

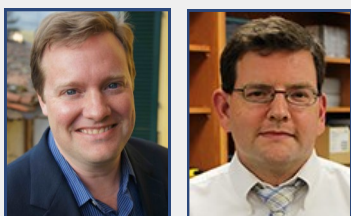
AUBURN UNIVERSITY

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Reference: Wound Probiotic

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Reference

- J. Nat. Prod., 2015, 78 (4), pp 924-928 . ([link](#))

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Probiotic for Wound Healing

Overview

Antibiotics help prevent bacterial infection. However, most antibiotics are broadly acting, killing or preventing growth of both good and bad bacteria and opening the door for drug-resistant microbes to cause infection. A probiotic bacteria has been shown to help prevent infection by multidrug-resistant *Staph. aureus* (MRSA) while keeping normal skin microbiota in place. Treatment of wounds with this probiotic could help prevent infection, aid in wound healing, and prevent development of antibiotic resistance.

Advantages

- Effective against MRSA
- Increases microbial diversity of the skin microbiome at wound site
- Bacillus strain that is generally recognized as safe (GRAS) for easier regulatory approval

Description

More than 350 Bacillus strains were screened for potent antimicrobial activity, safety, and efficacy. A strain of *Bacillus amyloliquefaciens* (AP183) was found to be effective in all three categories. Other strains of *B. amyloliquefaciens* are already in current use as probiotics in plants, animals, and humans and are not associated with disease. AP183 inhibited MRSA *in vitro* and *in vivo*, reducing viable MRSA counts at wound sites by ~70% and eliminating any signs of skin necrosis 5 days after inoculation. The antimicrobial activity of AP183 is thought to be short-lived, possibly avoiding unintended long-term effects on beneficial skin microflora. Future studies hope to demonstrate prevention of life-threatening *Staph* infection in a mouse model and examine the genetic pathways producing the novel antimicrobial compounds.

Status

- Provisional patent application has been filed
- Mouse studies showed improved microbial diversity at wounds and inhibition of MRSA
- Novel Bacillus-made antimicrobial compounds have been identified

Licensing Opportunities

- This technology is available for exclusive or non-exclusive licensing
- Joint development opportunities include funded research or a joint venture

Anti-infective Protection of *B. amyloliquefaciens* Strain AP183.

Mice were injected at two sites; one site with bioluminescent *S. aureus* strain Xen29 alone and a second site with Xen29 and AP183 spores. Mice were monitored for six days. Sites injected with AP183 showed no signs of *S. aureus* growth as detected by bioluminescence (see red dashed circles at shoulders). n=10 mice per treatment.

