increase amputation risk. Existing topical therapies—including antimicrobials, silver dressings, and debridement adjuncts—often fail to resolve biofilm-dominated infections, underscoring the need for new non-antibiotic wound-care modalities.

GenX-S™ is a next-generation topical biologic dressing that integrates outer-membrane vesicles (OMVs) with a biocompatible hydrogel to simultaneously target biofilm persistence and promote tissue regeneration. OMVs naturally carry a spectrum of bioactive molecules, and in this platform, they are enriched with VEGF-related pro-angiogenic components that support endothelial activation, granulation tissue formation, and re-epithelialization—processes that are significantly compromised in DFUs.

The hydrogel matrix provides a moisture-balanced, conformable environment and ensures controlled, localized release of therapeutic OMVs at the wound surface. This dual-function system is designed to:
(1) Interfere with staphylococcal biofilm structure, reducing extracellular matrix integrity and facilitating microbial clearance; and
(2) Enhance wound-bed angiogenic signaling, addressing the chronic ischemia and delayed tissue repair characteristic of diabetic ulcers.

In vitro studies demonstrate that OMV-containing hydrogels can reduce S. aureus biofilm biomass while remaining highly cytocompatible in keratinocyte and endothelial cell assays (≥85% viability). Cytokine profiles remain within acceptable ranges, indicating a non-pro-inflammatory response and suitability for topical application.

GenX-S™ represents a novel, non-antibiotic wound-healing platform that unites biofilm-targeting vesicles with angiogenic support in a single dressing. By addressing both microbial and regenerative deficiencies in DFUs, this technology provides a promising avenue for advanced wound care and aligns with global antimicrobial-resistance mitigation strategies.

Research topic

Biological therapeutics

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