

Overview

iFyber coatings have been developed specifically for wound care products to reduce the incidence of healthcare acquired infection. iFyber coatings exhibit minimal leaching and actively kill infection causing pathogens without adversely affecting the cell growth necessary for wound regeneration.

Applications

- Fiber based materials - natural, synthetic, woven, non-woven
- Collagen based materials
- Extra-Cellular Matrix (ECM) materials

Antimicrobial Activity

Bactericidal experiments have been performed on both Gram negative and Gram

positive bacterial pathogens using ASTM method E2149-01 for determining antibacterial activity (reduction in colony forming unit counts) of immobilized agents under dynamic contact conditions. iFyber coatings exhibit tremendous antimicrobial activity that outperforms commercially available technology.

Figures 2 and 3 illustrate iFyber's effectiveness against multi-drug resistant bacterium *A. baumannii* and have been published in a peer-reviewed scientific journal.¹ Further development is being conducted to determine antimicrobial activity for a host of drug resistant pathogens.

¹ N. C. Cady, J. L. Behnke, A. D. Strickland, *Advanced Functional Materials* 21, 2506-2514 (2011)

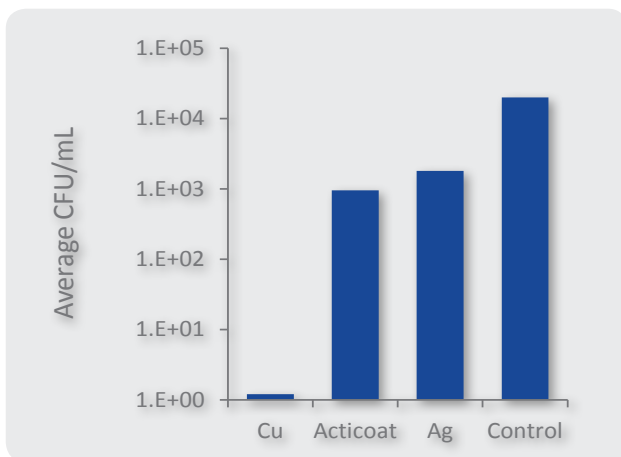


Figure 2: Reduction in average colony forming units of *A. baumannii* after 1h exposure. (Actual Value for Cu sample is 0 CFU/mL⁻¹) Control - uncoated cotton, Cu - iFyber copper coated cotton, Ag - iFyber silver coated cotton and Acticoat™ - commercially available wound dressing from Smith & Nephew

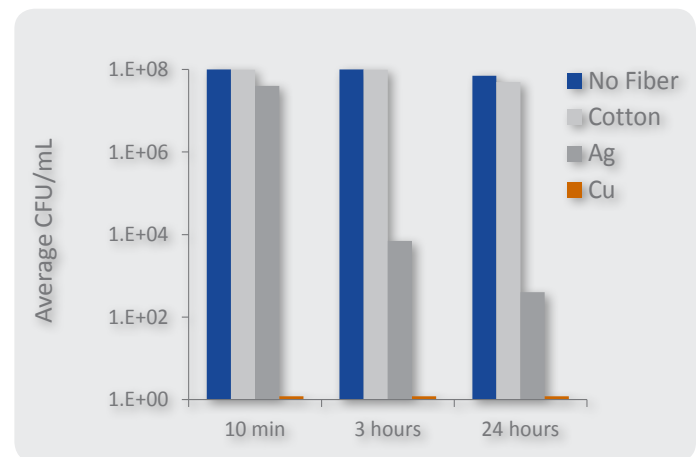


Figure 3: Reduction in average colony forming units of *A. baumannii* for varying time exposures. (Actual Value for Cu sample is 0 CFU/mL⁻¹) Control - uncoated cotton, Cu - iFyber copper coated cotton, Ag - iFyber silver coated cotton

Mammalian Cell Viability

To play a clinically relevant role in wound care, antimicrobial coatings cannot adversely effect the fibroblasts and epithelial cells that are integral to wound regeneration. A growing body of literature indicates that these and other eukaryotic cells can be adversely affected by metal-based antibacterial agents. The effects iFyber coatings have on mammalian cells were studied¹ and the results show iFyber coatings do not adversely affect mammalian cell viability and may even aid cell proliferation (Figure 4).

Minimal Leaching

Uncontrolled release of antimicrobial materials through diffusion and leaching can have deleterious effects. High levels of leaching result in the depletion of antimicrobial activity and can overload the target matrix with the agent, thus contributing to the overuse and indiscriminate release of metals. iFyber coatings applied using our proprietary deposition process result in a stable coating-substrate interface, thus minimizing the leaching of antimicrobial agents from their solid support (Figure 5).

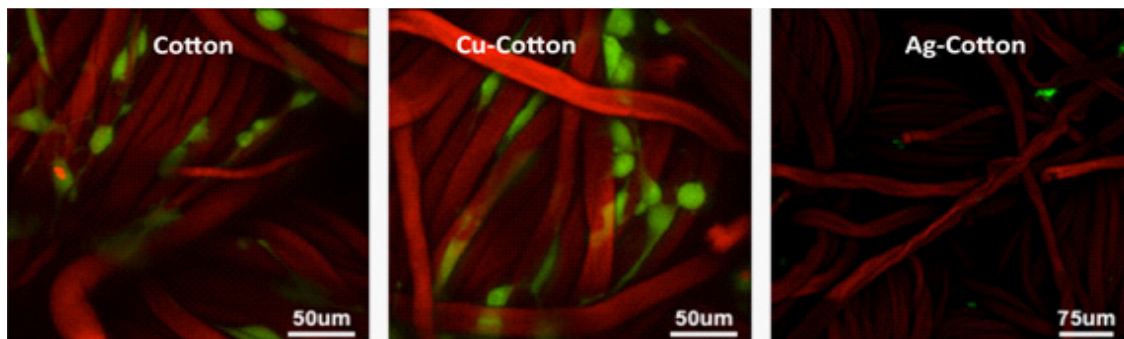


Figure 4: The fluorescence images above were taken with laser scanning confocal microscopy after live/dead staining where Red cells = dead, Live cells = green, and Fibers = red due to autofluorescence. Mouse fibroblast cells were incubated for 48 hrs with the cotton composites and the images above show healthy cells on the cotton control and on iFyber Cu cotton while few living cells were observed on iFyber Ag coated cotton.

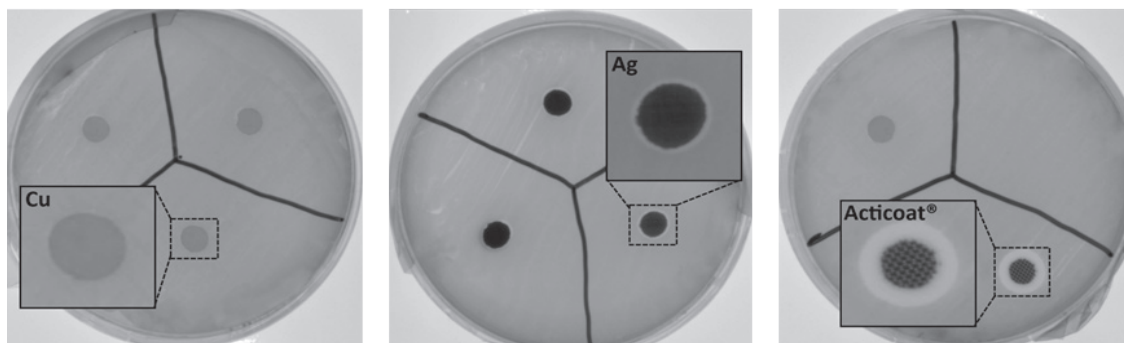


Figure 5: The leaching properties of iFyber Cu, iFyber Ag and Acticoat™ antimicrobial coatings were compared through zone of inhibition experiments.¹ iFyber coatings exhibited significantly lower levels of leaching compared to Acticoat™.