

## **Wireless Electroceutical Dressing Inhibition of Azole sensitive and resistant strains of *Aspergillus fumigatus***

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### **Background/Objective:**

The opportunistic fungus *Aspergillus fumigatus* is responsible for nosocomial infections, particularly in immunocompromised patients. Fungal infections are increasingly likely in burn victims, as the epidermis serves as the body's first line of defense against microbial pathogens. In an effort to utilize complementary methods of control, an electroceutical dressing containing geometrically patterned silver and zinc nanoparticles embedded in fabric was used. The dressing utilizes generates a weak electric field when moist to produce antimicrobial effects. Preliminary research showed that the dressing effectively inhibited *Candida albicans*. This foundational research has led us to hypothesize that the electroceutical dressing could also be an effective option for inhibiting *A. fumigatus*. The objective of this project was to establish the inhibitory effects of the dressing across multiple strains of *A. fumigatus*.

### **Methods:**

We used both radial growth on Aspergillus Minimal Media (AMM) agar plates and concentration in AMM liquid cultures to determine *A. fumigatus* growth rates. The plates were initially inoculated with 100 conidia of *A. fumigatus*. Liquid cultures were inoculated with 200,000 conidia/mL. The liquid cultures Radial growth was measured daily for 14 days, and concentration was measured every third day for 24 days.

### **Results:**

Our results show that the Wireless Electroceutical Dressing (WED) effectively inhibits *A. fumigatus* growth.

### **Summary:**

The data indicates that WED inhibits azole resistant and non-resistant strains of *A. fumigatus*. By illustrating the effectiveness of the electroceutical dressing, it presents additional options for controlling *A. fumigatus* infection. Additional research should be conducted to determine if the dressing is fungistatic or fungicidal, along with assessing its effectiveness in inhibiting other fungal infections.