ResInnova LABORATORIES

December 17, 2014

To: Karan Jhunjhunwala
LifeThreads
45 West 45th St
New York, NY

From: Matthew Hardwick, PhD
ResInnova Laboratories
7400 Flower Ave
Takoma Park, MD

Dear Karan,

Enclosed you will find my synopsis of your previous testing performed by various laboratories. I am not including test results performed prior to Fall 2013 those performed for companies other than LifeThreads. My reason for not including these results is straightforward; it is clear that other chemistries were involved (perhaps an evolution of the current formula or other formulas not included in the current formulation). If you would include these results, I will need more information regarding the more technical aspects of these prior textiles.

As always, please contact me with any questions regarding this report.

Sincerely,

Matthew Hardwick, PhD
President and CEO

Healthcare-associated infections (HAIs) and increasing bacterial resistance have emerged as a major challenge to the healthcare system. In the US there are an estimated 1.7 million HAIs yearly with nearly 100,000 associated deaths. HAI pathogens may be spread between patients via vectors such as healthcare worker clothing. Work clothes may become contaminated during patient care, and thus have the potential for transmission of medically important pathogens to both patients and staff.

LifeThreads manufactures an antimicrobial textile that includes a fluid barrier. They have performed a numerous tests to demonstrate the efficacy of its antimicrobial textiles. All of the tests performed strongly indicate that LifeThreads antimicrobial textiles are highly effective against important pathogens such as *Staphylococcus aureus* (*S aureus*), including Methicillin-resistant *S aureus* (MRSA), and *Escherichia coli* (*E coli*). In every test performed, LifeThreads antimicrobial textiles reduce bacterial concentrations by > 99.9%.

Specific Tests

AATCC TM 100 is a quantitative procedure for the comparison and evaluation of the degree of antibacterial activity after a 24 h exposure to the test bacteria on the test fabric. Relative to untreated control textiles (UTCs; textiles without antimicrobial or fluid barrier chemistries), LifeThreads antimicrobial textiles reduced *S aureus* by 99.96% and *E coli* by 99.98%.

AATCC TM 147 is qualitative estimate of antimicrobial activity. This test further allows for detection of a zone of inhibition surrounding the specimen that determines if the antimicrobial chemistry leaches away from the textile. LifeThreads antimicrobial textiles completely abrogate growth of both *S aureus* and *E coli*. Further, no zone of inhibition was seen with LifeThreads antimicrobial textiles indicating that its antimicrobial chemistry does not leach out of the textile.

Splatter Fabric Challenge is a test designed to recapitulate transmission of pathogens via splatter and test the efficacy of antimicrobial textiles in a more “real world” simulation. A splatter is a bulk transfer of fluids commonly seen in the healthcare environment (ie – blood, urine, vomit). LifeThreads antimicrobial textiles performed exceedingly well in the Splatter Fabric Challenge reducing MRSA levels with a range between 4.09 and 4.48 log colony-forming units (CFUs). A 4 log reduction is the equivalent of a 99.99% reduction. For perspective, UTCs reduced MRSA with a range between 1.90 and 2.37 log CFUs. See Table 1 and Figure 1 for more detail.

Conclusions

LifeThreads antimicrobial textiles are extremely effective at reducing the concentrations of important pathogens such as *S aureus* (including MRSA) and *E coli* in a variety of antimicrobial tests. These results suggest that antimicrobial textiles, especially those including fluid barrier chemistries, may be effective strategies at combatting healthcare-associated infections.

Table 1: Compiled Results of Splatter Fabric Challenge

Exposure Time (min)	Sample	Log Reduction (CFUs)
0	Untreated Control	1.90
	LifeThreads	4.43
30	Untreated Control	2.07
	LifeThreads	4.48
60	Untreated Control	2.37
	LifeThreads	4.09

Figure 1: Splatter Fabric Challenge Results