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# Addressing Hyperpigmentation in Melanated Skin

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## Introduction of research

Hyperpigmentation disorders are of cosmetic and social concern to many individual and can arise in all skin types but more frequently affects dark and brown skin. Hyperpigmentation can be caused by various stimuli such as aging or acne and is mainly characterized by increased melanin synthesis and deposition. As these pigmentary changes can occur with greater frequency and severity in darker skin population, it can have a significant psychosocial impact, on these populations [(1)].

However, today, consumers worldwide feel underserved by beauty brands because there are very few skincare solutions for hyperpigmentation disorders and specifically for melanated skin. We sought to fill this gap for personalized and inclusive cosmetics by evaluating the benefit of a botanical blend based on Saxifraga, Papaya and Guava extracts, on both age and acne-based hyperpigmented spots.

## Methods and Results

Innovative *in vitro* models mimicking either age or acne-induced hyperpigmented skin conditions were developed. To mimic hyperpigmentation due to aging, specific mediators were added (endothelin-1 and Keratinocytes Growth Factor[(2,3)]) in a model with iPS-derived dark melanocytes to measure tyrosinase activity, and in a coculture model of keratinocytes and dark pigmented melanocytes to measure melanin content. To mimic hyperpigmentation due to acne, we used oleic acid, a free fatty acid found in higher amounts in the sebum of acne subjects and add it first in keratinocyte medium to measure the release of IL1-alpha and then in a coculture model made of keratinocytes and dark pigmented melanocytes to measure melanin content. In these models, our botanical blend demonstrated a decrease in tyrosinase activity, melanin content and IL1a release (Figure 1).

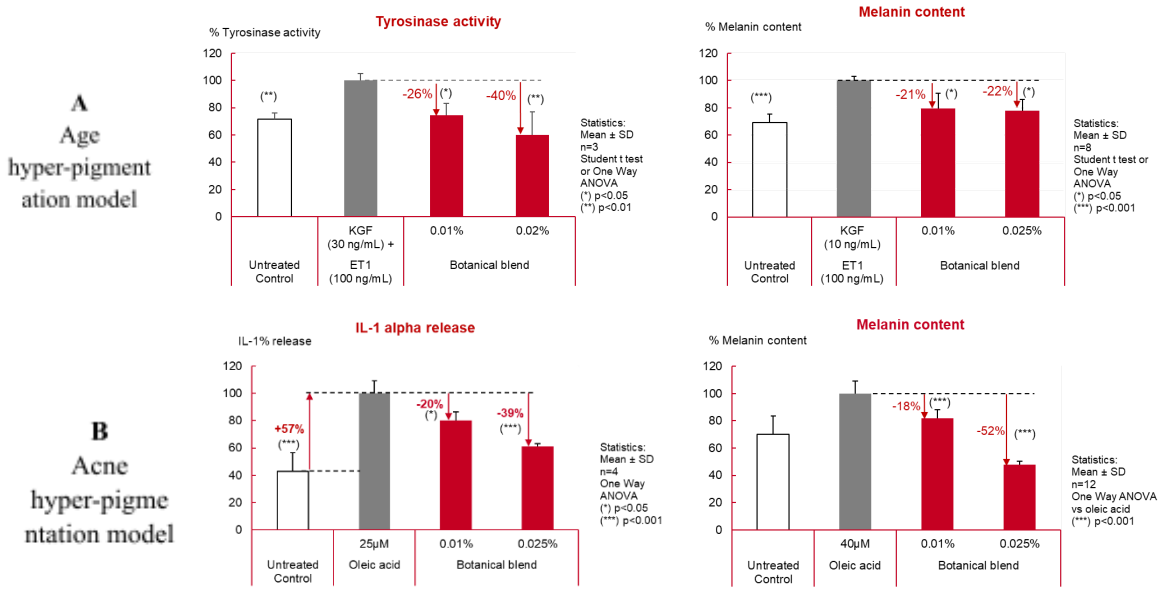
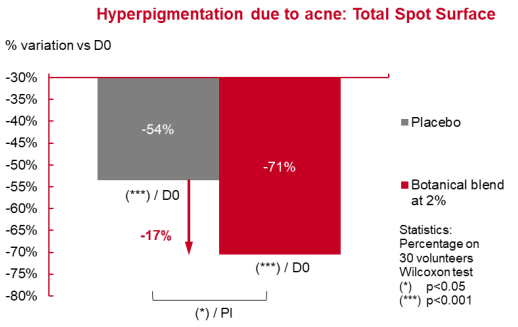
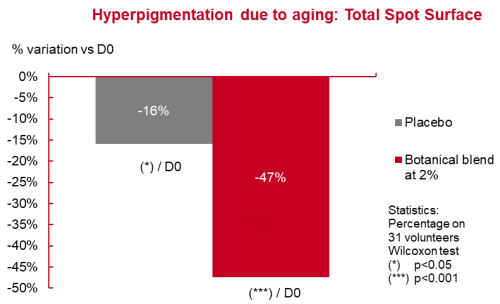


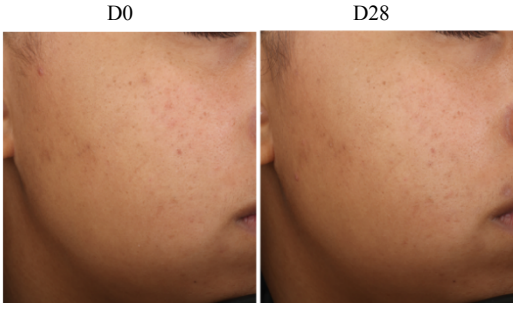

**Figure 1: Effect of botanical blend on age (A) and acne hyperpigmentation *invitro* model (B)**

*In vivo* tests were performed to confirm the botanical blend activity regarding hyperpigmentation To validate its performance on each class of hyperpigmented spots, we tested our botanical blend, in Brazil, at 2% for 28 days on 2 different groups of female volunteers with dark phototype. The first group included 18-30 years old women of skin phototypes 4-5 affected by brown spots due to acne-; the second included 40-59 years old women of skin phototypes 3-6 presenting visible hyperpigmented spots due to age.

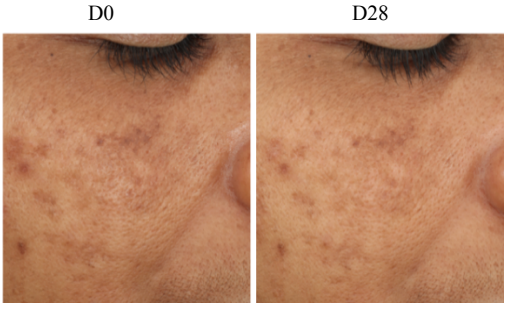
We showed in figure 2 that for acne-induced hyperpigmentation the botanical blend significantly reduced the surface of total spot by 71% versus baseline and improved the reduction of the total spot surface by 17% vs placebo. For age-induced hyperpigmented spots, our blend significantly reduced by 47% the surface of the spots vs baseline. Moreover, both groups also perceived their skin as more radiant, moisturized, and homogeneous with lesser and smaller dark spots.




A- Hyperpigmentation due to acne




B- Hyperpigmentation spot due to aging

**Figure 2:** *In vivo* results on dark skin hyperpigmentation disorder due to acne (A) or aging (B)

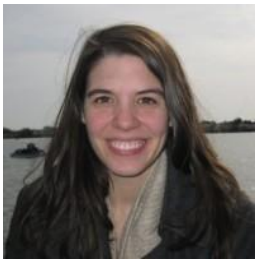
## Conclusion

Innovative *in vitro* models were developed to closely mimic the environment of the skin prone to hyperpigmented spots due to aging or acne allowing to demonstrate the performance of the botanical blend on different specific endpoints related to hyperpigmentation. Moreover, the clinical results demonstrated the efficacy of the blend which could be used to improve the appearance of dark skin hyperpigmentation. Our blend is thus a specific solution suitable for dark skin tones more predisposed to hyperpigmentation disorders.

## References

(1) Davis *et al,* J Clin Aesthet Dermatol. 2010;3:20-31
(2) Hirobe *et al,* Journal of Dermatological Science. 2013, 71, 45-57.
(3) Murase *et al*, Biology Open. 2015, 4, 1213-1221

**About the speaker**



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Technical sales specialist for bio-active ingredients with 10 years of experience in early stage bioscience R&D, project management, and method development.