Rona

RonaCare® Allantoin

The Skin Care Ingredient

EMD

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For at least a century, maggots and comfrey roots have been used with some considerable success in medicine. In 1912 in England, Macalister found out that the active ingredient of the comfrey root is allantoin. In 1935, Robinson discovered that allantoin is also the main active component in the excretion of maggots.[1, 8, 9, 12, 16]

In nature, allantoin is present in the livers of animals, in fetuses, in trace amounts in human urine, somewhat more in the urine of pregnant women and in various plants. It is the main product of purine metabolism.[8, 12, 16]

Efficacy [8, 12, 13, 14]

The treatment of wounds using allantoin is a complex procedure: first the wound area is cleansed by removing undesirable necrotic or scaly tissue; rapid regeneration of tissue follows due to cell-proliferation promoted by the allantoin. It is enhanced by a certain continuous soothing effect which helps to restore the normal function of the surface treated. In most cases relief from pain is felt soon after the initial application of allantoin. It is assumed that the effect produced by allantoin is due to the stimulation of leucocytosis (local leucocytic effect)[9, 12]. When used on intact facial and body skin, allantoin produces a silky, smooth and healthy appearance.

Use of only 0.2 % allantoin has the same keratolytic effect as 10 - 20 % of urea; however, there are no harmful side effects such as irritations.

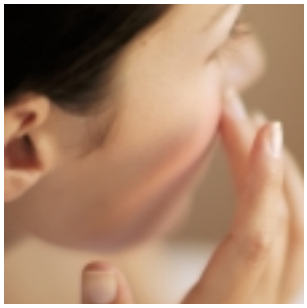
The following in-vivo and in-vitro studies mentioned in the literature confirm the efficacy of allantoin:

· Blank: keratolytic action -> very good influence on skin moisture[2]
· B.E. Brush and C.R. Lam: soothing and detoxifying action (using a sulfonamide-allantoin compound in an ointment tested on animals)[3]
· P. Flesch: skin penetration detected by colorometry using an in-vivo human skin model[6]
· P. Flesch: measurement of the release of sulphydryl groups demonstrates the dispersive power of allantoin on proteins as well as its keratolytic activity[7]
· Le Van et al.: significant soothing and healing action of a hand lotion containing allantoin on 109 housewives suffering from badly damaged skin[15]

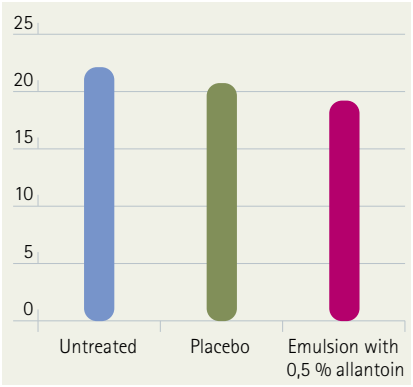
Efficacy studies

Efficacy studies performed by Merck KGaA, Darmstadt in 1998 have confirmed the properties of allantoin mentioned in the literature with respect to:

· **Cell proliferation**
· **Soothing effect**
· **Moisturizing effect**



Cell proliferation



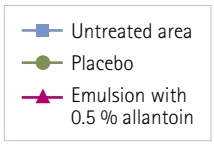
Cell proliferation time is decreased significantly when the skin is treated with a cream containing 0.5 % allantoin (evaluation using a fluorescence method).

20 volunteers, 18-33 years, female, application over a period of 25 days, twice a day on the volar forearm

Soothing and moisturizing effect

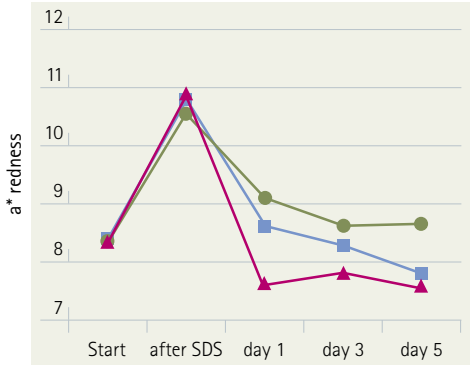
Subsequent to chemically induced irritation by tensides (sodium dodecyl sulfate = SDS) and mechanically induced irritation by tape stripping, skin redness (chromametry) as well as transepidermal water loss (TEWL) were measured.

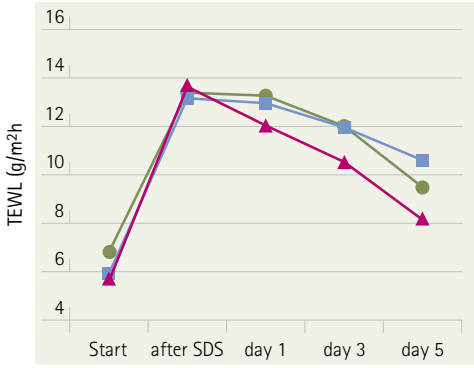
In both cases of irritation, the significant decrease of skin redness and transepidermal water loss confirm the soothing effect of the cream containing 0.5 % allantoin. The decrease of transepidermal water loss alone confirms the moisturizing effect of allantoin.



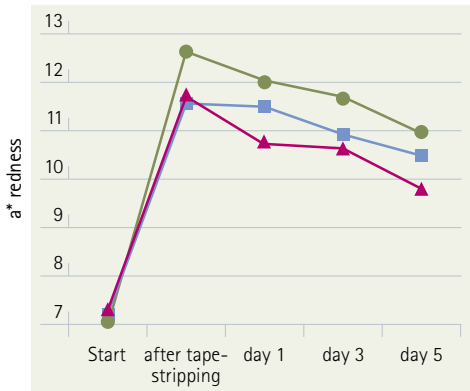
20 volunteers, 18-35 years, female, application over a period of 25 days, twice a day on volar forearm

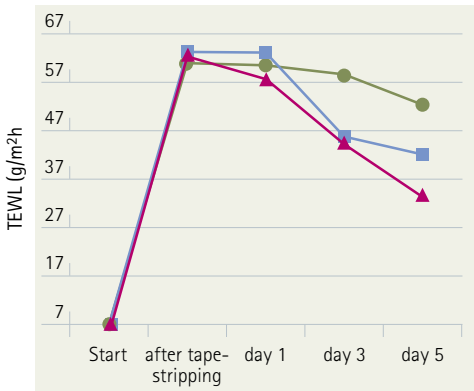
Chemically induced irritation





Mechanically induced irritation





20 volunteers, 19-39 years, female, application over a period of 25 days, twice a day on volar forearm

Applications

The main pharmacological effect of allantoin is the powerful stimulation of cell proliferation and the enhancement of the rebuilding of intact granulation tissue. In pharmaceutical applications, allantoin is used e.g. in the treatment of ulcers, slow-healing wounds and burns. The therapeutic properties are particularly effective when used as a topical agent.

In cosmetics, allantoin is used as an adjunct in numerous preparations, where it enhances soothing, cleansing and healing action. In addition, it has the advantages of being non-toxic, non-irritating and effective in low concentrations.

In hair care, the keratolytic action of allantoin (0.2 to 0.5 %) is useful for breaking up dandruff scales. The amphoteric character of allantoin has a substantive effect on skin and hair, which prolongs keratolytic activity.

Suggested formulations & use level

After shave formulations[10]	0.2 %
Soaps & shaving creams[10]	0.15 - 0.2 %
Hair tonic[10]	0.2 %
Eye care[10]	0.2 %
Oral Care[10]	0.05 - 0.2 %
Antiperspirants[10]	0.1 - 0.5 %
Face & body care, sun care[10]	0.1 - 0.2 %
After sun[10]	0.5 %
Baby care[10]	0.2 - 0.5 %
Lip care & make-up[10]	0.1 %
Foot care[10]	0.2 %
Wipes	0.2 %

Formulation guidelines

· Use level about 0.1 - 0.5 %
· Dissolve Allantoin in the aqueous phase of an emulsion
· Compatible with most cosmetic ingredients

Technical data

Molecular structure

INCI Name	Allantoin
Synonym	5-Ureidohydantoin
Solubility (25 °C)	water (0.6 %), ethanol (0.04 %), propylene gycol (0.3 %)
Stability	Under normal storage conditions, allantoin is stable in water-free formulations. Aqueous formulations are stable over a pH range of 4 to 9. On being heated to 80 °C for one hour, a 0.5 % aqueous solution shows no changes. However, allantoin is decomposed by prolonged boiling of the aqueous solution as well as by strong alkalis.

Combination of Allantoin with Aluminum Salts

The use of aluminum salts in cosmetics often causes skin irritation and sensitization. Allantoin serves to overcome or substantially minimize the irritant potential of various compounds. The combination of aluminum salts and allantoin thus combines the astringent and bacteriostatic action of the aluminum with the healing, keratolytic and anti-irritant properties of allantoin. As a result, no irritation or sensitization is caused by the aluminum salts.[10, 15]

RonaCare® Aluminum Chloride Hydroxide – Allantoin	
INCI Name	Aluminum Chlorohydrate, Allantoin, Aqua (Water)
Solubility (20 °C)	water (1.3 %), ethanol 50 % (0.8 %)
Special benefits	Mild astringent
Suggested formulations & use level	Acne preparations (0.5 - 2 %), mouthwashes (0.1 - 0.2 %), after-shave preparations (0.2 %), antiperspirants & deodorants (0.2 - 0.5 %)

RonaCare® Aluminum Hydroxide – Allantoin	
INCI Name	Allantoin, Aluminum Hydroxide, Aqua (Water)
Solubility	Insoluble in water, ethanol and oils
Special benefits	Binds acid and ammonia -> prevents diaper-dermatitis
Suggested formulations & use level	Acne preparations (0.2 - 0.4 %), dental creams (0.1 - 2 %), baby care products (0.2 - 0.3 %), soaps and shaving creams (0.1 - 0.2 %), lipsticks & make up (0.1 - 0.2 %)

Ordering Information

Item No.	*Name*	*Pack Sizes*
101015	RonaCare® Allantoin	5 kg, 25 kg
101072	RonaCare® Aluminum Chloride Hydroxide - Allantoin	1 kg, 25 kg
101074	RonaCare® Aluminum Hydroxide - Allantoin	1 kg, 25 kg

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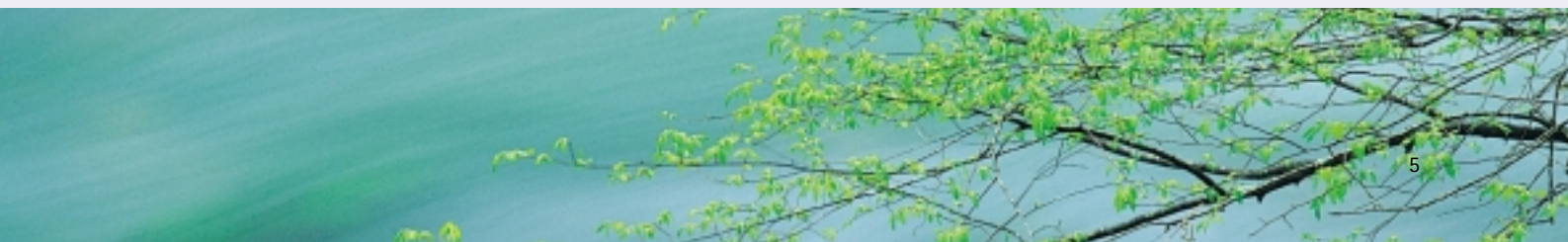

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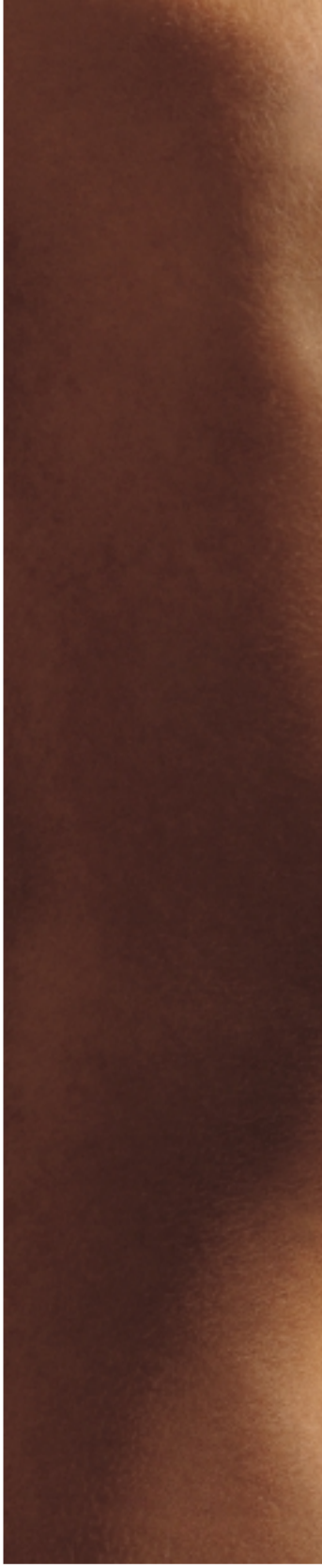

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