

### 2016 INTERIM RESULTS: STABILITY OF NET LOSS STRATEGIC REFOCUSING ON CAROTENOIDS AND ANTIBIOTICS

- **Cash position: +€10.4 M at June 30, 2016 compared to +€12.4 M at December 31, 2015**
- **Stability of interim net loss at -€3.1M**
- **Strategic decision to focus the Company's activities on high value-added applications in human health (antibiotics), nutrition and cosmetic (carotenoids particularly)**
- **Strengthening of DEINOCHEM program, continuation of AVRIL et FLINT HILLS RESOURCES collaborations, suspension of DEINOL program**
- **Expansion of antibiotics project, in relation to The United Nations and the World Health Organization appeal on September 21, 2016<sup>1</sup> about the need for new antibiotics, and mainly DEINOBIOTICS identification of new classes of antibiotics produced by DEINOVE's strain library. Selection of a first chemical family whose efficacy and pharmacological properties are currently being evaluated**
- **Decision to convert DEINOBIOTICS into a wholly owned subsidiary (currently 49% held by DEINOVE)**

**Montpellier, September 29, 2016** – DEINOVE (Alternext Paris: ALDEI), a biotech company that discovers, develops and produces high value-added compounds from rare bacteria, including *Deinococcus* bacteria, released its interim results for 2016. Meeting on September 27, the Board of Directors approved the accounts and decided on a strategic refocus of its activities on high value-added markets of carotenoids (nutrition and cosmetics) and antibiotics (human health), with notably the conversion of DEINOBIOTICS' activities (created in 2012, specialized in research & development of novel antibiotics, and currently a minority subsidiary of DEINOVE) into a wholly owned subsidiary through DEINOBIOTICS shareholders' contributions in kind to DEINOVE.

Since 2009, DEINOVE leads research on the discovery of new antibiotics thanks to its bacterial platform. The global antibiotics resistance issue, solemnly stated on September 21 by the UN and the WHO announcements, should create a favorable new environment for rare biotech companies able to discover new antibiotics. Considering the promising results of its minority subsidiary DEINOBIOTICS (created in 2012, with laboratories in Lille), DEINOVE plans to expand its antibiotics platform in Montpellier and Lille, by converting DEINOBIOTICS into a wholly owned subsidiary. At the same time, due to current unfavorable context for 2<sup>nd</sup> generation biofuel development (low oil prices, industrial actors' disengagement in the sector, lack of governments support), and the strong potential of other technologies and products developed by DEINOVE, the Company decided to refocus its resources on high value-added applications of new antibiotics, and carotenoids in nutrition and cosmetics. In addition to consolidating and expanding DEINOBIOTICS' activities, the teams will concentrate their efforts on the DEINOCHEM/carotenoids program, make headway on nutrition projects with AVRIL and FLINT HILLS RESOURCES and foster other partnerships on target markets of health and cosmetics for

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<sup>1</sup> <http://www.who.int/mediacentre/news/releases/2016/commitment-antimicrobial-resistance/fr/>

which DEINOVE has developed a program to identify other compounds of interest within its strain library. DEINOL program allowed a global mastery of the intellectual property, the genetics, the metabolism and the fermentation of *Deinococcus*, directly benefiting to other projects. Industrial development of biofuel is suspended until a potential change of the biofuels market context.

*"New antibiotics discovery answers to a priority global medical need. Few biotech companies can claim discovering new classes of antibiotics. DEINOBOTICS research on new antibiotics, from DEINOVE's strain library, enabled identification of a first high-potential lead. DEINOVE's specialty programs, particularly DEINOCHEM program and projects in animal nutrition lead with our partners, are progressing as expected, while the 2<sup>nd</sup> generation biofuel market is waiting for a rise in oil prices. In this context, we have decided to bring DEINOBOTICS and DEINOVE's teams together and to focus our efforts on higher value-added programs and those that offer short-term income opportunities, in order to create more value for our partners and shareholders",* announce Emmanuel PETIOT, CEO of DEINOVE. He adds: *"Our 2<sup>nd</sup> generation biofuel program has made several advances, including the proof of concept that Deinococcus can be a true innovative chassis for biological production. Incidentally, this will give our new strategy a solid technological footing. We have also built a cutting-edge integrated genetic, metabolic and fermentation engineering platform. We will capitalize on these developments by focusing on applications for which there already is a market; carotenoids, in particular, have many potential health, cosmetic and nutrition applications with high added value".*

Dominique LE BELLER, CEO of DEINOBOTICS, adds: *"The discovery of new antibiotics with innovative structures is a global public health issue as cases of resistance to existing antibiotics continue to heighten. Last week, this major medical need for new antibiotics was solemnly highlighted by The UN and the WHO, and governments of 193 countries. Since 2010, no new innovative antibiotic reached the market, and there were only 3 in the preceding 5 years. Microorganisms are the most efficient antibiotics producers of the living world but the discovery of new antibiotics is challenged by the almost exhaustive use of the same bacteria; DEINOVE's outstanding library of bacteria strains never used for antibiotics discovery, has great potential for accessing new molecules of therapeutic value. We have already identified several promising molecules and a first lead is currently undergoing optimization and advanced preclinical research. The opportunity for non-dilutive financing, pharmaceuticals agreements and value creation is significant. By teaming up with DEINOVE, we gain access to R&D synergy capacities that can accelerate our projects."*

## SELECTED FINANCIAL INFORMATION

(in thousands of euros)	6 month period ending 30 June	
	2016	2015
Total operating revenues	208	69
Total operating costs	4,344	4,059
<i>o/w Research &amp; Development costs</i>	3,402	3,141
<i>o/w Administrative and General costs</i>	942	918
<b>Operating profit/loss</b>	<b>-4,136</b>	<b>-3,990</b>
Financial result	15	12
<b>Current pre-tax profit/loss</b>	<b>-4,121</b>	<b>-3,978</b>
Non-recurring items	236	-7
Income tax (R&D Tax Credit)	-745	-816
<b>PROFIT/LOSS FOR THE PERIOD</b>	<b>-3,141</b>	<b>-3,170</b>

	as of 06/30/16	as of 12/31/15
<b>Net financial position</b>	<b>10,359</b>	<b>12,432</b>
<i>o/w financial investments<sup>1</sup></i>	0	0
<i>o/w term deposits (maturity &lt; 1 year)</i>	0	0
<i>o/w cash instruments (maturity &lt; 3 months)</i>	0	0
<i>o/w cash on hand</i>	10,359	12,432
<i>(o/w financial debts)</i>	0	0
<b>Total assets</b>	<b>14,416</b>	<b>17,327</b>
<b>TOTAL SHAREHOLDERS' EQUITY</b>	<b>12,669</b>	<b>14,593</b>
<i>o/w equity</i>	4,919	8,096
<i>o/w conditional advances</i>	7,750	6,497

<sup>1</sup>Excluding loans, liquidity agreement items (cash and own shares), deposits and guarantees.

## FINANCIAL RESULTS FOR THE SIX-MONTH PERIOD

### Operating result

DEINOVE received €208K in operating income for the six-month period, primarily from grants and R&D partnerships (AVRIL and FLINT HILLS RESOURCES). At the same time, operating costs rose by +7% to €4.3m.

R&D expenses, accounting for 78% of the operating expenses (vs 77% in H1 2015), rose by +8%, in keeping with the increased payroll (+3 average FTEs) and the expansion of laboratories (rents, equipment, etc.). Subcontracting expenditure dropped due to the end of certain contracts (with VTT in particular). G&A expenses rose slightly to €942K.

The Company pursued its investments over the period, mainly for the automation and development of the engineering platform, and in accordance with the growth of the DEINOCHEM program.

### Net result

The net loss of the semester is in line with the loss recorded for the same period in 2015, at €3.1m. It includes a positive non-recurring items gain of €236k (including a €224k repayable advance write-off by Bpifrance), and a financial profit of +€15k.

## FINANCIAL SITUATION

Financing of operating expenses in H1 2016 required €4.0m (excluding depreciation charges) as well as laboratory equipment investments (including financial leases rents) of approximately €720k. In addition, DEINOVE subscribed to straight bonds emitted by DEINOBIOTICS for an amount of €500k.

Over the same period, the Company received €1.5m as a repayable advance (3<sup>rd</sup> payment by ADEME under the DEINOCHEM program), and €140k in grants (Bpifrance/CMI). Late June 2016, DEINOVE also received the restitution of the 2015 R&D Tax Credit (CIR) for a total €1.6m.

As of June 30, 2016, the Company's net financial position stood at +€10.4m vs. +€12.4m at January 1, 2016, namely a net consumption of -€2.1m over the six-month period.

## ADVANCES OVER THE SIX-MONTH PERIOD & STRATEGIC CONSIDERATIONS

During its meeting of September 27, 2016, DEINOVE's Board of Directors examined the advances made over the six-month period and the Company's general environment.

### DEINOCHEM program

Studies carried out for the potential applications of carotenoids validate the interest these molecules have for cosmetic and health applications, both high value-added markets in which DEINOVE can project various revenue models either through selling licenses or by directly producing compounds with partners without having to make heavy industrial investments.

In February, DEINOVE announced that it had increased the number of accessible molecules and now has five carotenoids produced at laboratory scale and yields improved by a factor of 6 to 8 depending on the molecule<sup>2</sup>. In June, DEINOVE validated the 2<sup>nd</sup> key milestone of the DEINOCHEM program, which was sealed by the payment of €1.5m from ADEME<sup>3</sup>. The achievement of deliverables confirmed progress made in the development of carotenoids hyperproductive Deinococcus strains. The main milestones were the sequencing and annotation of a hundred strains, the strengthening of fermentation capabilities (x10) and the achievement of targeted production yields up to five times greater than that of the wild strain.

The Company aims to be able to sell the first batches of target compounds by 2018.

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<sup>2</sup> See Press Release of February 8, 2016.

<sup>3</sup> See Press Release of June 14, 2016.

Moreover, R&D animal nutrition programs run with AVRIL and FLINT HILLS RESOURCES are progressing according to the partners' expectations.

Finally, DEINOVE won the start-up phase of the 2<sup>nd</sup> edition of the Worldwide Innovation Challenge for DEINOPLAST (R&D program for bio-based production of muconic acid) for which it received a €200k grant<sup>4</sup>. This award acknowledges the quality of DEINOVE's technological platform.

### DEINOBIOTICS program

DEINOBIOTICS' aim is to discover novel antibiotics structures that can be used to fight against multi-resistant germs.

According to recent estimates, antibiotic resistance could cause 10 million deaths a year by 2050, more than today's cancers (8 million per year). Already some patients with pneumonia, tuberculosis or gonorrhoea, are in a therapeutic impasse because of the loss of efficacy of several classes of antibiotics<sup>5</sup>. While Dr. Fukuda, Deputy Director-General of the WHO, qualifies it as "*a real threat to society*"<sup>6</sup>, Dr. Margaret Chan, the Director General of the World Health Organization,<sup>7</sup> recalled in April: "*The situation is bad and getting worse, as I constantly repeat. This is a slow-motion tsunami that we need to urgently mobilize against,*".

In response, governments and manufacturers are multiplying plans and initiatives. The United Nations and the World Health Organization issued an appeal on September 21, 2016<sup>8</sup>, signed by 193 countries, warning about antibiotics resistance. The objectives are to reduce consumption, improve the use of existing antibiotics, and of course to identify and exploit new sources of antibiotics that will complete the existing armamentarium, thereby raising it to a level of efficacy equal to the threat.

DEINOVE and its subsidiary DEINOBIOTICS have already been anticipating this need for several years. Convinced from the start that its collection of rare bacteria contained strains capable of producing new antibiotics, DEINOVE has gathered a team of experts around one of the best French specialists in antimicrobial Research and Development, and created DEINOBIOTICS in 2012 as a subsidiary<sup>9</sup>. Over the past few months, DEINOBIOTICS has made considerable progress in its research programs in its laboratories in Lille, and identified in DEINOVE's strain library new classes of antibiotics. With novel chemical structures, these new antibiotics are provided with very interesting activity spectrums, particularly against pathogens bacteria resistant to existing antibiotics. A first lead, with a promising antibiotic activity, has already been selected for preclinical advanced research.

DEINOBIOTICS needs additional resources to continue its research with a priority on equipment and genetic, metabolic and fermentation engineering know-how. DEINOVE, with its cutting-edge

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<sup>4</sup> See Press Release of May 24, 2016.

<sup>5</sup> WHO's antibiotic resistant fact sheet: <http://www.who.int/mediacentre/factsheets/antibiotic-resistance/en/>

<sup>6</sup> <http://www.laprovince.be/1676400/article/2016-09-20/nouveau-fleau-planetaire-les-super-bacteries-resistantes-aux-antibiotiques-qui-r>

<sup>7</sup> Speech on April 18, 2016 by Dr. Margaret Chan before representatives of the UN Member States: [www.who.int/dg/speeches/2016/antimicrobial-resistance-un/en/](http://www.who.int/dg/speeches/2016/antimicrobial-resistance-un/en/)

<sup>8</sup> <http://www.who.int/mediacentre/news/releases/2016/commitment-antimicrobial-resistance/fr/>

<sup>9</sup> The subsidiary is 49% owned by DEINOVE, soon to be 100%, subject to (i) signing of the contribution agreement and (ii) approval of transfer transactions in kind, and the subsequent decision to increase capital by a DEINOVE General Meeting, to be convened in the upcoming weeks.

technological platform, has such resources and will now put them to use for these developments. DEINOBOTICS program will be amplified in Montpellier and Lille laboratories.

### DEINOL program

So far, DEINOVE's teams have managed to:

- select and optimize a *Deinococcus* bacterial chassis adapted to industrial production constraints;
- establish a strain able to produce ethanol by hydrolysis and fermentation of various vegetable raw materials;
- produce ethanol with an alcohol content of 9% wt/v (7.3% v/v) in a 300l-fermentor from a mix of C5 and C6 sugars (representative of the composition of biomass);
- improve the strain's tolerance to inhibitors common in 2G substrates.

Despite these advances, the prospect of quickly generating income from this activity does not seem realistic given the economic factors and the current market structure.

The global context remains unfavorable for the development of 2<sup>nd</sup> generation biofuels. The continuous slump in oil prices weighs heavily on biofuel producers' competitive edge and puts even more pressure on all areas of research: production performance goals are much more ambitious and difficult to achieve, which lengthens development time.

The various 2G fuel ethanol plants currently in operation are struggling to deliver on yields and production level expected. Technological hurdles remain and market players are reluctant to develop new technologies as long as existing plants remain unsteady and the price of oil has not recovered. Pavel Molchanov, a Raymond James & Associates analyst specialized in cleantech energy in the United States, commenting the sector last June stated: "*The scale-up of 2nd generation biofuel technologies has fallen well short of expectations. Numerous operational and mechanical incidents occurred which today result in the near total absence of production of this type of biofuel.*"

On top of this, several biotech industry players announced these last months that they will refocus on specialty compounds, particularly in the fields of nutrition and personal care (cosmetics and beauty products), facing falling oil prices and difficulties in financing their biofuel projects. This is the case for Solazyme/Terravia, but also for Codexis and Amyris. At the same time, the main players in the chemical sector have initiated mergers, as illustrated by the DuPont-Dow Chemical merger.

ABENGOA, the DEINOL program's main industry player, began pre-bankruptcy procedures in November 2015. Since then, the Spanish group has decided to focus on its "engineering and industrial construction" activity and began a vast asset divestiture program to lighten its debt and finalize an agreement with its creditors. ABENGOA sold its American biofuel plants<sup>10</sup> (its main 2<sup>nd</sup> generation plant in Kansas closed in December 2015<sup>11</sup>) and is looking for buyers for its European sites.

This context has led DEINOVE to review its biofuel strategy and suspend its DEINOL program.

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<sup>10</sup> [www.ethanolproducer.com/articles/12988/abengoa-announces-plan-to-sell-first-generation-biofuel-assets](http://www.ethanolproducer.com/articles/12988/abengoa-announces-plan-to-sell-first-generation-biofuel-assets)

<sup>11</sup> [www.biofuelsdigest.com/bdigest/2015/12/03/abengoa-shuts-down-hugoton-colwich-st-louis-hq/](http://www.biofuelsdigest.com/bdigest/2015/12/03/abengoa-shuts-down-hugoton-colwich-st-louis-hq/)

## Technology, Intellectual Property and R&D

The Company initiated a full overhaul of its strain library, DEINOVE's unrivalled biological heritage. This led to the identification of compounds of interest that match AVRIL and FLINT HILLS RESOURCES' needs and expectations. Current developments only use a fraction of DEINOVE's strain library, which is a high-potential strategic asset and could become a new source of natural ingredients (in addition to the innovative carotenoids naturally produced by 400 of the 6,000 strains in the library). The strain library will be explored further to identify new molecules of interest.

As part of research carried out under the DEINOL program, DEINOVE built a platform that is extremely sophisticated in terms of strain selection, strain design and fermentation engineering. Other research programs are able to benefit fully from these technological advances.

To optimize the use of *Deinococcus* as a new chassis for biological production, DEINOVE undertook a technological partnership with Toulouse White Biotechnology (TWB)<sup>12</sup> to map the metabolic fluxes of *Deinococcus*. The idea is to create an inventory of all the potential uses of the microorganism in the production of molecules of interest. This mapping, both qualitative and quantitative, will serve as a reference to identify and optimize all the metabolic pathways of the *Deinococcus* model to rapidly reach the target yields and productivity of industrial processes developed by the Company.

## STRATEGIC REFOCUSING AND NEW ORGANIZATION

After analyzing the six-month period trends, the Board of Directors of September 27, 2016, validated the refocusing of DEINOVE's activities towards health, nutrition and cosmetic high value-added applications with the objective to accelerate revenue generation and focus resources on higher value-added applications. The Board decided on the following developments:

- The reintegration of DEINOBOTICS' operations within DEINOVE: part of DEINOVE's resources will be reallocated to the development of DEINOBOTICS' programs, which in return will share its know-how in the production, characterization and optimization of secondary metabolites with DEINOVE.
- In legal terms, and subject to (i) signing of the contribution agreement and (ii) approval of transfer transactions in kind, and the subsequent decision to increase capital by a DEINOVE General Meeting, to be summoned in the coming weeks, DEINOVE will own 100% of its DEINOBOTICS subsidiary, at the conclusion of transactions of contributions in kind of DEINOBOTICS' shareholders shares in favor of DEINOVE. The subsequent dilution of DEINOVE's shareholders is estimated at about 10%.
- DEINOVE's other resources will be allocated in priority to continuing the development of carotenoids (DEINOCHEM program), of programs developed in partnerships with AVRIL, FLINT HILLS RESOURCES and other more upstream programs, with partners that have not yet been made public, and which are all moving towards being scientifically validated. All efforts will be focused on achieving these programs' objectives and generating revenue as soon as possible. Specialty compounds are characterized by shorter development period and higher potential profit margins.
- DEINOVE's launch of a vast program to screen its strain library should result in the identification of specialty compounds in the fields of health, nutrition and cosmetics. This

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<sup>12</sup> See Press Release of May 9, 2016.

program is currently in an *in vitro* screening phase to identify positive hits that will be sent on for more in-depth efficacy testing to validate their interest for these sectors.

- The Deinol program is suspended, as well as its associated partnerships. DEINOVE will however continue to examine all possible avenues to create value from the assets related to this program.
- Reorganization of DEINOVE:
  - Dominique LE BELLER and his team will report directly to DEINOVE;
  - A Preclinical Study Project Manager will join the antibiotics development team;
  - The teams previously assigned to the DEINOL project and the Biomass platform will join the DEINOBOTICS, screening, fermentation and analytical teams.
  - The number of DEINOVE's employees after DEINOBOTICS integration will stay stable compared to current situation

DEINOVE will now concentrate its research on high value-added applications in the following fields:

- Health, by researching and developing new antibiotics echoing to a strong global medical need, and by exploiting the therapeutic properties of other compounds such as carotenoids that can be of interest for inflammation, ocular health, skin disorders and other applications...
- Human and animal nutrition, with molecules with coloring, antioxidant and nutritive properties;
- Cosmetics and personal care products, with molecules with antioxidant and anti-ageing properties, texturizing agents, etc.

DEINOVE's aim is to become a cutting-edge biotech firm that, by drawing on its biological heritage and technological platform, can deliver radical innovation to fields that are of high added value for the entire company.

## About DEINOVE

DEINOVE (Alternext Paris: ALDEI) is a biotech company that develops production processes of specialty ingredients for health, nutrition and cosmetic markets.

These production methods offer a sustainable, competitive alternative and represent a new source of innovative natural ingredients.

To do so, DEINOVE draws on its library of 6,000 rare bacterial strains, mainly *Deinococcus*, and its platform for genetic, metabolic and fermentation engineering.

Based in Montpellier, DEINOVE employs approximately 50 employees and has nearly 170 international patents. The Company has been listed on Alternext since April 2010.

*For more information go to [www.DEINOVE.com](http://www.DEINOVE.com)*

*The 2016 half-year report is available on the Company's website:*

*[www.DEINOVE.com/fr/espace-investisseurs/centre-documentation/rapports-financiers](http://www.DEINOVE.com/fr/espace-investisseurs/centre-documentation/rapports-financiers)*

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