

# Tris-NAC



Biofilm  
Busting Ear &  
Skin Flush



# BIOFILM: An Increasing Problem

## What is Biofilm

An accumulation of bacteria contained in an extracellular matrix of polymeric substances. This protects the bacteria not only from antibiotics and chemicals, but also from the body's immune system. A biofilm can form on medical equipment as well as on animal tissue.

This biofilm creates resistance to antibiotics; in fact, bacteria in a biofilm can be 100-1000 times more resistant than 'free' bacteria.

Some types of bacteria are capable of producing biofilms, including *Staphylococcus pseudintermedius*, *Pseudomonas aeruginosa* (especially in canine otitis, Figs 1 and 2), *Proteus Mirabilis* and *Escherichia coli*.

Yeasts (*Malassezia* spp.) can also produce biofilms, especially in the case of seborrheic dermatitis in dogs. Treatment: topical therapy is the most innovative treatment and involves not only the use of active substances, but also the combination of such substances to bundle their activity.

## TRIS-EDTA (ethylenediaminetetraacetic acid):

TRIS-EDTA has a bacterial action against non-growing bacteria within the biofilm (Ciofu et al, 2017); together with Tromethamine (Tris) it damages the cell wall of the bacteria and increases the penetration into the membrane. It is well tolerated and non-ototoxic. Together with chlorhexidine there is an enhanced effect (Guardabassi et al, 2010). Recently, an in vitro study showed that Tris-EDTA, in combination with antibiotics, provides effective support in the treatment of chronic *Pseudomonas* otitis with potentially involved biofilms (Pye et al, 2014).

## NAC (N-acetylcysteine):

N-acetylated derivative of the amino acid cysteine has a mucolytic action; it destroys the production of exopolysaccharides and thus weakens the EPS matrix. It was recently used in eight clinical trials as an adjunctive treatment to destroy or prevent biofilm formation. It turned out to be very effective and safe. A combination of Tris-EDTA and NAC on the skin and in the ear (before applying topical products such as chlorhexidine, antibiotics and synthetic antimicrobial peptides) increases biofilm permeability. This then disintegrates, effectively overcoming resistance to the classical, antibacterial therapeutic approach.



# Tris-NAC<sup>®</sup>



*Tris-NAC is an ear and skin flush containing two highly synergistic and innovative active substances that break down bacterial and fungal biofilms. Tris-EDTA has an antibacterial action and helps prevent the formation of new biofilm, while N-Acetylcysteine breaks down existing biofilm. It can be used before applying medicated drops when bacterial resistance is a concern. Tris-NAC can be used in conjunction with Otodine<sup>®</sup> and products from the Peptivet range to help manage ear cases. Clean the ear first with Otodine. For use in dogs and cats. Clinically proven and Dermatologist recommended.*

## Ingredients:

- Tris-EDTA
- N-acetylcysteine

## Instructions for use in ears:

- Clean the ears with Otodine
- Using the syringe provided apply the correct volume by size (small dogs / cat 1ml, medium dog 3ml large dog 5ml)
- Massage the base of the ear and allow the product to sit in the ear canal for 5-10 minutes.
- Wipe away any excess with a cotton pad
- Apply the selected antibiotic
- Repeat daily for two weeks before rechecking. Continue for 2 weeks

## Instructions for use on the skin:

- Syringe the solution directly onto the skin as required or
- Apply the solution to a gauze and place on to the affected area for 10 minutes
- Apply topical treatment afterwards



# Tris-NAC<sup>®</sup>



Instruction for mixing the solution:

- Remove lid A from the bottle
- The NAC powder is in cap B. Remove the protective film from the cap
- Screw cap B onto the bottle and press down until you hear a click. This releases the NAC powder into the bottle
- Shake the bottle well to mix the solution
- Product is stable for 50 days once mixed



1 • Unscrew cap A from the bottle



2 • Remove the silver film from cap B



3 • Insert cap B and tightly screw into place



4 • Fully press the top of cap B



5 • Shake the bottle well



6 • Use syringe C to withdraw the solution and subsequently apply the product



# Clinical Evidence



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## **In vitro antimicrobial activity of seven adjuvants against common pathogens associated with canine otitis externa**

Wei Yee Chan\*, Manouchehr Khazandi\*, Elizabeth E. Hickey\*, Stephen W. Page†, Darren J. Trott\* and Peter B. Hill\*

Veterinary Dermatology 2018



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## **Tris-NAC® (Tris-EDTA + N-acetylcysteine) activity against biofilm production, an *in vitro* study**

N. MILANESI, G. GHIBAUDO, T. DELLA MURA



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## **Stability of the N-acetylcysteine (NAC) with Tris-EDTA solution and in combination with dexamethasone sodium phosphate in aqueous solution for 50 days**

Milanesi N. et al.



[CLICK HERE](#)

## **Role of the biofilm and therapeutic tools in infective otitis in the dog and cat**

G. Ghibaudo



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## **Clinical cases managed with the application of Tris NAC**

Various



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## **In vitro efficacy of N-acetylcysteine in combination with antimicrobial agents against *Pseudomonas aeruginosa* in canine otitis externa**

Youngmin Son, Seulgi Bae\*



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## **Biofilms**

Sue Paterson



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