Auburn University

Innovation Advancement & Commercialization

Antimicrobial Bandages

Contact

Brian Wright
Auburn University
Innovation Advancement
& Commercialization
334-844-4977
brian.wright@auburn.edu
https://iac.auburn.edu/
Reference: Antimicrobial bandages

Inventors

Dr. S. Davis Worley
Professor Emeritus
Department of Chemistry & Biochemistry

Dr. Roy Broughton
Professor Emeritus
Department of Polymer & Fiber Engineering

Dr. Buket Demir
Postdoctoral Fellow
Department of Chemistry & Biochemistry

Dr. Idris Cerkez
PhD Graduate
Department of Polymer & Fiber Engineering

Reference

Molecules **2017**, *22*(10), 1582; doi: 10.3390/molecules22101582 (link)

Overview

Auburn University is seeking a licensee or development partner for chemical formulations designed to be incorporated into non-woven textiles, with bandages and wound dressings identified as the first application. Current solutions for antimicrobial bandages, including silver and biguanide-based systems, have the disadvantages of extremely high cost, relative ineffectiveness, lack of biodegradability, and/or induced bacterial resistance. Auburn's N-halamine-based system is very inexpensive, has been proven effective against bacteria, and is biodegradable. Further, N-halamine chemistry has been used in other applications for years, and no bacterial resistance mechanism has yet been identified. Thus, this should be a significant improvement to current options for bandages and wound dressings to help control infections in patients, and to help prevent the spread of infection between patients. This technology has potential applications in health care as well as consumer applications. Further, it can be generally applied to any disposable non-woven product.

Advantages

- Demonstrated to kill both Gram positive and Gram negative bacteria, as much as a 6 log reduction in 5 minutes or less and over a 7 log reduction in 30 minutes or less
- Estimated to be 10-100 times less expensive than current antibacterial alternatives
- Biodegradable and disposable
- Can be adapted to multiple non-woven, disposable materials, including bandages, face masks, facial tissues, disposable wipes, air filters, diapers, surgical clothing, etc.

Description

A constant challenge in healthcare is preventing the spread of pathogens to and from patients, focusing on 6 species of bacteria, collectively known as the ESKAPE pathogens. This danger has increased in recent years with the emergence of antibiotic-resistant bacteria, such as MRSA. Currently, hospital-acquired (nosocomial) infections are one of the top 10 leading causes of death in the US. Associated costs surpass $30 billion annually worldwide. The current global market for antimicrobial wound dressings (including consumer use) is $1.7 billion.

This technology is an inexpensive antimicrobial wound dressing utilizing N-halamine chemistry. The active compound is commercially available and can be easily impregnated into non-woven materials. It's expected to add only a few cents to a standard 2x2 gauze, while biguanides are closer to 25 cents and silver can be $5 or more. Further, biguanides are generally ineffective against Gram negative bacteria (e.g., *P. aeruginosa*) and silver is not biodegradable. Preliminary testing has established the product's antimicrobial activity, stability and low toxicity.

Status

- U.S. patent application 20160106098 and pending applications in Australia, EPO, Canada, China, India, Japan and South Korea.
- When incorporated into standard wound dressings, significant killing achieved against two ESKAPE pathogens: *S. aureus* (6 log reduction in 5 minutes or less) and *P. aeruginosa* (over 7 log reduction in 30 minutes or less)
- Initial results have shown materials to be stable when stored in opaque containers, to not leach from the gauze matrix into surrounding media, and to not induce skin irritation
- A related chemistry from Auburn has been commercialized for water purification

Licensing Opportunities

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