



# INNOVATIVE AND NATURALLY-SOURCED ACTIVE MOLECULES FOR HEALTH, NUTRITION AND COSMETICS

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# DEINOVE AT A GLANCE

DEINOVE HARNESSES THE POTENTIAL OF  
ITS REMARKABLE COLLECTION OF RARE MICROORGANISMS



TO PROVIDE INNOVATIVE COMPOUNDS FOR APPLICATIONS IN :

57 B\$ in 2018  
(Future Market Insights & BCC)

**HEALTH**

Antibiotics  
Antifungals


**100% DEINOVE**

**DEINOBOTICS**   
The deinococcus way to antibiotics

22 B\$  
(Kline)

**COSMETICS**

Antioxidants (carotenoids)  
Bioactive compounds  
Pigments...

 **BIOTECHNOLOGIES**  
**GREENTECH**

20 B\$ in 2018  
(MarketsandMarkets)

**NUTRITION**

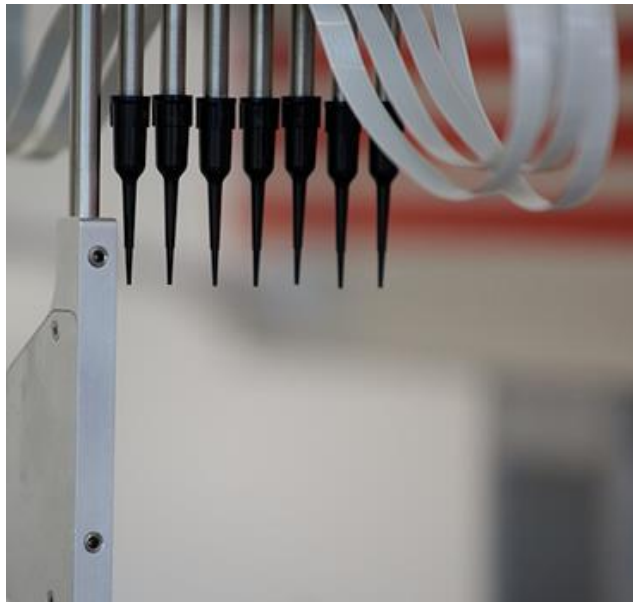
Antioxidants  
Coloring agents (carotenoids)  
Nutritional additives, etc.

**Avril**  **FLINT HILLS**  
resources®



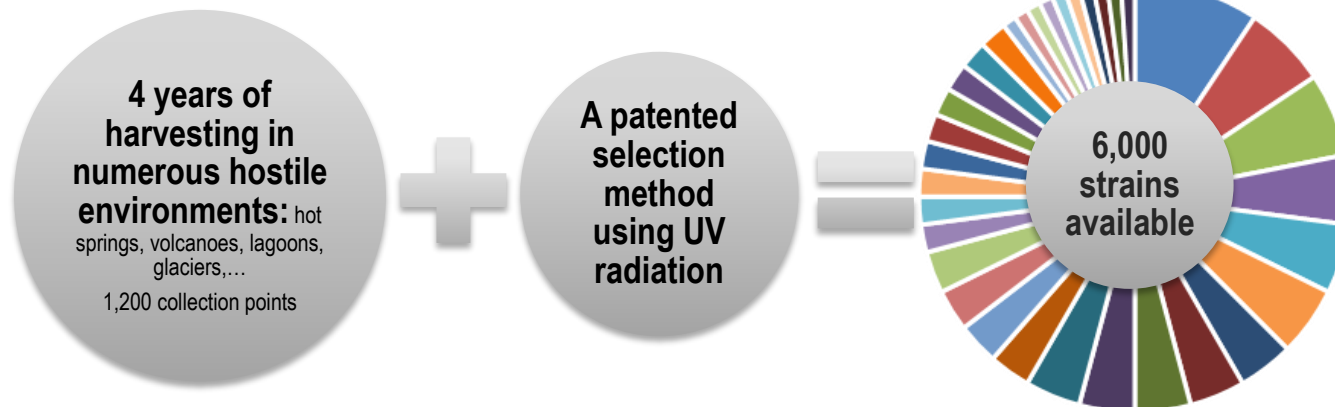
## MERGING BIOLOGY AND TECHNOLOGY

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# A COLLECTION OF 6,000 STRAINS

## A UNIQUE BIODIVERSITY, UNTAPPED SOURCE OF INNOVATION



- *Deinococcus*
- Others
- *Bacillus*
- *Microbacterium*
- *Arthrobacter*
- *Rhodococcus*
- *Delftia*
- *Micrococcus*
- *Paenibacillus*
- *Pseudomonas*
- *Curtobacterium*
- *Cellulomonas*
- *Microvirgula*
- *Cellulosimicrobium*
- *Kocuria*
- *Leifsonia*
- *Stenotrophomonas*
- *Lactococcus*
- *Brevibacillus*
- *Cupriavidus*
- *Enterobacteriaceae*
- *Serratia*



*Anoxybacillus kamchatkensis*



*Aeromonas* sp.



*Brevibacillus thermoruber*



*Deinococcus geothermalis*

# ENGINEERING BIOLOGY

## CUTTING-EDGE TECHNOLOGIES, HIGHLY QUALIFIED STAFF

### COLLECTION AND AUTOMATED PRODUCTION OF EXTRACTS



- 6,000 *Deinococcus* strains and other rare bacteria
- Culture, selection and production of extracts
- Sequencing

### CUTTING EDGE ANALYTICAL PLATFORM



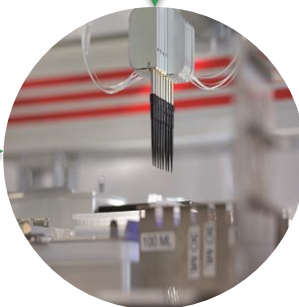
- Determine the structure of compounds produced (antibiotics, carotenoids)
- Analyze the strain metabolism for optimization purpose

### MOLECULES OF INTEREST



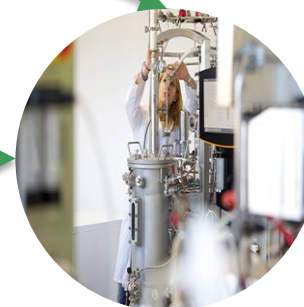
### IN VITRO SCREENING

- Test the strains
- Identify interesting features, production of compounds of interest



### AUTOMATED GENETIC ENGINEERING

- Optimize the strain for end use: yield, biodisponibility...

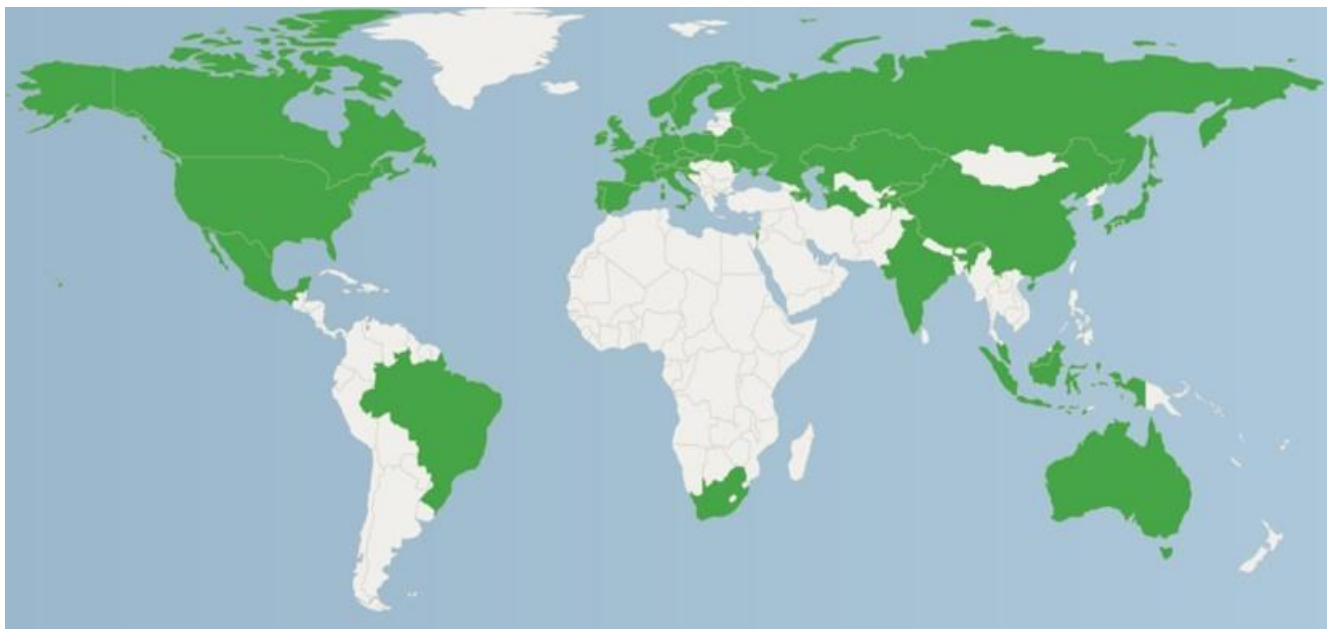
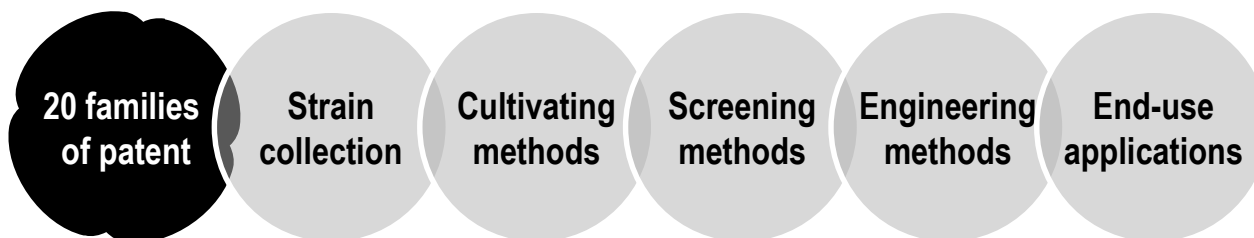


### FERMENTATION EXTRACTION, PURIFICATION

- Test and optimize the production process in increasing volumes
- Produce extracts for testing (efficacy, pharmacological properties...)

# EXCLUSIVE TECHNOLOGY PROTECTED BY PATENTS

## A BASIS TO CREATE VALUE

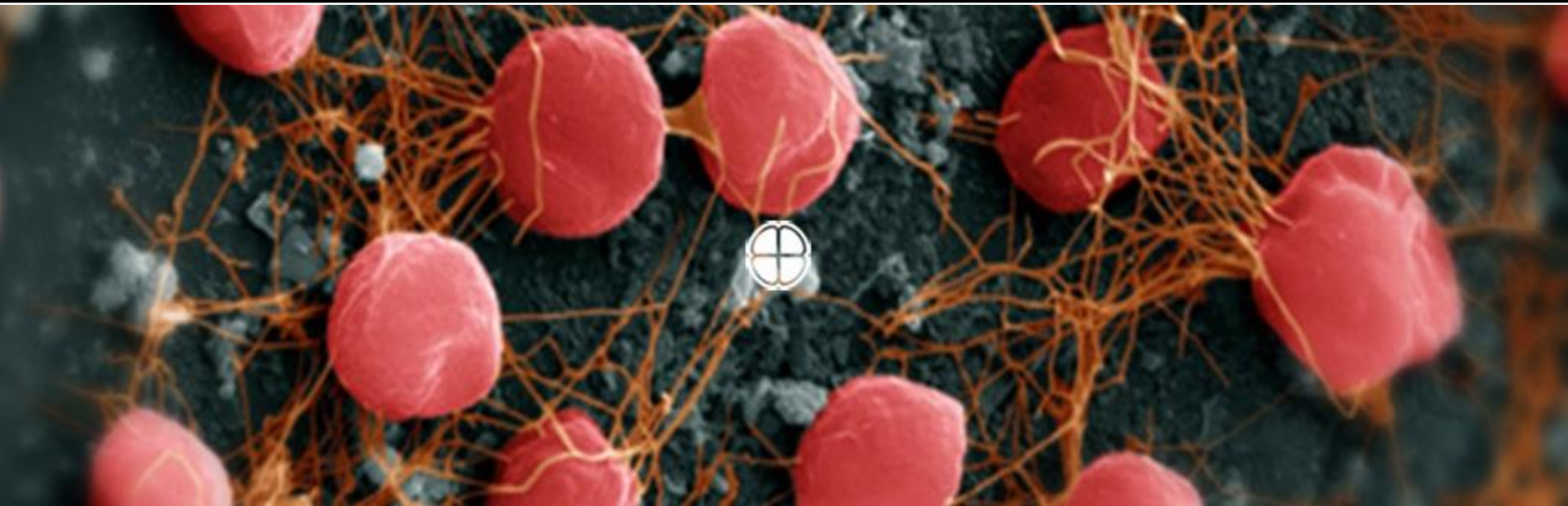






ADDRESS THE ANTIMICROBIAL RESISTANCE,  
A MAJOR PUBLIC HEALTH ISSUE

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# THE CHALLENGE OF ANTIMICROBIAL RESISTANCE

## CALL FROM THE UNITED NATIONS ON 21/09/2016

*« Antimicrobial resistance is a slow-motion tsunami that must be managed with the utmost urgency. Only two new classes of antibiotics have reached the market in the last 50 years. With few replacement products in the pipeline, the world is heading towards a post-antibiotic era in which common infections will once again kill. »*

**Dr Margaret Chan, Director-General of the WHO, Sept.2016**

➤ **URGENT NEED TO FIND NOVEL ANTIBIOTIC STRUCTURES  
TO FIGHT MULTI-RESISTANT PATHOGENS**



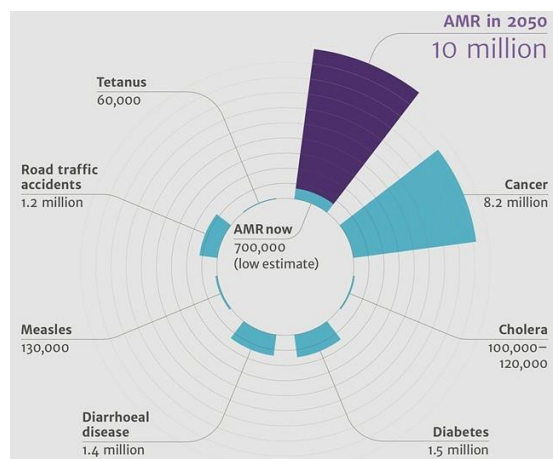
# THE CHALLENGE OF ANTIMICROBIAL RESISTANCE

## A MATTER OF URGENCY

### A THREAT TO PUBLIC HEALTH

Antimicrobial resistance (AMR) could cause  
**10 million deaths/year** by 2050

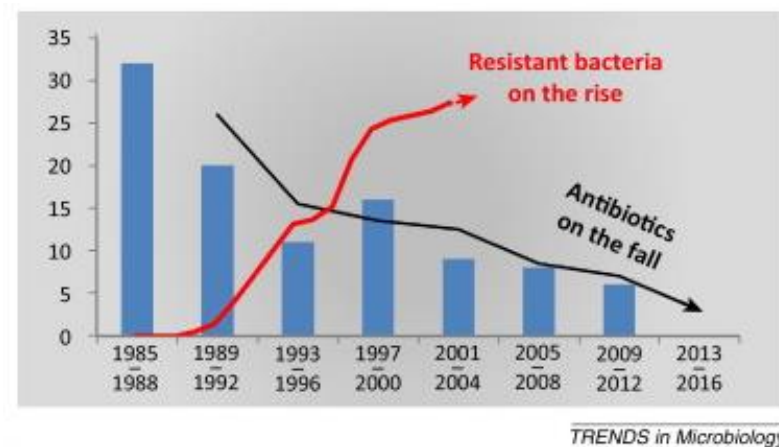
Today 700 000 deaths/year



Deaths attributable to antimicrobial resistance every year compared to other major causes of death (*World Health Organization*)

### ... WITH LITTLE REMEDIAL SOLUTIONS

Since the early 80's, the number of antibiotic molecules supplied to the market has dropped dramatically

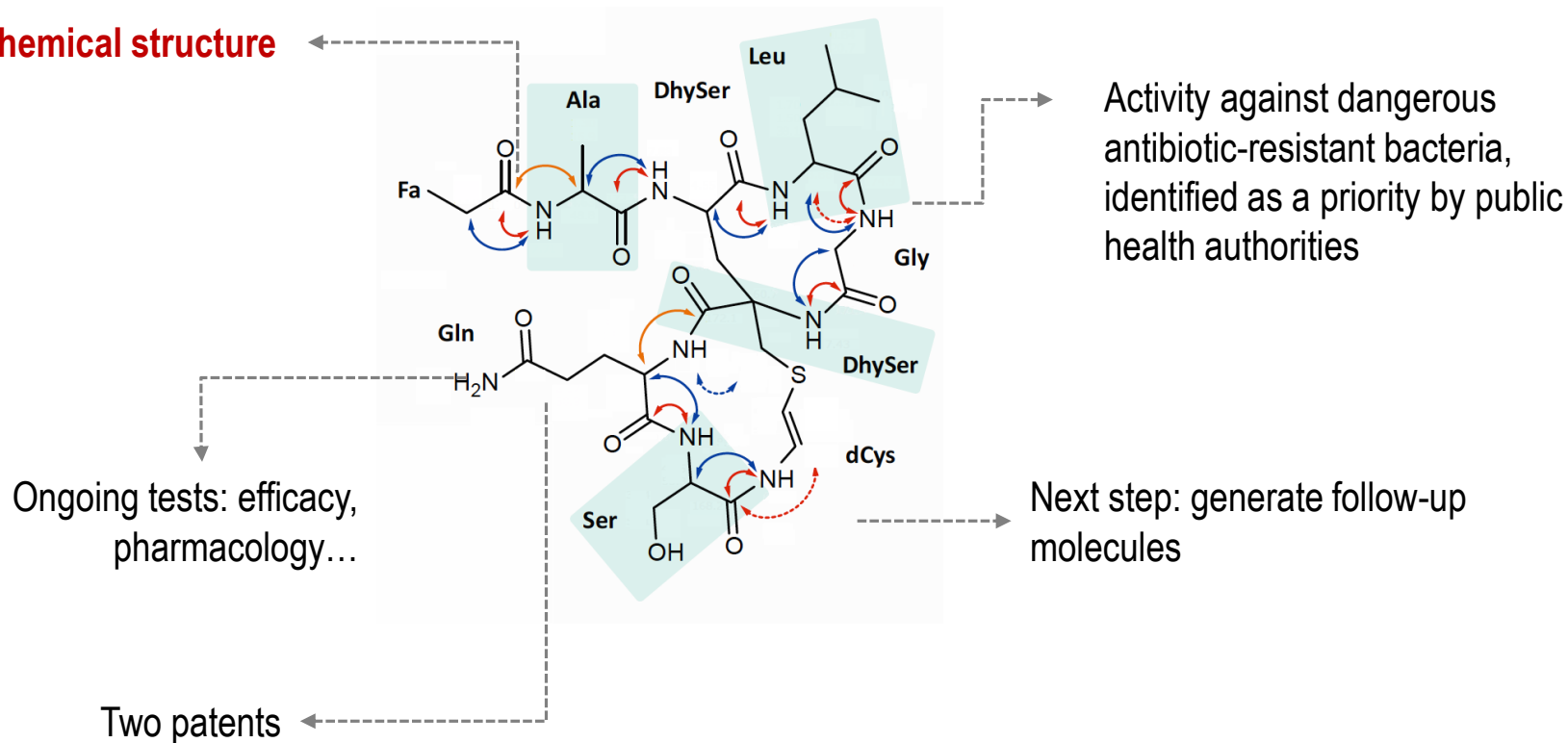


- ▶ BIG PHARMAS ARE NOW ACTIVELY LOOKING FOR NEW MOLECULES
- ▶ Explore novel bacterial genera as new sources

# DNB 101, THE FIRST INNOVATIVE STRUCTURE TO BE DISCOVERED THE BACKBONE FOR NEXT-GENERATION LEADS

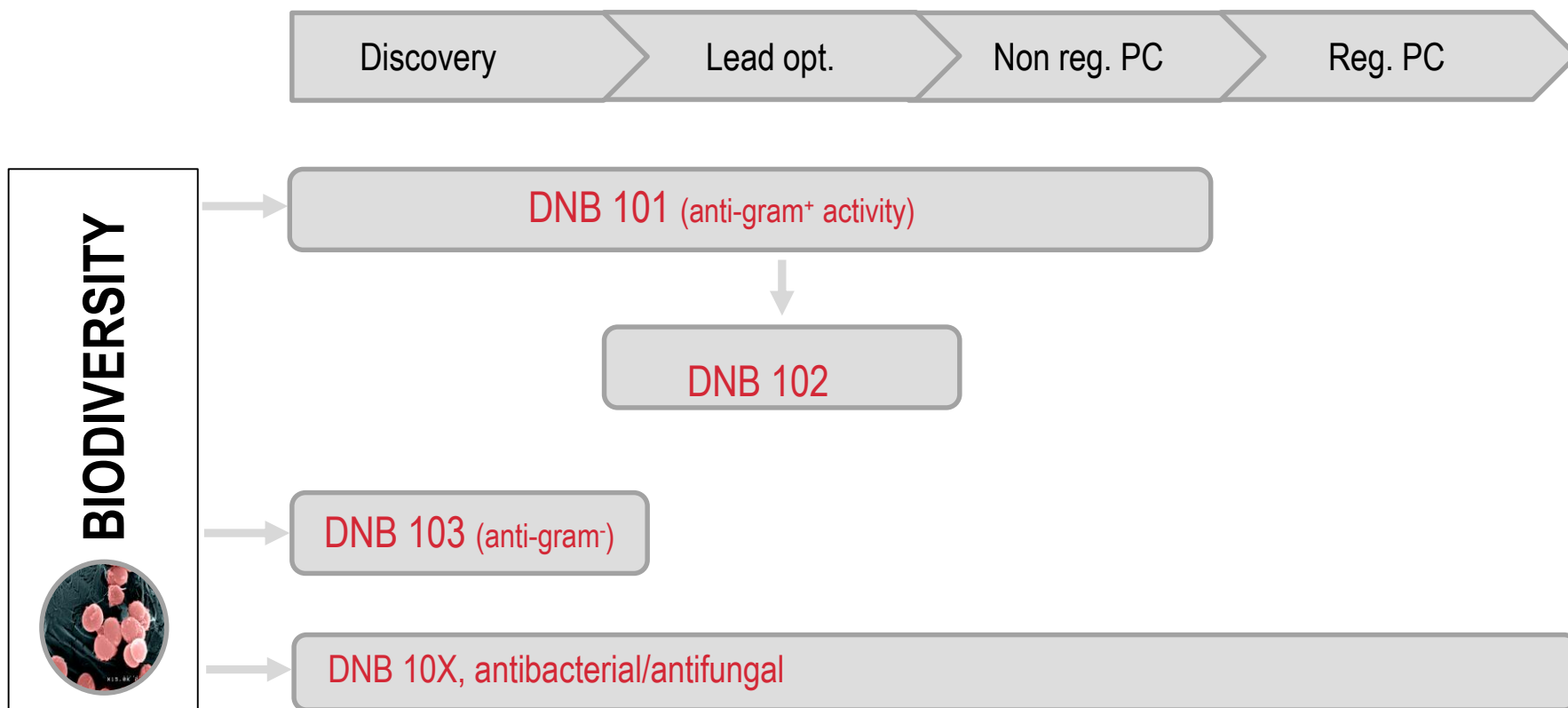
VALIDATES THE POTENTIAL OF DEINOVE'S BACTERIA AND PLATFORM  
AS A SOURCE OF NEW CLASSES OF ANTIBIOTICS

Novel chemical structure



# BUILDING A TRUE PIPELINE

## EFFECTIVELY ADDRESSING THE CONCERN OF MULTI-RESISTANCE



# ANTIBIOTICS PROJECT

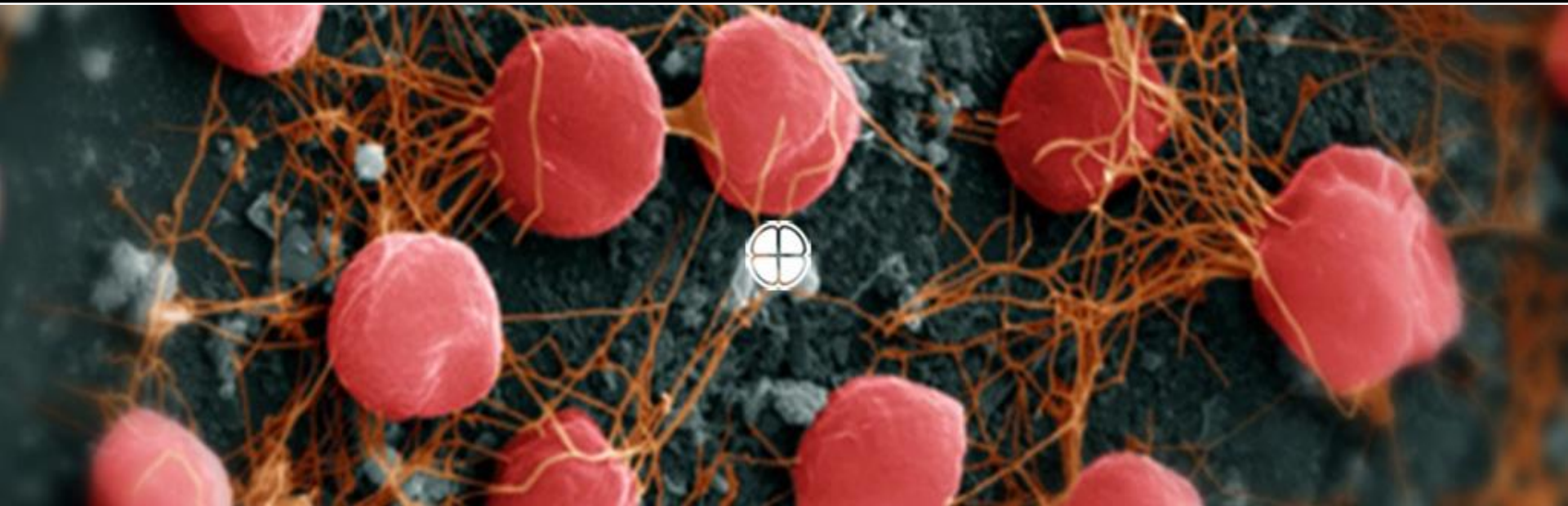
## GRANTED €14.6M BY 'INVEST FOR THE FUTURE' PROGRAM

- ➡ The AGIR project (Antibiotics against Resistant Infectious Germs), carried out by the DEINOVE group and the Charles Viollette Institute, aims to identify novel antibiotic structures from rare bacterial strains by developing new collection, culture, screening, optimization, and evaluation methods; and thus contribute to the development of treatments responding to the medical emergency.
- ➡ **A funding of €14,6 million from the « Investments for the future » program led by the General Investment Commission (CGI) and operated by Bpifrance**
  - > Five-year program
  - > Total budget estimated at €25m
- ➡ **The DEINOVE Group will receive €10.4m while the Charles Viollette institute will receive €4.2m**
- ➡ **This support demonstrates the French government's commitment to fighting resistance to antibiotics, which is a major health issue on a global scale.**



PROVIDE INDUSTRY WITH  
SUSTAINABLE AND INNOVATIVE SOLUTIONS

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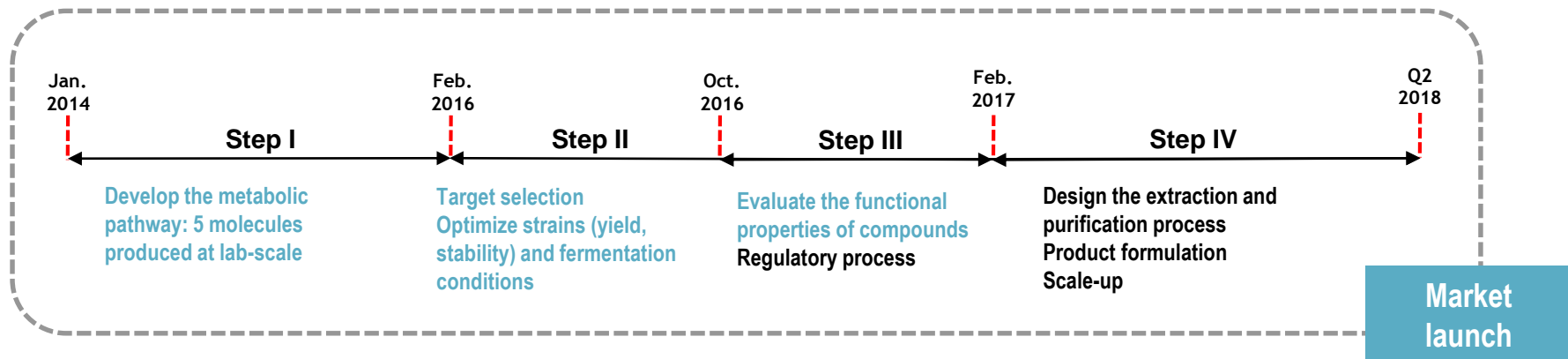
# XtremeCARE<sup>3</sup>: INNOVATIVE CAROTENOID FOR COSMETICS

## LAUNCH OF A NEW BIO-BASED COSMETIC ACTIVE



**XtremeCARE<sup>3</sup> :**  
*Inspired by nature,  
Made by science*  
A patented active  
ingredient, powerful  
antioxidant, multi-  
application

**Commercial launch  
in 2018!**



# COSMETICS: FIRST PARTNERSHIP WITH GREENTECH WITH SALES PERSPECTIVE AS OF 2018

Co-develop and market new active ingredients for skin care



Objective:

**A commercial launch  
by end of 2018**

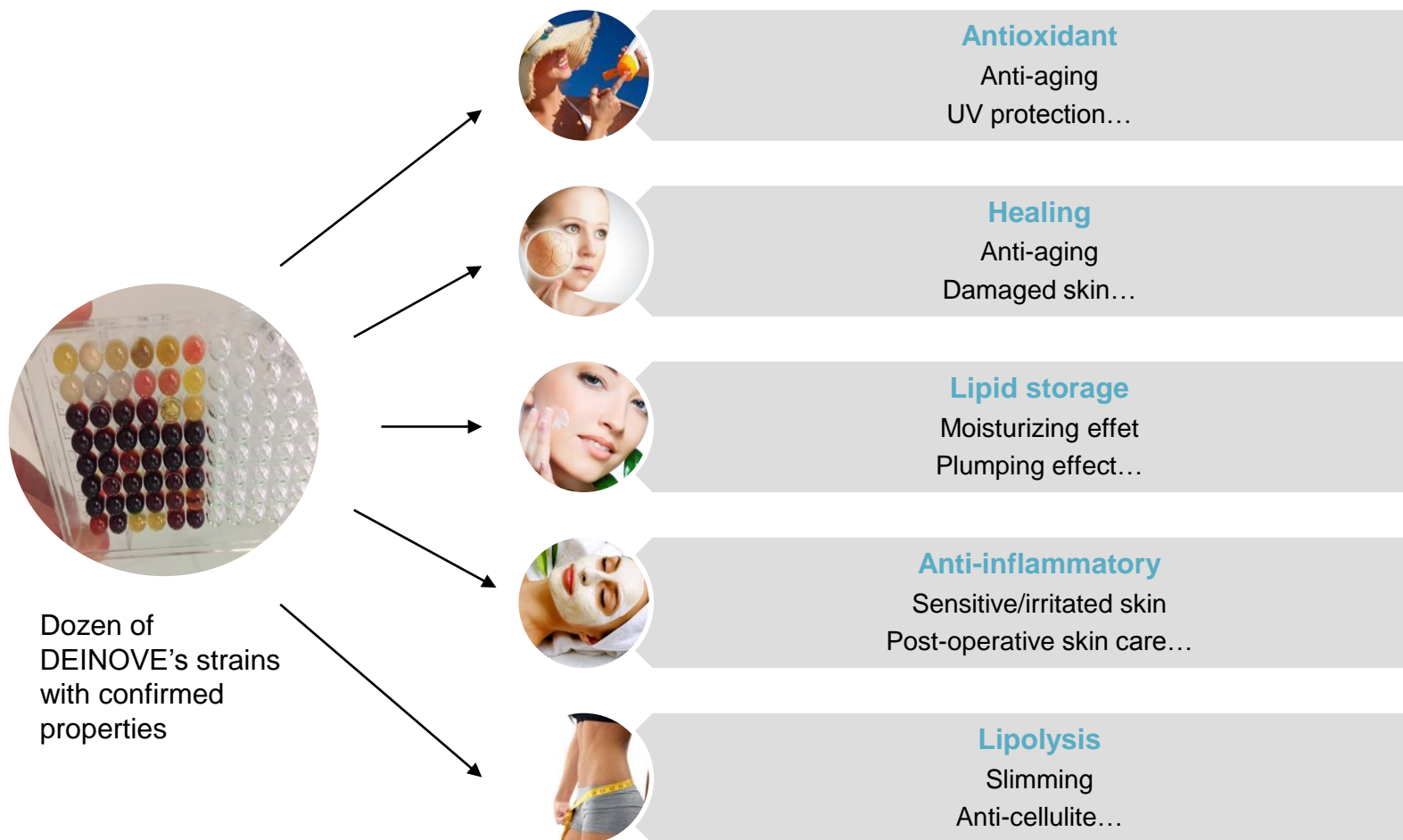
Major player in the  
production and distribution  
of biotechnologically  
obtained ingredients



Sells a hundred active  
ingredients derived from  
biodiversity to cosmetics  
manufacturers in over 30  
countries



# A CATALOG OF COSMETIC ACTIVE EXTRACTS TO CREATE NEW BUSINESS OPPORTUNITIES



# ANIMAL NUTRITION: TWO PARTNERSHIPS WITH BIG PLAYERS

## ZOOM IN ON « COLOR2B » PROJECT WITH AVRIL



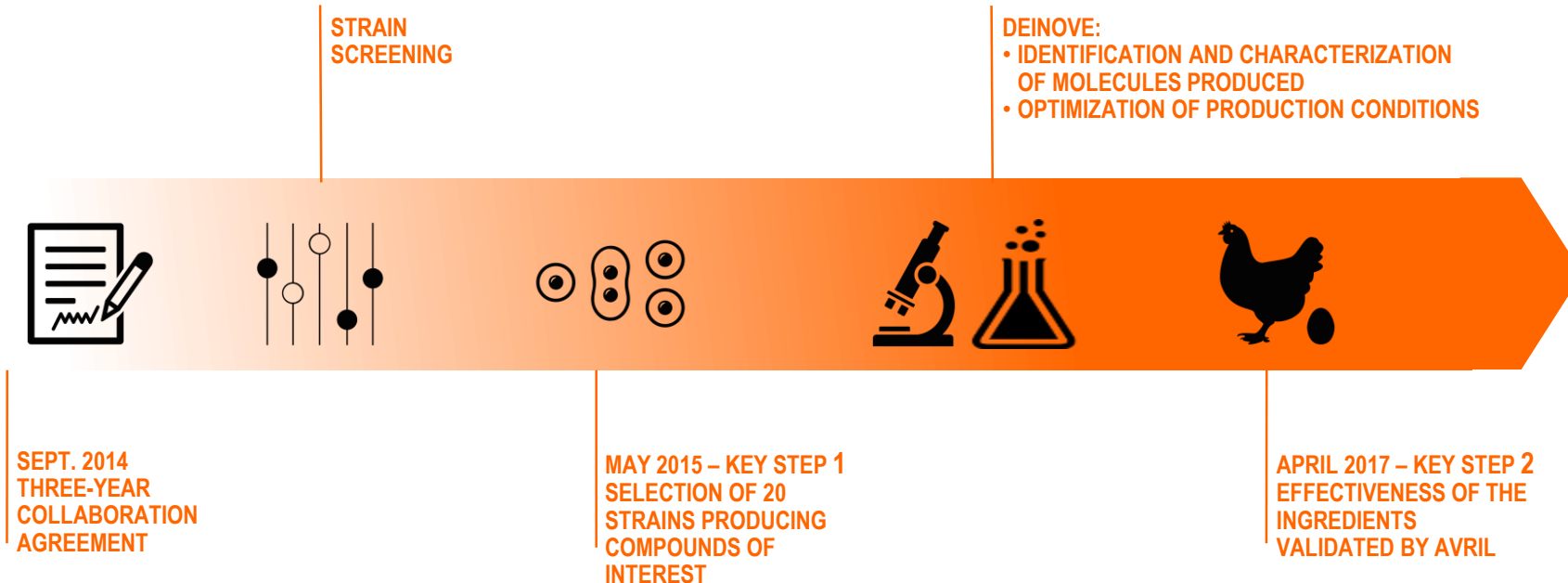
### GOAL OF THE COLLABORATION

- Avril, major player of the vegetable oils and proteins sectors
- Development of a production process for **natural feed additives**
- Co-financed by the two partners



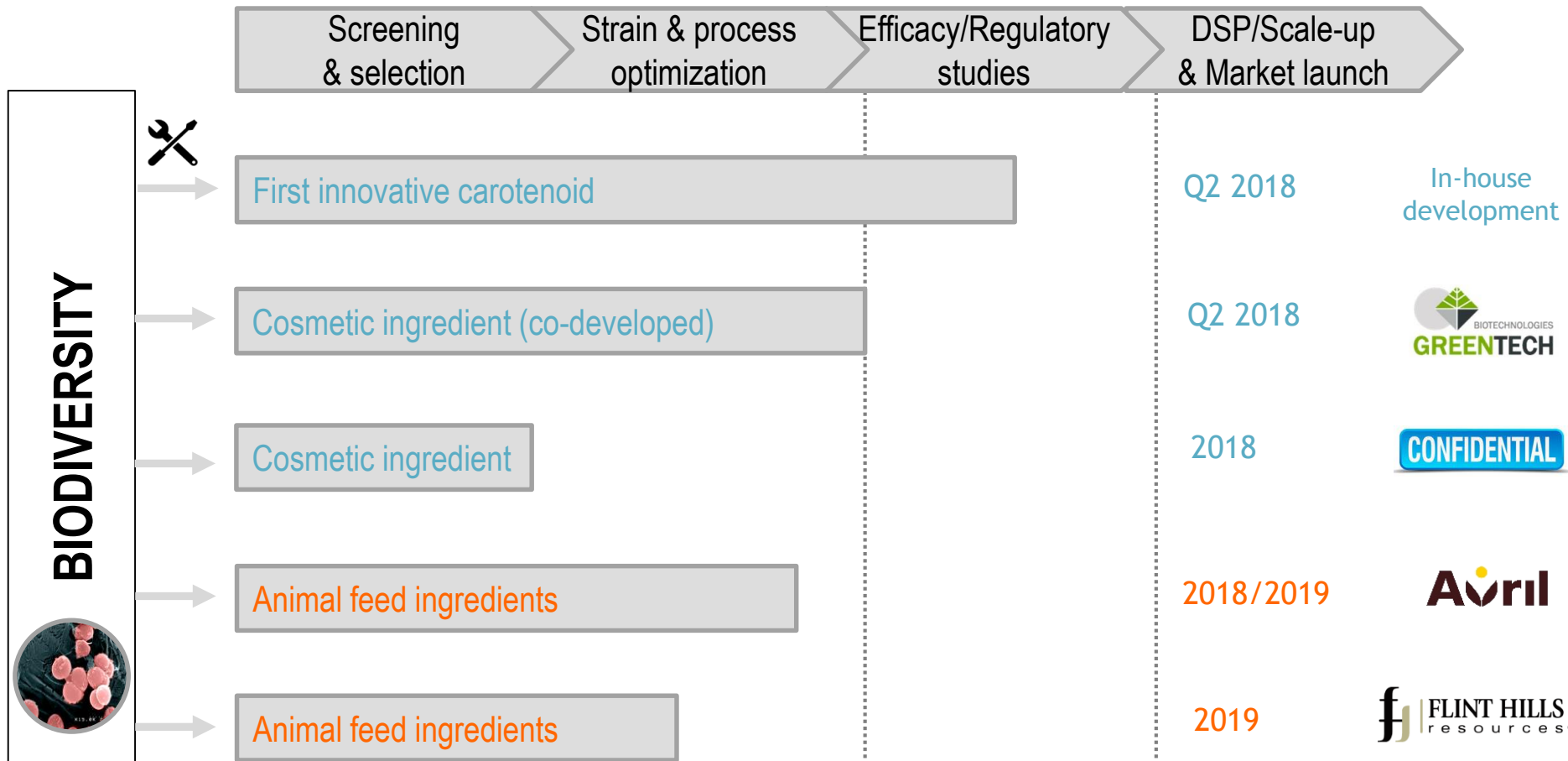
### NEXT STEPS

- Industrialize the production
- Assess the technical-economic criteria and sign the licensing agreement
- Undertake the required regulatory formalities to begin marketing these active ingredients
- Launch new animal nutrition product lines



# INDUSTRIAL BIOTECH PIPELINE

## COMMERCIALIZATION WITHIN A SHORT TIME FRAME





# BUSINESS MODEL

## FUNDING & REVENUES



# CAPITAL AND SHARE PERFORMANCE

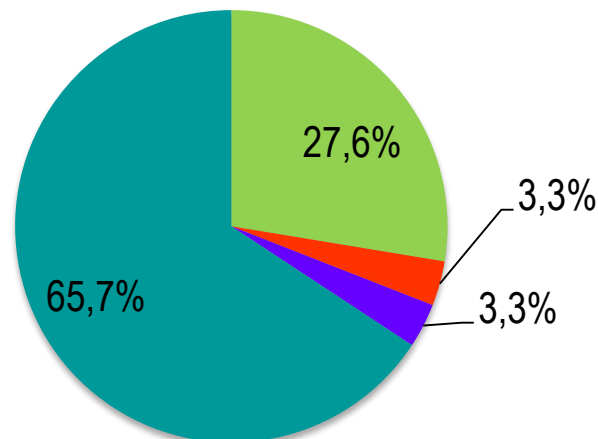
## Stock price evolution



### Market data

Market cap: €21m  
Share price: €2  
Average volume in 2017: 55,000 shares/day

## Shareholders' structure at 31.12.16 (diluted)



■ Funds managed by Truffle Capital ■ Scientific founders  
■ Management & Board members ■ Free float

Broker	Price target	Date
Edison	€4.4	01.09.17
Invest Securities	€4.4	24.09.17
Portzamparc	€5.6	29.09.16

# MAJOR ADVANCES IN THE 3 AREAS OF WORK

## 2017 NEWSFLOW HISTORY

- |             |   |
|-------------|---|
| <b>JAN</b>  | <ul style="list-style-type: none"><li>• 1<sup>st</sup> new antibiotic structure patented</li><li>• Deinobiotics becomes a fully-owned subsidiary</li></ul>  |
| <b>MAR</b>  | <ul style="list-style-type: none"><li>• Bernard SCORNEAUX joins as Preclinical Director</li><li>• Screening of 430 strains for applications in cosmetics, health and nutrition: dozens of hits identified (anti-oxidant, anti-inflammatory, healing, activity on lipid metabolism)</li><li>• Partnership with Greentech to co-develop and market a first cosmetic ingredient by end of 2018</li></ul>     |
| <b>APR</b>  | <ul style="list-style-type: none"><li>• Partnership with Avril: Phase II successfully completed - Effectiveness and bioavailability of the ingredients developed by Deinove validated =&gt; moving towards assessment of the technical-economic criteria and preparing for industrial production</li></ul>  |
| <b>MAY</b>  | <ul style="list-style-type: none"><li>• 1<sup>st</sup> patent in animal nutrition, issued in China</li><li>• Georges GAUDRIAULT joins as new Chief Scientific Officer</li><li>• Partnership with FHR (Koch industries): Phase I successfully completed - Selection of several bacterial strains from Deinove library producing the target compounds =&gt; moving towards <i>in vivo</i> testing</li></ul> |
| <b>JUL</b>  | <ul style="list-style-type: none"><li>• Carotenoids: 1 molecule selected for production on an industrial scale in 2018 and characterized (antioxidant and healing properties, safety), yield optimized on lab-scale =&gt; moving towards validation of the industrial process conditions and selection of subcontractors</li><li>• Sébastien ENAULT joins as new Head of BD</li></ul>                     |
| <b>SEPT</b> | <ul style="list-style-type: none"><li>• Antibiotics project granted 14.6M€ by 'Invest for the Future' Program</li></ul>   |

# FINANCIAL DATA – 2016

## Stable net loss: -€6.3m (vs. -€6.4m in 2015)

- > Tight control over operating expenses: +0.3%, while DEINOBIOTICS project has been fully reintegrated into DEINOVE

## Cash burn under control:

## Cash position +€9.3m (vs. +€12.4m at end of 2015)

- > Stable operating expenses: (€7,750k) ; investments (€770k) ; Subscription for DEINOBIOTICS bonds (€500k)
- > Increased income: 2<sup>nd</sup> and 3<sup>rd</sup> milestones DEINOCHEM – Ademe (€2,264k); Worldwide Innovation Challenge – Bpifrance (€140k); 4<sup>th</sup> milestone DEINOL (€948k); Research tax credit 2015 (€1,600k); revenues from collaboration agreements (€793k) - AVRIL, FHR; Equity line (€780k)
- > Cash resources to finance its projects until the end of the 1<sup>st</sup> quarter of 2018, without resorting to Tranches 3 and 4 of the equity line funding

# FINANCIAL DATA – S1 2017

## Consolidated financial statements for the first time

**Stable net loss: -€3.3m**

**Cash burn under control:**

**Cash position +€6.6m (vs. +€9.3m at end of 2016)**

- > Cash out: operating expenses (€4100k, 74% R&D) ; investments (€900k)
- > Cash in : Revenues from collaboration agreements (€140k) - AVRIL, FLINT HILLS RESOURCES ; R&D tax credit (€1253k vs. €745k S1 2016) ; Sale of Carbios shares (€500k) ; Equity line (€1200k) ; Financial resources of DEINOBIOTICS (€600k)



# DEINOVE

## REASONS TO INVEST

Help tackle important challenges for a sustainable future:

- Energy transition,
- Fight against resistance to antibiotics,
- Changes in diets because of a growing population...

Get the best of the French research

Bet on an exclusive technology that convinced leading industrial partners and independent experts

Invest in fast-growing markets



# CONTACTS



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