

Press release

DEINOVE CONFIRMS ITS CAROTENOIDS COMMERCIALIZATION POTENTIAL THANKS TO MAJOR PROGRESS

- Increased number of target molecules with now five carotenoids produced at the lab scale paving the way for different markets
- Increased yields by a factor of 6 to 8, depending on the molecule, reaching commercial levels for some
- Continued R&D work and engagement of a functional and regulatory validation campaign to obtain a commercial supply of carotenoids in two and a half years.

Montpellier, 8 February 2016 – DEINOVE (Alternext Paris: ALDEI), a biotech company developing innovative processes for producing biofuels and bio-based chemicals by using *Deinococcus* bacteria as host strains, announces major progress in its carotenoids project.

Researchers are making progress in the development of *Deinococcus* strains that are hyperproductive of carotenoids:

- Optimization of the strain by the high-throughput genetic engineering platform has increased product yields by a factor of 6 to 8 and thus achieving, for some of these molecules, satisfactory levels for subsequent scale-up;
- Identification of the terminal enzymes involved in the production of different carotenoids allows the production of three additional molecules of the same family from the two platform molecules initially produced.

DEINOVE's goal is to offer a competitive bio-based alternative for manufacturers by developing a range of natural carotenoids (unlike the current production, which is mainly petro-sourced) produced by biotechnological processes and offering significant advantages in terms of supply stability, consistent high quality, conservation of natural resources and also costs.

The next steps of the program are:

- Increasing the final yields and production volumes;
- Development of extraction and purification of these carotenoids to obtain a marketable product;
- Validation of the functional benefit of the molecules produced;
- Continuing regulatory proceedings for market authorization.

"The five molecules now developed in our program are all commercially used in cosmetics, food supplements and animal feed applications. The diversity of the targeted markets, in terms of application and geography, and the regulatory approaches associated with each, allows us to consider a number of marketing strategies with the aim of commercializing our first batches of target compounds in two and a half years," says Emmanuel PETIOT, CEO of DEINOVE. *"We consider carotenoids as a quick access opportunity to the market. At a time when oil price is so low, our biodiversity giving us access to specialty compounds, is a real asset to maximize our chances of success."*

About the DEINOVE Carotenoids program

Carotenoids are part of the isoprenoid family, which is the main area of research in the DEINOCHEM program supported by the Investments for the Future program¹. *Deinococcus* bacteria naturally produce carotenoids, which are compounds with high-added value, specifically a molecule called Deinoxanthin, untapped until now.

The carotenoids market

Carotenoids are a family of molecules naturally present in many living beings and widely used in the industry for their coloring, antioxidant and photo-protective properties. Their beneficial effect on the immune system is also being considered. The global market for carotenoids is expected to reach \$ 1.8 billion by 2019², with a strong demand in Europe and North America. The applications for these molecules continue to diversify, in food and feed, and in cosmetics and health.

About 75 % of existing production consists of petroleum derivatives; the rest is produced by plant extraction, the fastest growing sector, particularly benefiting from consumer demand. Yet, supply of bio-based solutions remains limited by high production costs related to low production yields and to the limited availability of raw materials (seasonality, sustainability, etc.).

¹ See the Press Release of November 13, 2013

² Source: MARZ, U. (July 2015) *The global market for carotenoids*. BCC Research

About DEINOVE

DEINOVE (Alternext Paris: ALDEI) is ushering in a new era of green chemistry by designing and developing new standards of production based on bacteria of untapped potential: the *Deinococci*. Taking advantage of the bacteria's unique genetic properties and unusual robustness, DEINOVE optimizes natural fermentation and metabolic capabilities of these bacterial "micro-factories" to produce high value-added products from non-food biomass. The Company's primary markets are 2nd-generation biofuels (DEINOL) and bio-based chemicals (DEINOCHEM). On these markets, the Company offers its technology to industrial partners globally.

Listed on NYSE Alternext since April 2010, DEINOVE was founded by Dr. Philippe Pouletty, General Partner of TRUFFLE CAPITAL, and Pr. Miroslav Radman, of the Faculty of Medicine of Paris Descartes University. The company employs almost 50 people in its offices and laboratories located in Montpellier, France.

More information at www.deinove.com

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