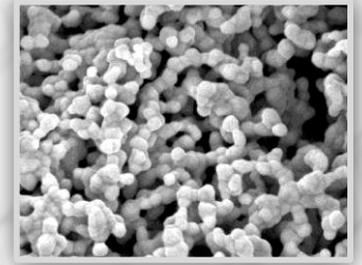
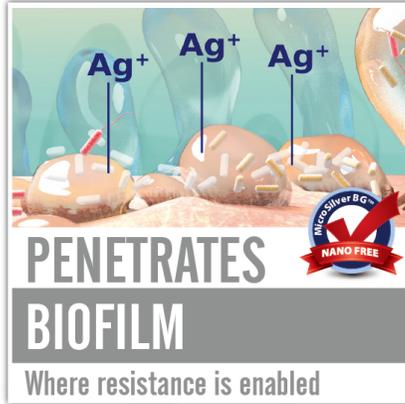


BIOHEX™ SHAMPOO



MicroSilver BG™
10µm Particle
(SEM Photo of one particle)

MicroSilver BG™ (Antibiofilm), Ceramide III (Lipid Barrier),
Chlorhexidine (Antimicrobial) and 'azoles (Antifungal)



MicroSilver BG™



Ceramide III

BETTER TOGETHER - ENHANCED EFFICACY

Antibiotic Resistance is a Problem

- **Antibiotic resistance** is not only a serious concern for humans, it is also a rapidly growing problem for our companion animals.
- **Veterinarians are seeing dramatic increases in bacteria strains that are resistant to multiple classes of drugs.**
- The MRSA / MRSP bacteria is the most widely recognized example of a potentially fatal staph infection that is resistant to even the most powerful antibiotics in use today.

*“Too-frequent and unnecessary use of these drugs is contributing to the escalating problem of antibiotic resistance in pets, just as it is in people.” **

*DVM 360

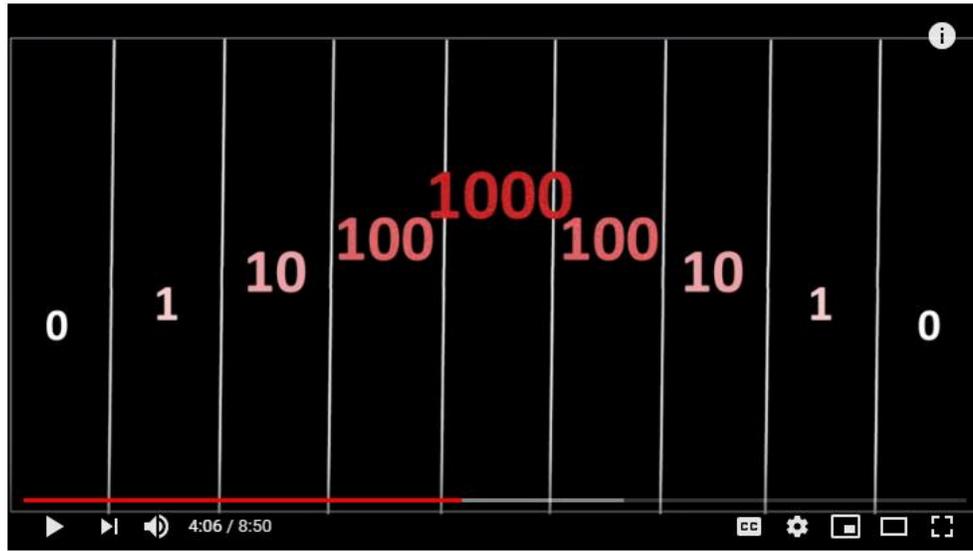
ANTIBIOTIC RESISTANCE



Everyday in the news, MDR

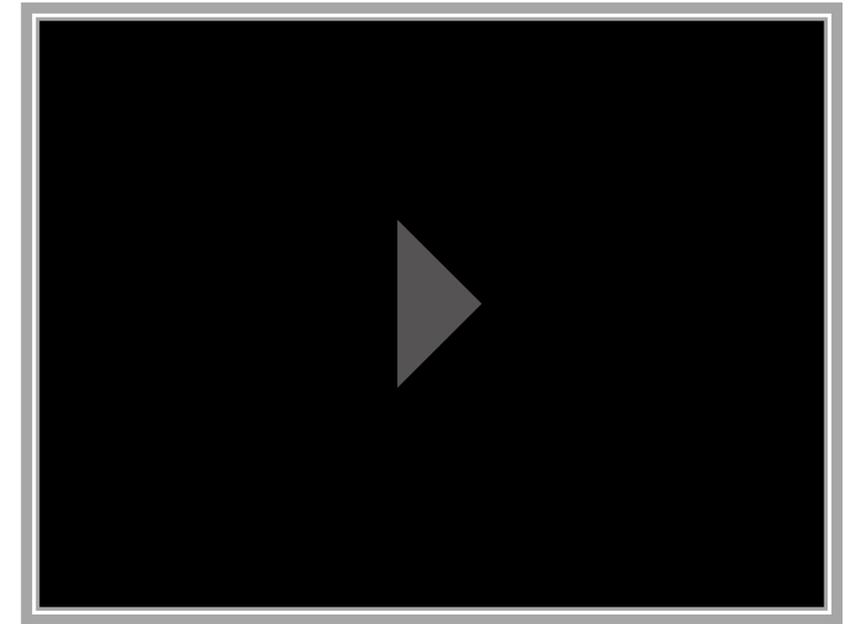


Harvard Video Showing evolution of bacteria against Antibiotics



Superbugs That Resist Antibiotics Can Evolve in 11 Days | | Contain Multitudes

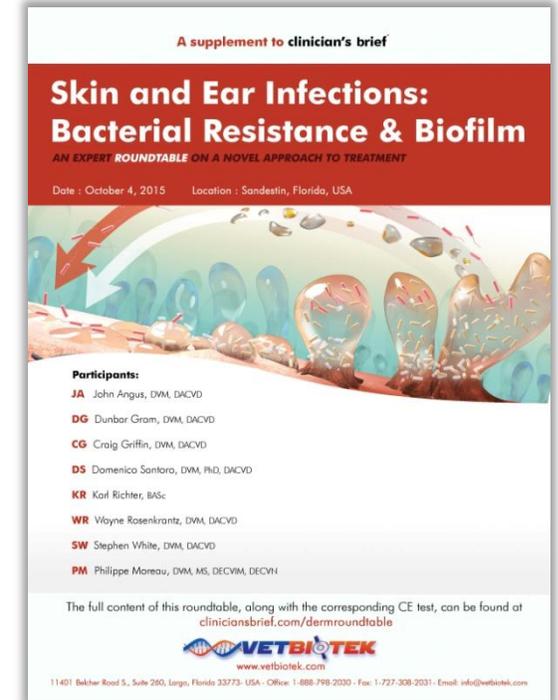
In 11 Days Ecoli is able to mutate and overcome 1000 x the MIC of antibiotics



Read the full story at hms.harvard.edu/news/bugs-film

The Rise of Bacterial Resistance

- As much as 70 to 80% of culture and sensitivity tests conducted at veterinary dermatology referral clinics today show antibiotic resistance or multi-drug resistance.
- A retrospective study conducted by Dr. Wayne Rosencrantz DACVD, at Animal Dermatology Clinic in Tustin, California showed an increase in resistant pathogen (MRSP) over a two year period (2012 – 2014) from 26% to 60% respectively!*



*Clinicians Brief Date: October 4, 2015

How Can We Reduce the Rise of Bacterial Resistance

- Conduct more culture & sensitivity tests
- Use specific antibiotics to which the pathogen is susceptible.
- Address accurate MIC levels for antibiotics
- **Use topical therapy first for superficial pyoderma!**

- **The WAVD* states: Consensus statement 5:** Topical therapy, using antibacterial agents with proven anti-staphylococcal efficacy, is the recommended treatment modality for any surface and superficial pyoderma involving MRS, particularly those with localized lesions, and for otitis and superficial wound infection.

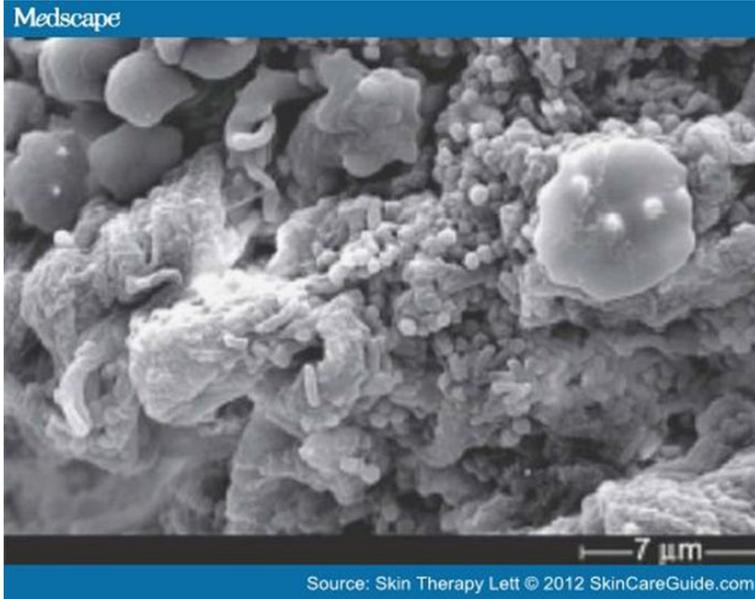
Consensus statement 6: Topical therapy should be used as the sole on-animal antibacterial treatment for surface and superficial infections whenever a pet and owner can be expected to be compliant.

*Morris D, Loeffler A, Davis M, et al. Recommendations for approaches to methicillin-resistant staphylococcal infections of small animals: diagnosis, therapeutic considerations and preventative measures. *Vet Dermatol* 2017; 28, 304-e69

Isolate 1 : Pseudomonas aeruginosa

Antibiotic	Result	MIC	Reference	Range
Enrofloxacin	Resistant	>=2	0.25 sssR	2
Marbofloxacin	Resistant	>=4	0.5 ssrR	4
Pot Sulphonamide	Resistant	>=320	10 sssrrR	320
Gentamicin	Resistant	>=16	0.5 ssssiR	16
Amikacin	Resistant	>=64	2 ssssiR	64
Ceftazidime	SENSITIVE	<=8	8 Sir	32
Piperacillin	SENSITIVE	<=8	8 Ssssrr	256
Carbenicillin	Intermediate	256	16 ssssiR	512
Ticarcillin	SENSITIVE	64	16 ssSrr	256
Tobramycin	SENSITIVE	4	0.5 sssSir	16

Biofilm is a Contributing Factor



Bacteria growing in a biofilm are highly resistant to antibiotics, up to 1,000 times more resistant than the same bacteria not growing in a biofilm. Standard antibiotic therapy is often useless.

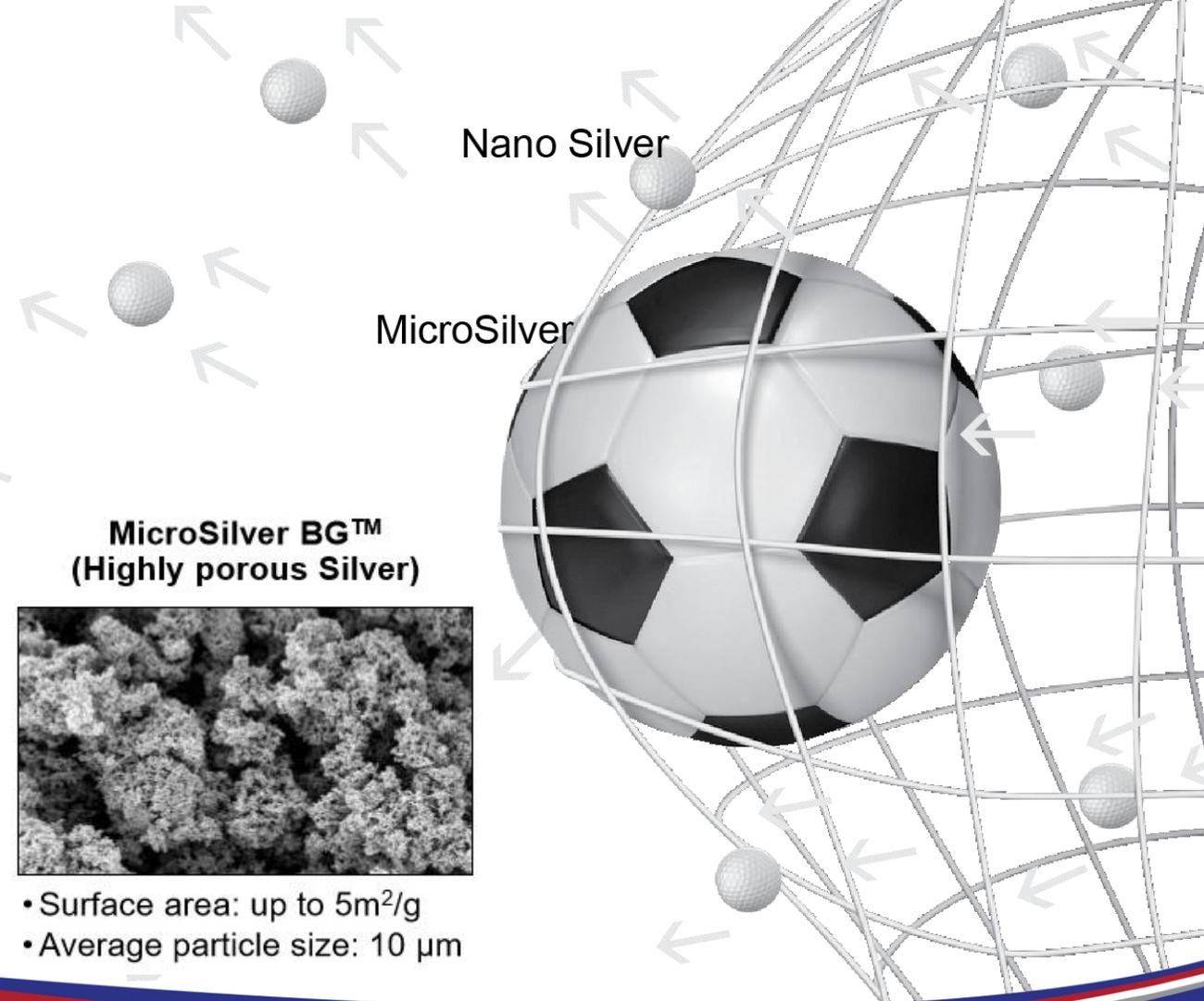
*Medical Definition of Biofilm
Medical Author: William C. Shiel Jr., MD, FACP, FACR*

MicroSilver

The Story and History

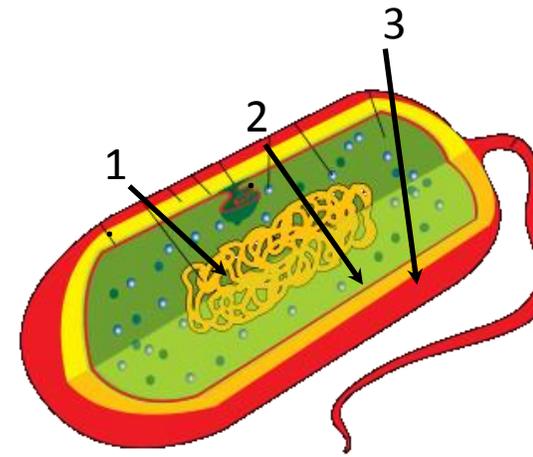
- Historically silver has been a natural antimicrobial – Dating back to the 5th Century B.C.
- Used extensively until the advent of Penicillin
- MicroSilver BG is a pure silver powder consisting of highly porous and micro-sized (NOT nano!) particles of medical grade silver.
- Currently there is No-Antibiotic resistance to MicroSilver
- MicroSilver is an antimicrobial for various applications including:
 - Skincare, cosmetics, oral care, medical devices e.g. wound care, dental filler, and bone cements)

MicroSilver vs Nano Silver



MicroSilver Mode of Action

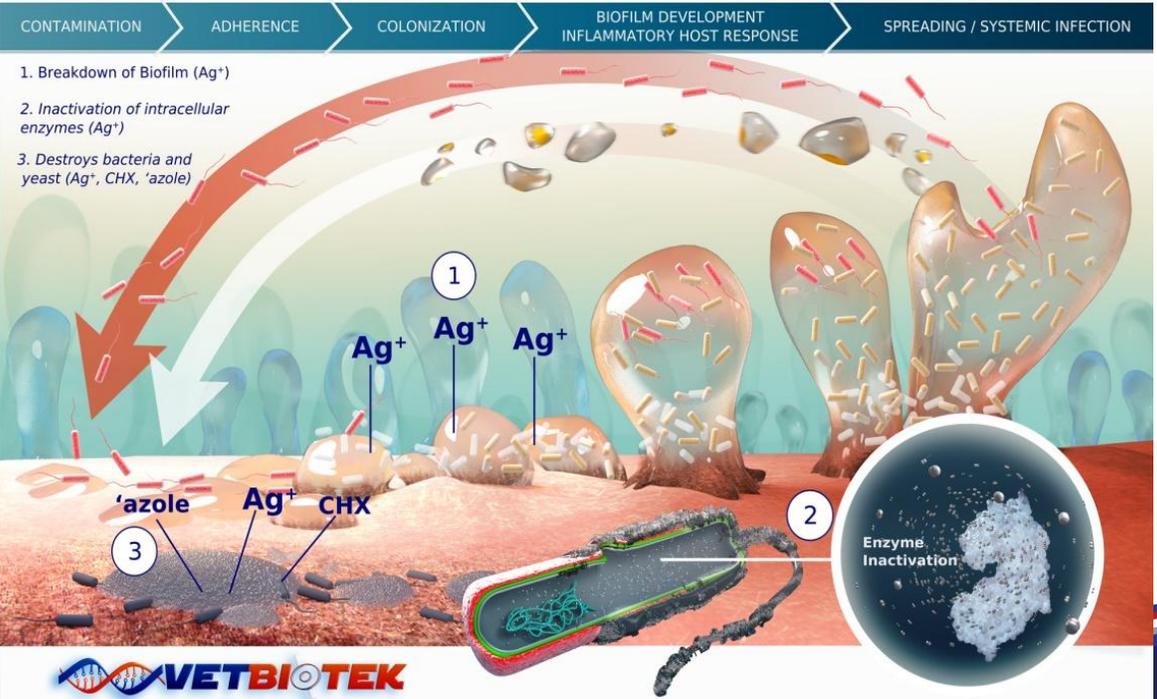
- Most broad spectrum antimicrobial available today
- Effective against bacteria, fungus/molds, and antibiotic resistant germs (Gram + and Gram -)
- Attacks bacteria in 3 ways (multi-modal), unlike antibiotics that attack only 1 way
- Attacks only the bad bacteria that reside on the Epidermis
- MicroSilver is clinically proven to destroy Biofilm (including MRSP Biofilm)
- Long Lasting Effect (up to 7 days)



1. Inhibition of trans-membrane transport proteins
2. Inactivation of intracellular enzymes
3. Damage of bacterial DNA

ANTIBIOFILM / ANTIBACTERIAL

MicroSilver BG™



MicroSilver Safety

- MicroSilver is Nano-Free unlike Colloidal Silver and Silver Salts
- 10µm particle size = 1000 times larger than nano-silver (no systemic absorption)
- Pure (99.97%) medical grade silver
- MicroSilver products can also be used in conjunction with antibiotics
- *In vitro* tests have shown products such as toothpaste and wound care have demonstrated safety and effectiveness for over 10 years.

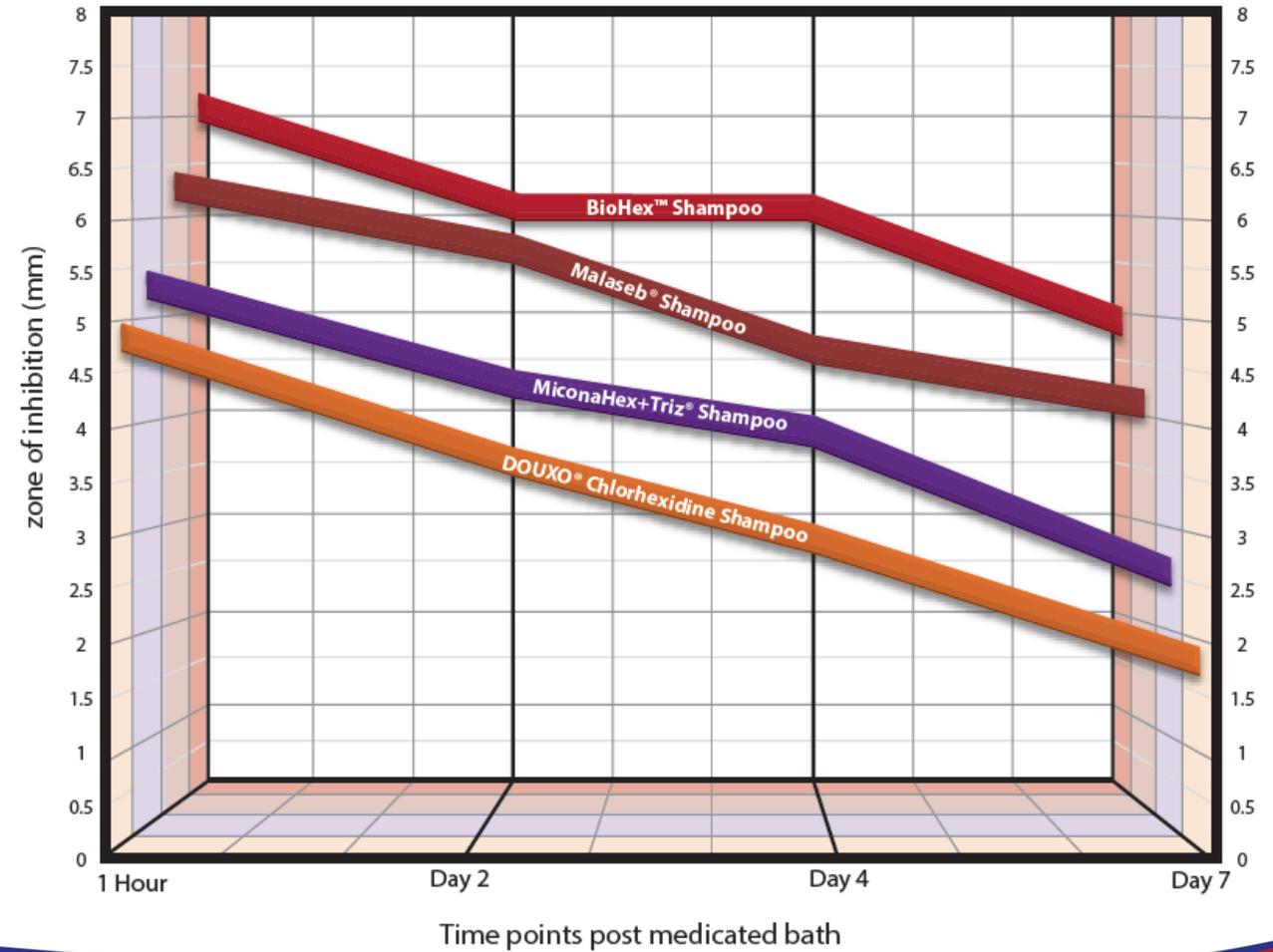


Residual Activity of Shampooed Hair Against *S. pseudintermedius*

Iowa State University
Noxon, Berger, et al

$P < 0.05$

- BioHex Shampoo
- Malaseb® Shampoo
- MiconHex+Triz® Shampoo
- DOUXO® Chlorhexidine Shampoo



Observations

- Prior to medicated baths, hairs did not have antimicrobial activity (data not shown)
- Hairs collected from dogs bathed with BioHex™ had zones of inhibition statistically greater than those bathed with Miconahex+Triz® or DOUXO® ($p < 0.05$)
- At 7 days BioHex Zone of Inhibition were statistically equal to Miconahex+Triz or DOUXO at 1 hour.
- No difference in activity against Malassezia except for Time point 2 in which BioHex was statistically greater than DOUXO.

Staphylococcus pseudintermedius Time Points Post Bath

Brand	1 Hour	2 days	4 days	7 days
BioHex™	7.1	6.1	6.1	4.9
Malaseb®	6.3	5.7	4.6	4.2
Miconahex+Triz®	5.3	4.3	3.8	2.5
DOUXO® Chlrx	4.9	3.5	2.7	1.7

Iowa State University - Noxon, Berger, et al

Ceramide III

N-Octadecanoylphytophingosine

Ceramide III (Cer 3)

Skin Identical Molecule

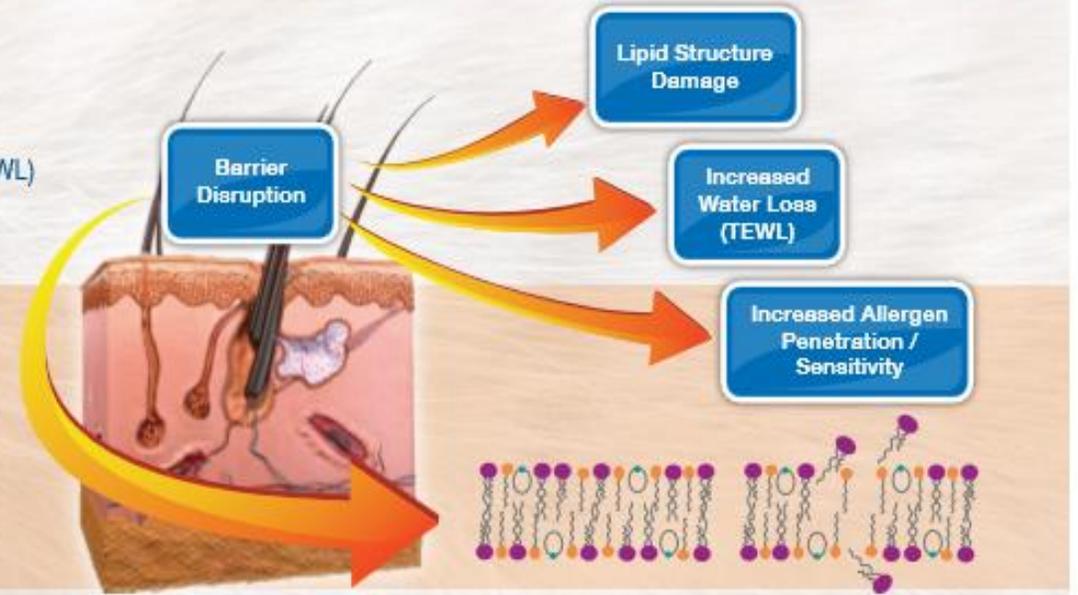
Supports against Transepidermal Water Loss (TEWL)

Helps to Restore the Lipid Barrier

Aids in the Protection and Sealing of the Barrier

Causes of Barrier Disruption

- Environmental Stress
 - Allergic Response
 - Low Humidity
- Genetics
- Aging Process



- **Second generation** lipid barrier technology
- **Skin identical** molecule
- **Reinforces** the natural lipid barrier of dry and aging skin
- **Decreases sensitivity** by repairing the barrier- preventing allergen penetration
- **Decreases Trans-epidermal water loss (TEWL)**
- Atopic Skin (Allergies) **Deficient in Ceramide III**

BioHex Shampoo



8 oz., 16 oz.
and Gallon

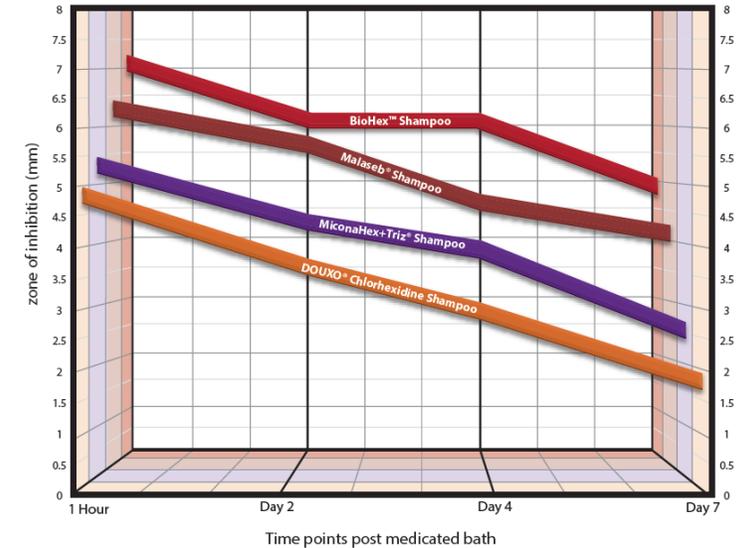
Features

Synergistic Antiseptic Formulation in a luxurious soap free shampoo

- 2% Chlorhexidine/
- 2% Miconazole
- .1% MicroSilver
- Ceramide III

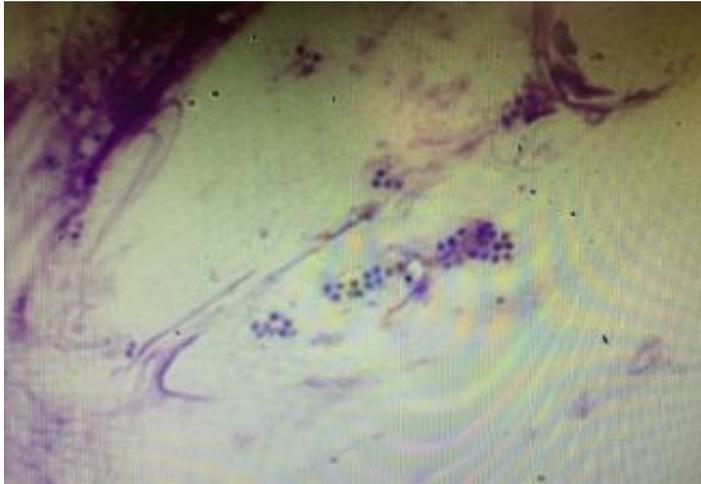
Benefits

- Antifungal, Antibacterial
- Penetrates the Biofilm
- Longest residual activity
- Prevents TEWL
- Repairs the lipid barrier
- Clinically proven



Clinical Case Managed with BioHex Shampoo

Courtesy of: Galia Sheinberg DVM, DLACVD



Cytology

Before:



Subject:

Shih tzu

7 years old

Canine Allergic Dermatitis

Life long problems

Pyoderma and very itchy

After: (8 weeks)



Treated with:

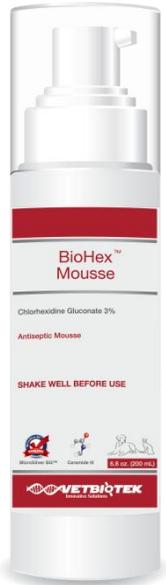
No Antibiotics

BioHex Shampoo

Cytopoint®

BioHex Mousse and Wipes

Water Based Formulations that are Cosmetically Appealing, Lipid Barrier Restoring which Facilitates Compliance.



200 mL pump



50 count pads



Features

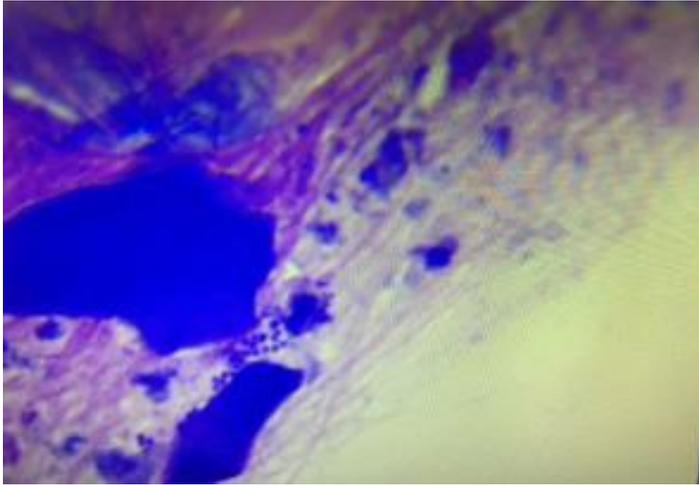
- 3% Chlorhexidine
- .5% Climbazole
- .1% MicroSilver
- Ceramide III

Benefits

- Antifungal, Antibacterial
- Penetrates the Biofilm
- Residual activity
- Prevents TEWL
- Repairs the lipid barrier

Clinical Case Managed with BioHex Mousse / Wipes

Courtesy of: Galia Sheinberg DVM, DLACVD



Cytology

Before:



Subject:
Mini Schnauzer
Post Clipping Pyoderma

After: (6 weeks)

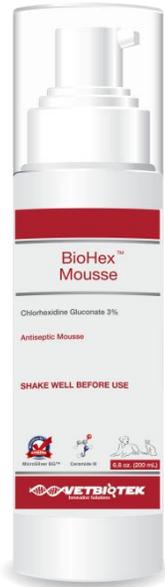


Treated with:
No Antibiotics
BioHex Mousse
BioHex Wipes
Apoquel®

The Perfect Choice



8 oz., 16 oz.
and Gallon



200 mL pump

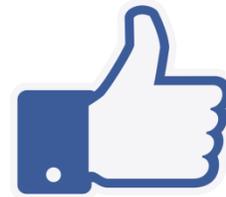
When managing surface and superficial pyoderma, BioHex Shampoo, Mousse and Wipes are the Perfect Choice!



50 count pads

Questions?

Find us online at:
www.vetbiotek.com



Like us on facebook