

A new skin care approach for acne prone skin

S. Conzelmann, B. Traupe, R. I. Peirano, T. Schläger, F. Rippke and G. Neufang
Beiersdorf AG, Hamburg, Germany

Introduction

Seborrhea, comedones, as well as inflammatory lesions like papules, pustules and nodules, are the main characteristics of acne prone skin. With more than 90% prevalence in puberty, acne vulgaris is one of the most common skin diseases. To provide optimum skin care for acne prone skin, it is important to address the multiple factors contributing to this skin condition. Besides an enhanced sebum production, inflammation and infection with *p. acnes* promote the manifestation of acne symptoms.

To alleviate the symptoms of acne prone skin, 3 actives targeting these factors were combined:

The natural anti-inflammatory dermocosmetic active Licochalcone A, anti-bacterial 1,2-Decanediol and sebum regulating L-Carnitine.

The specific efficacy of all actives was tested *in vitro* on human skin cells as well as in *in vivo* studies. The combination of the three actives was assessed in a dermatological study.



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Results

Licochalcone A

Licochalcone A (LicA) is a chalcone extracted from *Glycyrrhiza inflata* (chinese licoriche) roots. It displays a broad and unique anti-inflammatory and anti-oxidative profile *in vitro* and *in vivo*.

In vitro:

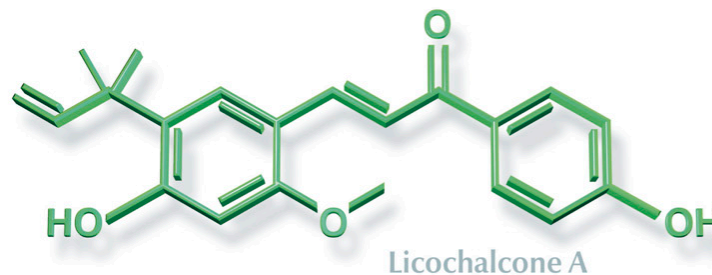
Anti-inflammatory efficacy proven in different cellular assays:

- inhibits release of pro-inflammatory eicosanoids and cytokines like PGE₂ and LTB₄ as well as TNF α and IL₆.
- minimizes oxidative burst reaction of granulocytes
- induces expression of Nrf2-dependent cytoprotective enzymes in fibroblasts and inhibits NF κ B activation.

In vivo:

Proven clinical efficacy in acute and chronic inflammatory skin conditions:

- calmes skin irritations and reduces redness
- protects skin from sun damage and soothes sun burn erythema
- reduces facial redness in rosacea patients
- shows a high efficacy and skin tolerability in atopic dermatitis



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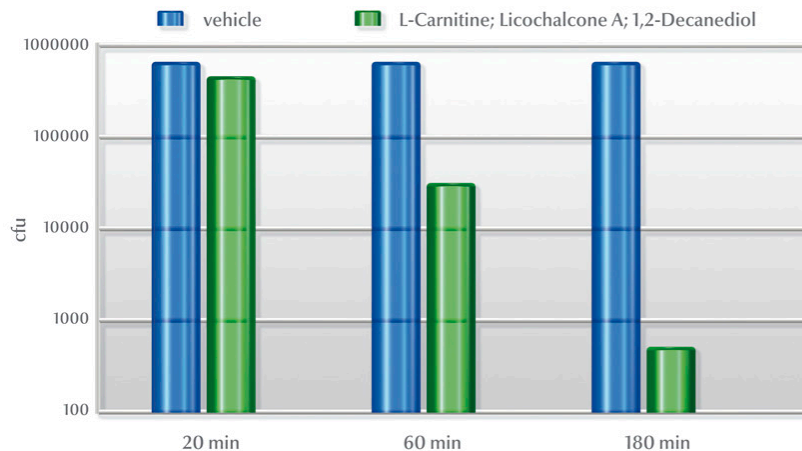
Results

1,2-Decanediol

1,2-Decanediol provides excellent antimicrobial activity.

In vitro:

1,2-Decanediol shows significant antimicrobial efficacy over time. In this test design, *p. acnes* colonies were treated either with vehicle or verum for 20, 60 or 180 minutes. After treating, *p. acnes* were plated on agarplates and cultivated for 5 days before colonies were counted.



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Results

L-Carnitine

The body own's amino acid L-Carnitine regulates sebum production in the skin by promoting the metabolism of fatty acids in sebocytes mitochondria.

In vitro (fig. 1):

L-Carnitine reduces the intracellular lipid content in sebocytes. A lipid assay with the Nile red dye was utilized to determine changes in the intracellular lipid content after incubation with L-Carnitine for 5 days. The results show that 0.5% L-Carnitine reduces the amount of lipids stored in SZ95 sebocytes by 38%.

In vivo (fig. 2):

Sebum reduction was assessed after treatment with a cosmetic formulation containing L-Carnitine. To determine if L-Carnitine exhibits sebum reducing characteristics, 21 female volunteers (aged 22 to 56 years) with oily and shiny facial skin were enrolled in a controlled, randomized study. Volunteers applied a cosmetic formulation containing 2% L-Carnitine or the respective vehicle in a split-face design twice daily (morning and evening) for a period of 3 weeks on the face. The results show that after 3 weeks of treatment, L-Carnitine significantly decreased the sebum secretion score compared to the vehicle control.

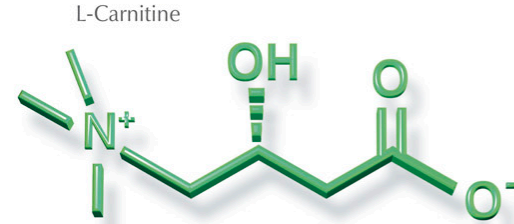


Fig.1: Intracellular lipid content

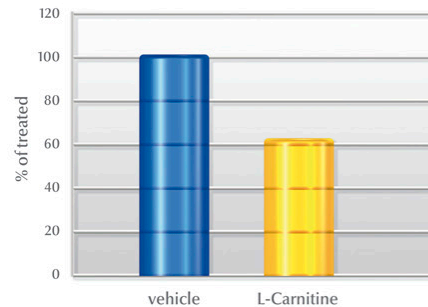
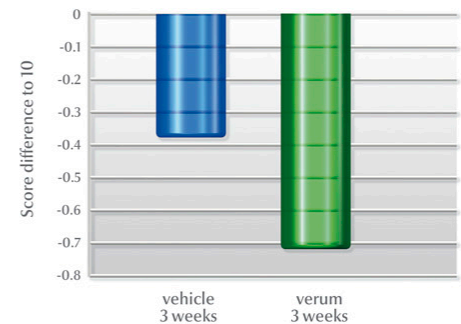


Fig.2: Sebum secretion rate



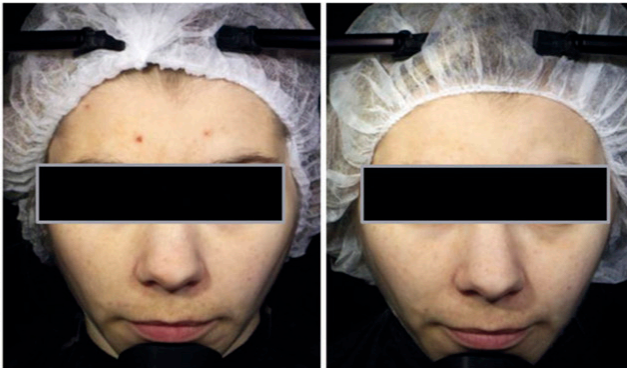
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Dermatological Study

Study design:

In this *in vivo* study 50 volunteers were randomized into a verum- and a vehicle group. The verum group creamed their faces with a day care formulation containing Licochalcone A, L-Carnitine, Hydroxycitrate and 1,2-Decanediol for 12 weeks. The vehicle group applied a cream without the above mentioned active ingredients.



Start

12 weeks

Results:

- Significant reduction of acne scores expert grading was seen between groups and in the verum group over time.
- Self-assessment of photographs showed a significant effect of verum group over time.
- **The verum application yielded visible improvement of acne prone skin.**

Conclusion

The combination of anti-inflammatory Licochalcone A, sebum regulating L-Carnitine, anti-bacterial 1,2-Decanediol provides an effective dermocosmetic skin care for acne prone skin. To support the beneficial effects, a combinatory application of a lactic acid containing night cream is recommendable: Lactic acid, an alpha-hydroxy acid, displays keratolytic and water-binding efficacy. Thus it not only provides moisture to the skin but also counteracts the formation of comedones and prepares the skin for an optimal follicular absorption of actives.

Regulating sebum production, calming inflammation, decreasing bacterial infection and keratolytic efficacy are the 4 pivotal factors for dermocosmetic skin care for acne prone skin.