# A novel wound matrix containing antimicrobial silver and local anesthetic lidocaine for managing infection risk and pain in burns

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## Introduction

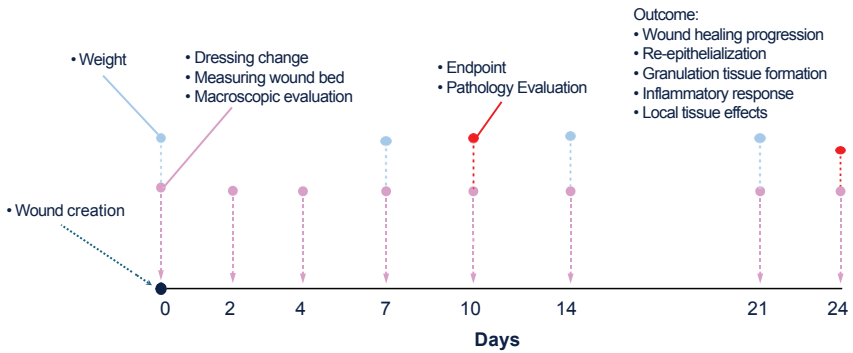
- **Pain management** and **infection control** are critical challenges in the treatment of partial-thickness burn wounds.
- Wound pain can impede healing and lead patients to resist dressing changes, thus d**isrupting treatment adherence and prolonging recovery**.
- Topical antimicrobials help mitigate infection risks but do not address pain, often necessitating opioids with associated risks.
- Local anesthesia (e.g., from topical lidocaine gels) has potential for improved pain relief, patient satisfaction, and opioid reduction,and yet challenges such as non-uniform dosing and potential systemic toxicity in large burns limit their utility.
- To address these gaps, we developed a **novel 510(k)-cleared ultra-thin synthetic matrix incorporating both silver and lidocaine HCl** (equivalent to 4% w/w ointment).

## Methods

Antimicrobial efficacy of the matrix was assessed in vitro, using ISO 22196, against eight clinically relevant bacterial strains.

In vivo performance compared to non-adherent dressing pads was evaluated in a porcine full-thickness excision burn model following ISO 10993 biocompatibility protocols.

**Study Timeline**




In initial evaluations of clinical performance across 5 facilities, the synthetic matrix was applied to 20 patients with a range of wound types, and patient pain was assessed.

**Scan for Instructions for Use**

## Results

- The matrix demonstrated **≥ 4 log[10] reduction in microbial CFUs** at both 24 and 72 hours versus control in ISO 22196 testing (Fig. 1). In vivo, the matrix showed **no impairment of wound re- epithelialization** (Fig. 2), **granulation tissue development**, or i**nflammatory response** (Fig. 3) compared to controls.

**Figure 1. Antimicrobial Activity of Synthetic Matrix Against Clinically Relevant Bacterial Strains**


**Figure 2. Wound Area Reduction & Re-epithelialization with Application of Synthetic Matrix vs. Non-adherent Dressing**

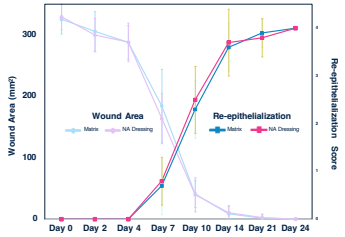
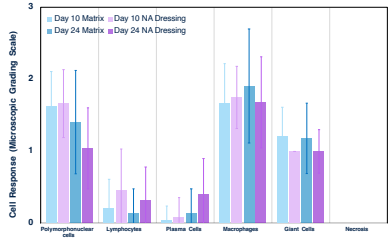


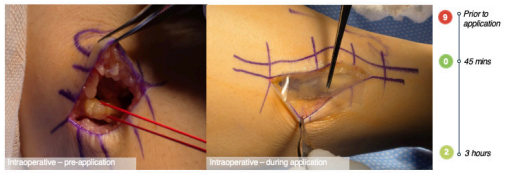

**Figure 3. Inflammatory Cell Response Following Application of Synthetic Matrix vs.Non-adherent Dressing**




- Clinical case observations demonstrated **successful wound coverage, pain relief, and absence of infection-related complications**.

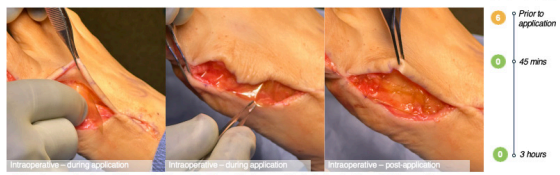
**Patient's Reported Pain (1 - 10 Scale)**

**Surgical wound following neurolysis of common fibular and superficial fibular nerve**
*Synthetic matrix placed at the level of subcutaneous tissue and dermis prior to primary closure*




*Following application, patient's severe pain was reduced to none in less than an hour.*

**Surgical wound following Lapidus / Akin bunionectomy**
*Synthetic matrix placed at the level of subcutaneous tissue and dermis prior to primary closure*




*Following application of the synthetic matrix, the patient was able to halt opioid use 24 hours after surgery.*

*Case examples provided by Damien M. Dauphinee, DPM, FACFAS, FAENS, CWS-P (Carrollton Regional Medical Center, TX)*

## Conclusions

1. The novel silver/lidocaine matrix represents a meaningful advance in burn care, **integrating antimicrobial protection with localized anesthesia in a single dressing**.
2. Its thin film format **ensures unit-dose lidocaine delivery, reducing toxicity risks** while potentially streamlining wound care procedures and decreasing opioid reliance.
3. Future research should assess the matrix's ability to **provide early pain relief and reduce narcotic requirements** in controlled comparative trials to confirm preliminary findings.

Disclosures: Funding for preclinical studies was provided by Imbed Biosciences, Inc. Authors are employees and/or consultants of Imbed Biosciences, Inc.

# Preclinical Study Results

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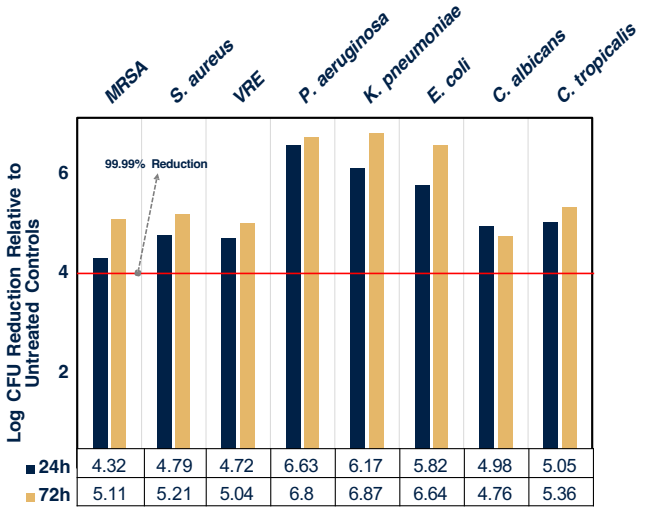


| | MRSA | S. aureus | VRE | P. aeruginosa | K. pneumoniae | E. coli | C. albicans | C. tropicalis |
|---|---|---|---|---|---|---|---|---|
| 24h | 4.32 | 4.79 | 4.72 | 6.63 | 6.17 | 5.82 | 4.98 | 5.05 |
| 72h | 5.11 | 5.21 | 5.04 | 6.8 | 6.87 | 6.64 | 4.76 | 5.36 |

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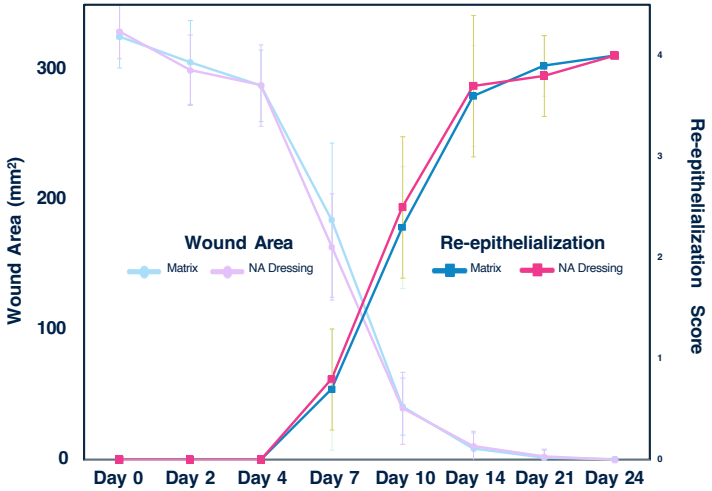


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