Global assessment of the effect of a topical treatment on stretch marks

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Introduction

Stretch marks are a well-recognized, common skin condition that rarely cause any significant medical problems but are often a significant source of distress to those affected. Common during pregnancy (70-90%), stretch marks are the result of many factors: hormonal impact, mechanical and physiological stress. Firstly, inflammatory responses are significant with formation of dermal edema and afterward, an epidermal atrophy and thinning are observed. Finally, these lesions look like atrophied scars.

We investigated efficacy of a cream specifically formulated to reduce stretch marks by the way of *in vitro* models and clinical study. This cream contains patented natural ingredients: lupeol, natural biopeptides and arabinogalactane that have complementary effects on factors triggering stretch marks.

Global action of active ingredients: *in vitro* studies

The specific action of active ingredients on ECM remodelling and inflammatory response

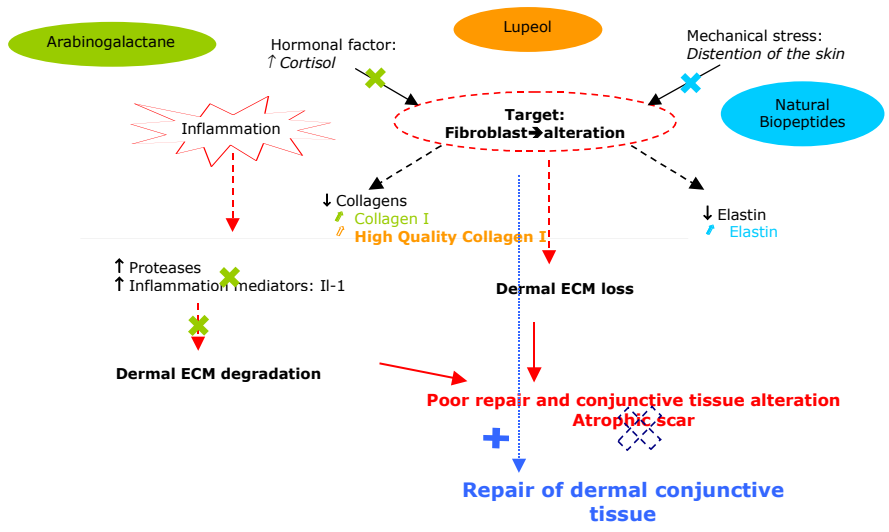
Three natural ingredients have been evaluated at cellular levels and demonstrated potential activity to reinforce and remodel dermal extracellular matrix and to fight against inflammation, mechanical stress and hormonal deleterious environment.

Lupeol, natural biopeptides and arabinogalactane have complementary effects on factors triggering stretch marks.

Table 1: Cellular and molecular activity of Lupeol, Arabinogalactane and Natural biopeptides

Ingredients	*Cell models*	Results
Lupeol	*Fibroblasts (QPCR, Immunofluorescence staining, western blot, ELISA)*	21% induction of HSP47 gene expression 4 times increase of Collagen I protein synthesis
	Stretch marks fibroblasts in collagen lattices (Contractile forces-GlaSbox®)	3 times decrease of contractile forces
Arabinogalactane	*Fibroblasts + hydrocortisone (QPCR)*	37% restoration of Collagen I gene expression in deleterious hormonal context
	Keratinocytes + PMA (ELISA	21% decrease of IL1β protein release
Natural biopeptides	*Fibroblasts (ELISA, tritiated proline incorporation)*	34% and 60% stimulation of elastin and collagens neo-synthesis
	Stretch marks fibroblasts in collagen lattices (Contractile forces/GlaSbox®)	Decrease of contractile forces

Figure 1: Diagram summarizing the action of 3 active ingredients on stretch marks pathogenesis



Global action of active ingredients on dermal injury model mimicking stretch mark

A dermal injury model that mimics ECM changes as they occur in the stretch marks formation was conduced on *in vitro* reconstructed full-thickness skin (phenion). Topical application of a cream containing these specific ingredients has been performed at the starting day after injury. Gene expression of collagen I, VII, elastin, integrin β1 has been analyzed by QRT-PCR. ImmunoHistochemistry for integrin β1 was also conduced.

The topical treatment **significantly upregulated collagen I and VII, integrin β1 and elastin** gene expression. This effect has been increased until day 16 for collagen VII and integrin β1. Moreover, product topical application on skin injured-model **strongly induced production of integrin β1 protein.**

The ingredients combination counteracts alteration at DEJ and ECM levels and promotes tissue regeneration and remodelling

Figure 2: Gene expression of collagen I, VII, integrin 1 and elastin in dermal injured-model

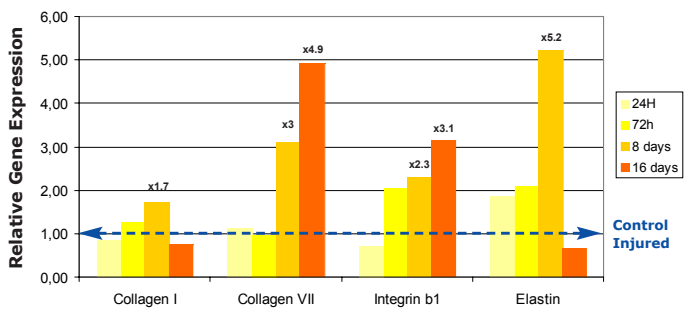
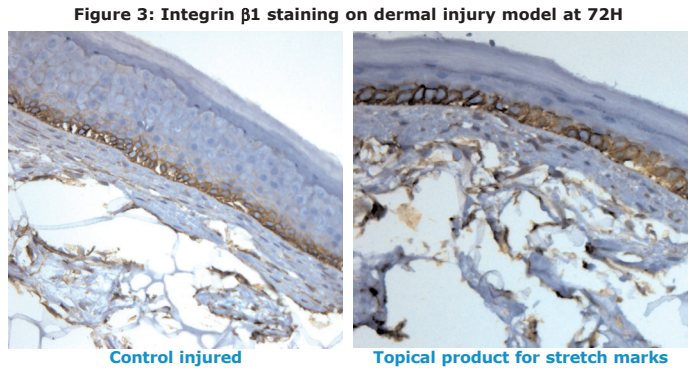


Figure 3: Integrin β1 staining on dermal injury model at 72H



Control injured — Topical product for stretch marks

Global activity on stretch marks: Clinical Study

Protocol

In a simple-blind, randomised, intra-individual comparative study, 22 post-partum women presenting symmetrical and comparable recent stretch marks (state I on Deprez-Adatto classification) on each of their thighs or hips at the baseline, applied the cream with soft circular massages twice a day on one of their thighs during 3 months. The other thigh served as the untreated control. Each thigh was evaluated monthly by clinical examinations and by instrumental measurement. Women also applied the cream on all areas concerned by stretch marks in order to obtain a global evaluation of the efficiency. Women included in the study had a normal BMI (19 and 25 kg.m^{-2}) and were between 18 and 40 years old. The significance level was set at 5% (Student test and Wilcoxon test).

Results after 84 days

Clinical evaluation of global skin parameters and erythema

Figure 4 : Evolution of skin parameters

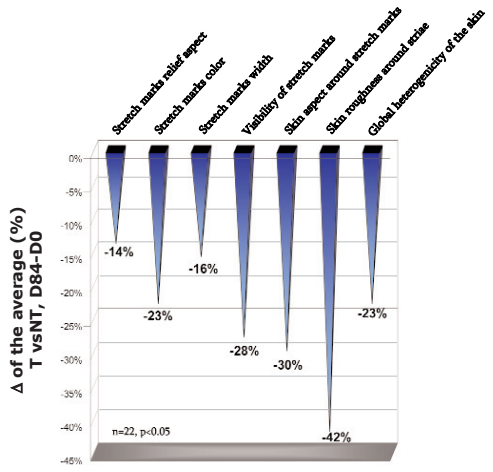


Figure 5 : Evolution of stretch marks global erythema

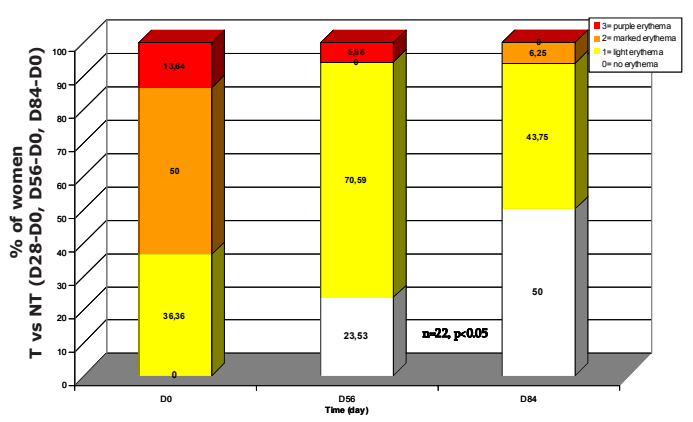
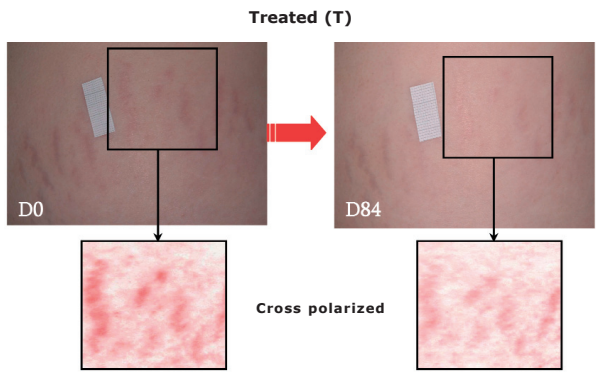


Figure 6 :
Standardized photographs: evaluation of the erythemal component



After 84 days of application, all parameters evaluated by the clinician were statistically improved. Moreover, a visible reduction of the erythemal component of stretch marks was observed. Globally, the clinician observed a significant global improvement for 100% of the subjects: 31% presented an important improvement and 69% an average improvement. **Since D56, centimetric measurements of stretch marks showed a significant reduction of width and length, respectively -12% and - 17 % compared to the untreated control.**

Conclusion

The *in vitro* results demonstrate the wound healing efficacy of the ingredients combination to counteract ECM alteration and to promote tissue regeneration, supporting the cosmetic relevance of this cream for the management of stretch marks.
The clinical data demonstrate the efficacy of the topical cream on clinical appearance of early, active stretch marks in post-partum women with a significant global improvement of the severity of stretch marks. In addition, the action of the cream was not limited to stretch marks and proved to be effective in improving global skin quality. Women highly appreciated the cream for its efficiency: 100% observed an improvement of stretch marks color and 88% would like to go on the use of the cream. The product was well tolerated. No adverse reaction was reported during the study.

References

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