MicroSilver:

An Innovative and Novel Approach in Dermatology

What is MicroSilver?

MicroSilver BG™ is a pure silver powder consisting solely of highly porous and micro-sized **(NOT Nano)** particles of medical grade silver (99.99% purity). MicroSilver's average particle size is 10 micrometers, which is 10,000 times larger than a nanometer. The silver particles physically attach to the skin & hair follicles and provide a sustainable depot of pure silver that continuously generates positive silver ions resulting in long-lasting broad spectrum Antimicrobial and Antibiofilm activity.

What is MicroSilver's mechanism of action?

MicroSilver has synergistic Antimicrobial and Antibiofilm activity. MicroSilver interferes with multiple components of bacterial cell structure and functions.

Mode of Action as an Antimicrobial - MicroSilver on contact with the skin surface generates positive ions (Ag+) that are able to physically interact with the cell structure of various pathogenic bacteria. The positively charged silver ions attach to many negatively charged components of the pathogen including the trans-membrane proteins, the intracellular enzymes, ribosomes and nucleic acids. This binding action results in the following:

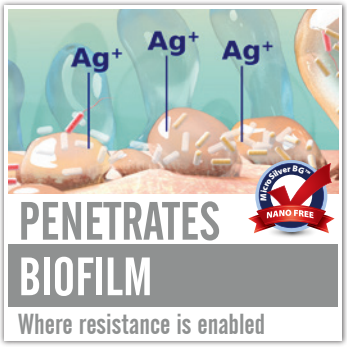
1) Damage to cell membranes leading to structural changes, including increased permability, ultimately resulting in bacterial cell death.
2) The silver ions also bind to the negatively charged nucleic acids in the DNA, leading to disruption of DNA replication and cell death.
3) Silver ions interact with a number of intercellular enzymes leading to arrest of bacterial cell metabolism.
4) Alterations in protein synthesis further weaken the survivability of the bacteria and contribute to the destabilization of the composition of the outer membrane. The membrane damage further induces the release of reactive oxygen species (ROS), forming free radicals with a powerful bactericidal action against transient pathogens.

Mode of Action as an Antibiofilm - Biofilms consist of microorganisms and their self-produced extracellular polymeric substances. MicroSilver, by its charge influx, decreases bacterial adhesion and destabilizes the biofilm by its positively charged ionic interaction.

Bacterial resistance to MicroSilver is extremely rare because of the presence of the multiple bactericidal mechanisms that act in synergy.

What are the Pharmacological properties of MicroSilver?

MicroSilver has proven Antiseptic and Antibiofilm properties:



What studies have been conducted that demonstrate the Pharmacological properties of MicroSilver?

Numerous studies have been conducted by BioGate that document the proven Antimicrobial spectrum of MicroSilver against many species of bacteria including Pseudomonas and multidrug resistant Staphylococcus.[1]

Staphylococcus pseudintermedius and *Pseudomonas aeruginosa* are known biofilm producers, a recognized virulence factor in canine bacterial infections. *In vitro* studies conducted by VetBiotek have shown that MicroSilver at various concentrations and SilVet MC Shampoo (a MicroSilver containing topical product) effectively inhibit biofilm formation of both Pseudomonas and Staphylococcal bacteria.[2] The confirmation that both MicoSilver and MicroSilver containing commercial products are effective in destroying biofilms brings to light the role these products play in the management of biofilm forming canine otitis and dermal infections.

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[2]Manuscript submitted for journal publication.

[1]Studies on file, Bio-Gate AG

VETBIOTEK Innovative Solutions

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