

# MicroSilver BG™

## Antiseptic (Antibacterial, Antifungal, and Antiviral) Efficacy

MicroSilver has proven effectiveness against most topical animal pathogens of interest including MDR *Pseudomonas aeruginosa*, Methicillin-resistant *Staphylococcus aureus* (MRSA), Methicillin-Resistant *Staphylococcus pseudintermedius* (MRSP) and *Malassezia pachydermatis*. The biofilm development creates an environment conducive to the spread of infection. The antibiofilm effect of MicroSilver further potentiates the effect of azoles and chlorhexidine against these pathogens. Products formulated with MicroSilver are effective in eliminating harmful microorganisms while the damaged skin is gently repaired with the long-lasting residual effects of MicroSilver.

### Select MicroSilver Efficacy Studies

#### **1. An Independent Iowa State University, College of Veterinary Medicine, Comparative Efficacy study entitled, “Residual in vitro activity of canine hair against *Staphylococcus pseudintermedius* and *Malassezia pachydermatis* following a single antimicrobial bath.**

The purpose of this investigation was to evaluate 4 antimicrobial shampoos commonly used by practitioners to determine if differences existed between these products regarding residual in vitro activity on canine hair against *Staphylococcus pseudintermedius* and *Malassezia pachydermatis* following a single application. Hairs collected from dogs bathed with BioHex Shampoo containing MicroSilver (2% Chlorhexidine and 2% Miconazole with 0.1% MicroSilver) had a zone of inhibition, against *Staphylococcus pseudintermedius*, that was larger than the zone of inhibition and was statistically significant, from dogs bathed with DOUXO Chlorhexidine Shampoo and MiconHex+Triz Shampoo. The zone of inhibition from dogs bathed with BioHex Shampoo was numerically larger than the zone of inhibition from dogs bathed with Malaseb Shampoo. These results suggest the superior residual antimicrobial activity of MicroSilver

#### **2. In vitro Biofilm Study entitled, “Activity of micronized silver and micronized silver containing topical product against *Staphylococcus pseudintermedius* and *Pseudomonas aeruginosa* biofilm.**

The objective of this study was to determine the activity of micronized silver, as well as in a topical shampoo product used for skin infections against *Staphylococcus pseudintermedius* and *Pseudomonas aeruginosa* biofilms. All concentrations of micronized silver (from 0.5% to 0.05%) eradicated biofilm in MBEC assays (MBEC < 0.05%). The shampoo product also eradicated biofilms at 1:10 concentration. The results indicate that micronized silver and micronized silver containing topical products are effective at eradicating the biofilm in an established in vitro model for *P. aeruginosa* and *S. pseudintermedius*

### **3. In vitro Biofilm Study entitled, “In vitro activity of micronized silver and a micronized silver containing shampoo against clinical isolates of Multi-drug resistant of *P. aeruginosa* and Methicillin-Resistant *Staphylococcus pseudintermedius* (MRSP) biofilms.**

The objective of this study was to further determine the antibiofilm activity of micronized silver in plain solutions as well as in a topical product (BioHex Shampoo) against Methicillin-resistant *S. pseudintermedius* (MRSP) and MDR *Pseudomonas aeruginosa* clinical isolates biofilms.

The lowest concentration of micronized silver that inhibited the formation of biofilms of MDR *Pseudomonas aeruginosa* and MRSP was determined to be 0.05 % v/v. BioHex Shampoo was only tested at 1:10 concentration and eradicated the biofilms of both multi-drug resistant clinical isolates of *P. aeruginosa* and MRSP. The results indicate that micronized-silver and micronized-silver containing topical products are effective at eradicating the biofilm in an established in vitro model for *P. aeruginosa* and *S. pseudintermedius* including MRSP and MDR *P. aeruginosa* clinical isolates.

### **4. Antiviral Efficacy of MicroSilver BG™ and products that contain MicroSilver BG™ against enveloped viruses.**

The family of enveloped viruses include coronaviruses. BioGate evaluated the antiviral activity of MS in the following MS containing products.

1. Hand Gel A with 0.1% MS and 63% alcohol
2. Hand Gel B with 0.1% MS and 38% alcohol
3. Surface Spray with 0.1% MS
4. Shampoo with 0.1% MS.

Screening was performed according to EN 14476, quantitative Suspension Test for the Evaluation of Virucidal Activity in the Medical Area (European Standard for virucidal activity of chemical disinfectant and antiseptic products). All the products tested showed > 99% virucidal activity after 30 minutes of application. Hand Gel A, B and Shampoo had > 99% virucidal activity after 2 minutes of application. In addition, the tests demonstrated a synergistic effect between MicroSilver BG and alcohol as well as with surfactants and soaps.

Inhibits > 99.9% of bacterial germs even 7 days after application:

- Textile was sprayed and tested 2 weeks later against *Staphylococcus epidermidis* with >99.9% reduction efficacy

Tested against enveloped viruses (MVA):

- > 94.4% reduction in 2 minutes
- > 99.9% reduction in 30 minutes
- Spray was tested against enveloped MVA viruses