EVALUATION OF THE RELEASE OF A BIO-CELLULOSE MASK’S ACTIVE INGREDIENTS ON TO A SUPPORT AND THE CLINICAL EVALUATION OF ITS EFFICIENCY WHEN USED IN COMBINATION WITH A DEPIGMENTATION SERUM

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Introduction
After having demonstrated the performance of a depigmentation serum, the aim of this study is to show faster and more dramatic results, when combining on a support a serum and a bio-cellulose mask, containing the same depigmentation active ingredients.
For this, we have shown the release of depigmentation active ingredients impregnated in a bio-cellulose mask on to human living skin explants and we have evaluated the efficiency of a serum alone against this same serum in combination with the bio-cellulose mask, on a panel of 20 female volunteers.

Material and Methods
1- Ex vivo study and bioavailability
Human living skin explants were obtained from the abdomen of a healthy Caucasian woman who had undergone aesthetic surgery. The explants were kept in survival in BEM culture medium (BIO-EC’s Explants Medium) at 37°C in a humid, 5%-CO2 atmosphere. On day 0, the bio-cellulose mask was cut into an 8 mm diameter disc. The fluorescein isothiocyanate (FITC) product incorporated in the depigmenting active ingredients was deposited on the disc and applied topically on human living skin explants for 10 minutes. After 6h, 12h and 24h of survival, the explants were frozen at -80°C, cut into 7μm-thick sections and observed using an epifluorescence microscope.

2- Clinical study
20 Korean women with dull skin and hyperpigmented spots on their face were recruited. They applied the serum to their entire face twice a day for 6 weeks. The moist bio-cellulose mask was applied once a week on only one half of their face for 5 weeks.

The efficiency of the serum used alone and the serum used in combination with the bio-cellulose mask was evaluated using 3 complementary techniques:
- The SIAscope, which involves using a non-invasive method to quickly measure the level of melanin in the skin.
- The Fontana-Masson method, which visualises melanin by stripping tape off the skin’s surface.
- The clinical scoring method to evaluate performance according to several criteria.

Results
1. Ex vivo study and bioavailability: fluorescein fluorescence on human skin explants

- 6 hours after the application of the bio-cellulose mask, the fluorescence was very strong on the stratum corneum (SC)’s surface, very clear in the SC, moderate to quite clear in the epidermis and weak in the papillary dermis (PD).
- Note that the control T0 present only a very low autofluorescence on elastic fibres of the PD.

- 12 hours and 24 hours after the application of the bio-cellulose mask, fluorescence was comparable to that observed after 6 hours.

2. Clinical study:

- The SIAscope
- The Fontana-Masson method in D-squames

- After 6 weeks of using the serum alone, 35% of the volunteers showed a reduction in melanin intensity within corneocytes.
- The consecutive use of the serum in combination with the bio-cellulose mask for 5 weeks induced a reduction in melanin intensity in 47% of the volunteers.

Conclusion
This entire study shows the release of fluorescein from the bio-cellulose mask, from 6 hours after the application of the tested product, to the different layers of the skin; the epidermis represents 50% of the impregnation of the stratum corneum.
Moreover, the clinical evaluation shows the serum alone or the serum in combination with the bio-cellulose mask significantly reduce melanin levels after only 5-6 weeks of use. Also, the study demonstrates that the use of the bio-cellulose mask on a support boosts the serum’s depigmentation action.

References