

The mechanism of action of Phytoene applied to
dermocosmetic now determined and promoted at the
NYSCC Suppliers' day

- **DEINOVE has developed a unique bioproduction process that leads to the first 100% pure Phytoene with an anti-aging action which mechanism of action has been discovered and reveals a target of choice in cell regeneration.**
- **Solvay promoted these new data to cosmetic customers at the annual congress of the New York Society of Cosmetic Chemists (NYSCC). A worldwide leader in specialty ingredients for Personal Care applications, Solvay markets this asset in North America and Asia on an exclusive basis under the ReGeN-oPhyt® brand.**
- **Progress in the marketing of the asset is now tangible: several tens of clients have been sampled worldwide. The outlooks for revenues in 2019 are reaffirmed, as well as a future potential of several tons per year.**

DEINOVE (Euronext Growth Paris: ALDEI), a French biotech company that uses a disruptive approach to develop innovative antibiotics and bio-based active ingredients for cosmetics and nutrition, **announced that its partner Solvay presented the innovative Phytoene mechanism of cell regeneration at the 40th annual congress of the NYSCC (07 - 08 May 2019 | New York, US). Extensive studies have discovered that Phytoene acts on laminin, one of the main components of the basal blade, the junction layer between the dermis and the epidermis.**

Complementary proteomic studies conducted by DEINOVE have shown that Phytoene stimulates laminin production. Laminins are major protein components of the basal lamina, just like collagen. The basal blade is the junction between the epidermis and the dermis. The role of laminin in maintaining skin health - maintaining cell structure, communication between dermis and epidermis, release of repair substances - has been demonstrated several times¹, placing laminin as a target of choice for dermocosmetic applications.

Coralie MARTIN, Head of Marketing at DEINOVE, states: *"The in-depth studies we have conducted show that Phytoene acts at the cellular level, in addition to collagen, to promote cellular regeneration and therefore anti-aging action. This is an innovative mechanism of action and is of obvious interest to the cosmetics industry. »*

¹ Adv Wound Care (New Rochelle), 2015 Apr 1; 4(4): 250–263, Laminins: Roles and Utility in Wound Repair, Valentina Iorio, Lee D. Troughton, Kevin J. Hamill
Adv Exp Med Biol, 2014; 802:31-47, Basic components of connective tissues and extracellular matrix, Halper J, Kjaer M.
J Dermatol Sci., 2000 Dec;24 Suppl 1:S51-9., The importance of laminin 5 in the dermal-epidermal basement membrane. Nishiyama T, Amano S, Tsunenaga M

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This tangible scientific data strengthens the sales argument for Phytoene worldwide and allows it to differentiate itself in an extremely competitive way compared to other solutions available today. To date, several tens of customers have been sampled with this innovative asset for confirmatory testing and the first sales should start by the end of the year.

Eventually, such an asset which benefits are clinically proven and which mechanism of action is identified can represent sales of several tons and generate a turnover of several million.

This is the first of a portfolio of assets developed in full by DEINOVE, which will include several of them by the time the next major cosmetics trade fair is held in April 2020 (In-Cosmetics 2020).

ABOUT PHYTOENE

A breakthrough in naturally-sourced active ingredients: DEINOVE bioproduced the 1st pure Phytoene.

Nature is a prodigious laboratory, capable of designing highly efficient molecules. Both skin cells and plants rely on a common substance to protect themselves from oxidative stress: Phytoene, the original precursor of all carotenoids. However, unlike plants, skin cannot synthesize it. Phytoene counts among these essential molecules that need to be brought through food or external supplementation, either oral or topical.

So far there was no way to extract pure Phytoene. None of the available production processes from plants allows the production of pure Phytoene. They provide only a mix of carotenoids, at low concentration, and with varying degrees of stability and colors.

Tapping into the extraordinary resources of biomimetism and symbiosis, harnessing the potential of *Deinococcus geothermalis*, a UV-resistant extremophile bacterium, DEINOVE has for the first time ever achieved the bioproduction of pure Phytoene.

Extended anti-aging properties

Carotenoids are known for their anti-oxidant properties. Phytoene has been successfully tested for its ability to reduce the amount of lipoperoxidation products, appearing after cells exposure to UV radiations. Indeed, phytoene accumulates in cellular membranes to prevent cellular degradation. By protecting membranes lipids from free radicals and peroxidation, Phytoene reduces the harmful effects of oxidation and, ultimately, skin aging.

DEINOVE went even further while putting in place a systematic screening of its active ingredients across several dimensions. This comprehensive, innovative approach has highlighted a previously untapped feature under the carotenoid family: cell renewal stimulation. Wounded skin is able to regenerate under the action of phytoene.

These properties were subsequently confirmed by a conclusive clinical study, demonstrating its beneficial effect on skin firmness, elasticity and radiance. Above all, Phytoene has a significant anti-wrinkles action.

This makes Phytoene a thorough anti-aging active ingredient for the beauty industry.

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ABOUT DEINOVE

DEINOVE is a French biotechnology company, a leader in disruptive innovation, which aims to help meet the challenges of antibiotic resistance and the transition to a sustainable production model for the cosmetics and nutrition industries.

DEINOVE has developed a unique and comprehensive expertise in the field of rare bacteria that it can decipher, culture, and optimize to disclose unsuspected possibilities and induce them to produce biobased molecules with activities of interest on an industrial scale. To do so, DEINOVE has been building and documenting since its creation an unparalleled biodiversity bank that it exploits thanks to a unique technological platform in Europe.

DEINOVE is organized around two areas of expertise:

- **ANTIBIOTICS, new-generation anti-infective agents:** DEINOVE is preparing to enter a first antibiotic candidate into Phase II. The Company is also pursuing the systematic exploration of biodiversity to supply its portfolio with new leads, drawing notably on partnerships with Naicons, bioMérieux, and the Institut Pasteur (AGIR program supported by Bpifrance).
- **BIOACTIVES, Active ingredients of natural origin** with cosmetics as the first market and potential in nutrition and health: DEINOVE already markets a first innovative active ingredient, a second in partnership with Greentech, while two others are in development with Oléos (Hallstar Group). It also runs a program in animal nutrition with Groupe Avril. Several other partnerships are also being planned.

Within the Euromedecine science park located in Montpellier, DEINOVE employs 62 employees, mainly researchers, engineers, and technicians, and has filed more than 310 patent applications internationally. The Company has been listed on EURONEXT GROWTH® since April 2010.

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