

## usNeo™

- Antibacterial active
- Reduces the symptoms of blemished skin
- Protects against body odor
- Anti-Dandruff

### Description

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usNeo is an antibacterial cosmetic active derived from the alpine lichen usnea barbata. With an excellent efficacy against gram-positive bacteria (those that cause acne and body odor), usNeo can be used for a broad range of cosmetic applications while preserving the natural skin flora. The active ingredient in usNeo, usnic acid <sup>[1,2]</sup>, is also effectively treating the microbial cause of dandruff <sup>[1,2,3]</sup>.

- Preservative-free
- pH-neutral
- China INCI compliant
- Proven efficacy (*in vivo*, *in vitro*)

### INCI

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US. Propanediol, Usnea Barbata (Lichen) Extract, Tromethamine, Tetrasodium Glutamate Diacetate, Water, Sodium Hydroxide  
EU. Propanediol, Usnea Barbata Extract, Tromethamine, Tetrasodium Glutamate Diacetate, Aqua, Sodium Hydroxide

(Please refer to proprietary composition declaration for up-to-date INCI listing.)

### Recommended Applications & Use Levels

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- Deodorants (sticks, emulsions, pump sprays), antimicrobial deodorant bars and liquid soaps
- Skin care products for blemished, acneic and problem skin, foot care products and anti-odour products
- Anti-dandruff shampoos and related hair care products

Recommended use level: 1-2%

## Usnic Acid - *in vitro* Activity

(+)-Usnic acid is a natural compound that is uniquely found in several lichen species all over the world<sup>[1,2]</sup>. Due to its antibacterial<sup>[4,5,6,7,8]</sup> and anti-inflammatory<sup>[9,10]</sup> properties, lichen extracts with usnic acid have been used worldwide in traditional medicine and cosmetic applications.

Microorganism	ATCC / DSM N°	Comments	Minimum Inhibitory Concentration (MIC) of usNeo™
Staphylococcus aureus	ATCC 6538	Normal skin flora; causes skin infections	0.01-0.025%
Staphylococcus epidermidis	ATCC 12228	Normal skin flora; can cause internal infections	0.01-0.025%
Propionibacterium acnes	ATCC 6919	Causative organism of acne	0.1-0.25%
Corynebacterium jeikeium	DSM 7171	Causes body odour	0.01-0.025%
Corynebacterium xerosis	DSM 20743	Causes body odour	0.05-0.25%
Corynebacterium amycolatum	ATCC 49368	Causes body odour	0.01%
Streptococcus mutans	ATCC 25175	Causes dental caries	0.01-0.025%
Streptococcus faecalis	ATCC 19433	Faecal contaminant	0.01-0.025%
Candida albicans	ATCC 10231	Yeast, gut flora; causes skin infections	0.05%

## Activity against Body Odor

A clinical study with 20 volunteers revealed an excellent efficacy against body odor. After 24 hours a formulation containing 2% usNeo resulted in a 32% reduction in underarm odor compared to the control. The study showed also a superior efficacy in comparison to benchmark systems with triclosan and ethyl hexyl glycerol (Fig. 1) while preserving the natural skin flora.

2% usNeo shows the lowest overall bacterial reduction of skin flora compared to the competitive deodorant actives tested (Fig. 2) while having the best results in the Sniff Test.

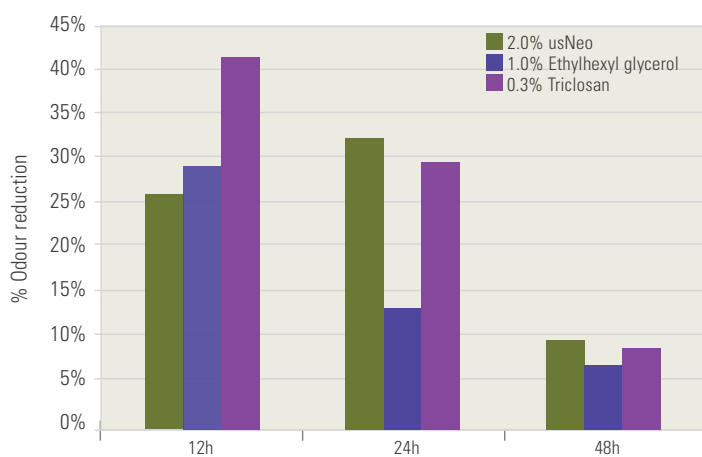


Fig. 1 Comparative efficacy of deodorant actives

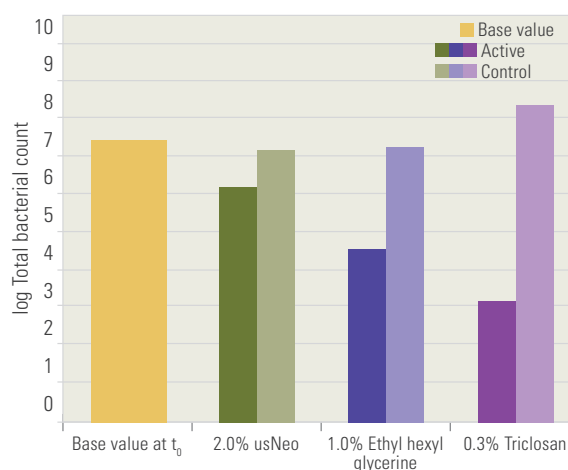
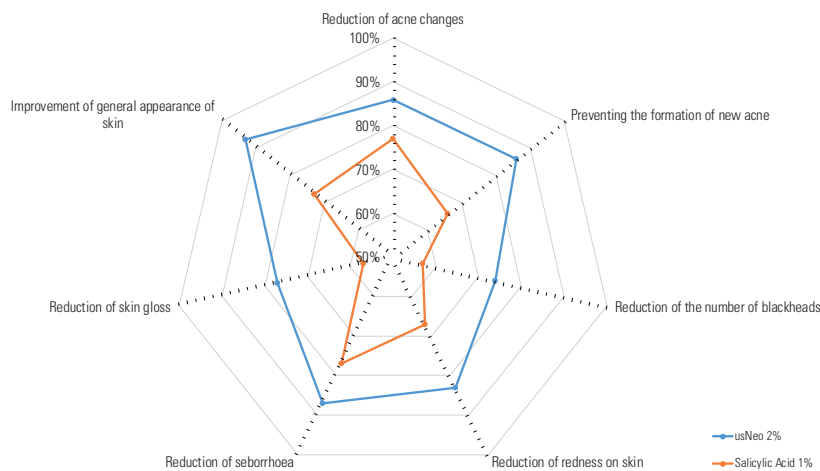


Fig. 2 Effect of deodorant actives on total bacterial skin flora 24 hours after application

- **Treatment** 5 days, repetitive daily application, left and right axilla (arm pit), randomized. Showering allowed with skin pH neutral soap
- **Method** Sniff test. Olfactory expert grading of the intensity of under arm sweat odor was carried out
- **Assessment** Under arm swabs were taken at  $t_0$  and at 24 hours from 10 of the 20 volunteers to quantify aerobic and anaerobic underarm population. The determination of total bacterial counts enabled the effect of the deodorant actives on normal skin flora to be evaluated

## Activity against Blemished Skin

The efficacy of a formulation with usNeo (2%) was tested against a benchmark system with salicylic acid. An *in vivo* study with 2 x 30 volunteers was followed by a customer survey (questionnaire), stating a very high effectiveness of usNeo against signs of acneic skin.



- Test Design: 2 x 30 volunteers showing signs of acneic skin
- Treatment: Application to the face for 3 weeks, 2 times a day
- Test Formulations: Cream formulation with 2% usNeo  
Cream formulation containing 1% salicylic acid (benchmark system)

## Activity against dandruff

A clinical study with 30 volunteers revealed an excellent efficacy against dandruff. After 28 days of usage of a shampoo containing 2% usNeo resulted in an average dandruff reduction of 69.5% compared to the control. The best result observed was a dandruff reduction of 100%. A subjective evaluation was performed with a questionnaire regarding acceptability, tolerance and efficacy.

- Study participants were very satisfied with the test shampoo containing 2% usNeo.
- 85.7% of the test persons said they would like to continue using the product and would also recommend it to others.
- After 28 days of application participants noticed a decrease in dandruff (71.4%), a soothing effect (78.6%) and an overall cleaner appearance (78.6%).

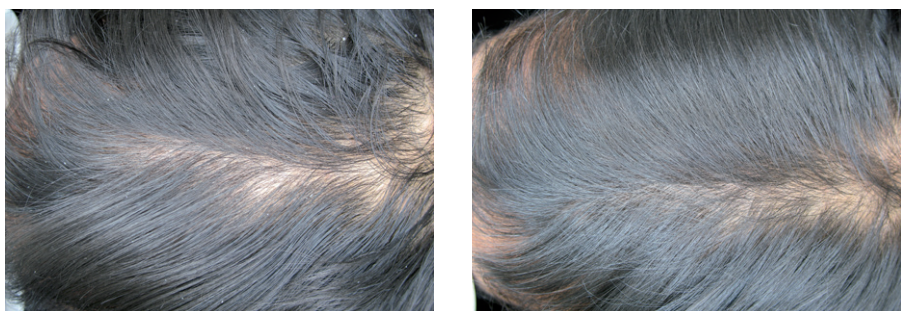


Fig. 3 Top of the head before the test shampoo application (left) and 28 days after

- Test Design 30 volunteers, products coded (blind study), Group I used shampoo containing 2% usNeo  
Group II used shampoo without active (placebo)
- Treatment 28 days, 3 times per week
- Method High resolution macrophotography (Visioface) of the top of the head before and after treatment, followed by visual scalp assessment to calculate the total dandruff severity score (TDSS) = Total percent involvement x Total severity score

## Safety & Regulatory

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### Toxicology:

- Not phototoxic (according to OECD guideline N° 432)
- Not mutagenic using AMES test (according to OECD guideline N° 471)
- Not skin irritating (using epicutaneous test for assessment of skin irritating potential)
- No allergens (as per current EU Cosmetic Regulation)
- Moderately irritating for eyes (HET CAM), when tested at a concentration of 5.5%. Considerations should be given to include 'Avoid eye contact' or equivalent in the instruction for use of the final cosmetic product, if applicable.

## Compliance

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- Compliant with the EU Cosmetic Regulation (EC) No 1223/2009
- Compliant with the REACH Regulation (EC) No 1907/2006
- China INCI compliant
- Not tested on animals
- Usnic acid is not on the List of Approved Preservatives of the EU Cosmetic Regulation

## References

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