Antimicrobial Non-wovens

Overview: Auburn University is seeking a licensee or development partner for chemical formulations designed to be incorporated into disposable non-woven textiles, including bandages, face masks, surgical textiles and air filters. Current options, such as silver and biguanide-based systems used in bandages, 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-halamines have been used in other applications for years with no bacterial resistance mechanism yet identified. Thus, this should be a significant improvement to current options for disposable non-woven products to help control infections in patients and to prevent the spread of infection between patients. This technology has potential in health care and consumer goods since it can be generally applied to any disposable non-woven product.

Advantages:
- **ANTIMICROBIAL** - Demonstrated to kill bacteria (Gram positive & Gram negative), as much as 6 log reduction in 5 minutes or less and over 7 log reduction in 30 minutes or less
- **INEXPENSIVE** - COGS estimated to be 10-100x less than current antibacterial agents
- **CONVENIENT** - Biodegradable and disposable
- **VERSATILE** - Can be adapted to multiple non-woven, disposable materials, including bandages, face masks, facial tissues, disposable wipes, air filters, diapers and surgical textiles.

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 agent 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:
- Issued U.S. patent 10,178,866 with pending applications in US (20190160199), EPO, Australia, 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
- This technology is available for exclusive or non-exclusive licensing