



Science For A Better Life



FORUM TERATEC

27/06/17

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Forward-Looking Statements

This website/release/presentation may contain forward-looking statements based on current assumptions and forecasts made by Bayer management.

Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Bayer's public reports which are available on the Bayer website at <http://www.bayer.com/>.

The company assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments.

The Bayer group worldwide Divisions



Pharmaceuticals



- Innovation on prescribed drugs
- Key indications :
 - Cardiovascular diseases
 - Oncology
 - Hematology
 - Ophthalmology
 - Contraception



Consumer Health



- Non prescribed drugs, food supplements, dermatological products, foot care and sun creams
- No. 2 worldwide, leading position on several key segments



Crop Science



- Innovative solutions for crop and seeds protection
- Solutions for non agricultural usages: green area, malaria,
- Animal health



The Bayer group in 2015-2016

Key figures



116 800
EMPLOYEES*



307
SUBSIDIARIES



TURNOVER

46,3 milliards €**



R&D EXPENSES

4,3 milliards €***

> 10% CA



France is ranking 6th for the Bayer Group concerning turnover, after the USA, Germany, China, Brazil and Japan.

On the 31st of December 2015 (including Covestro), *without Covestro : 101,000 employees (FTE)

** without Covestro 34,3 billions € - *** without Covestro : 4 billions €



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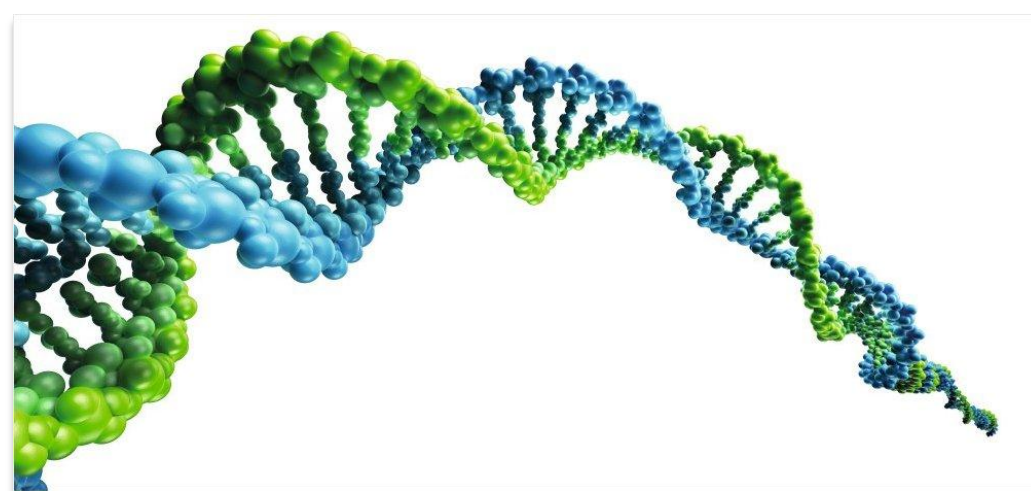
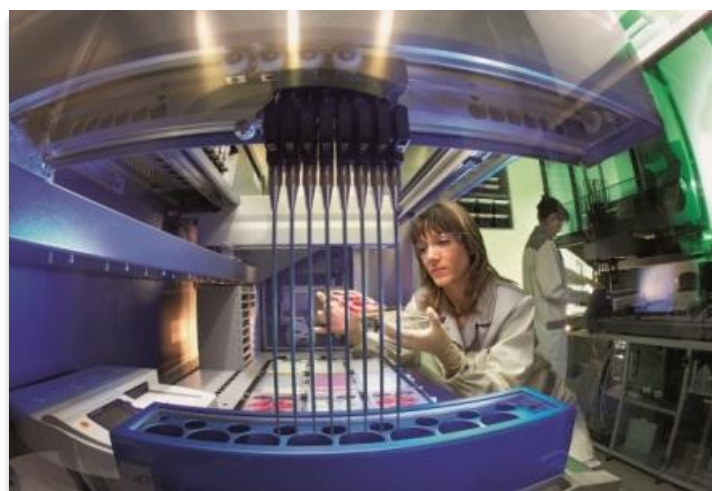
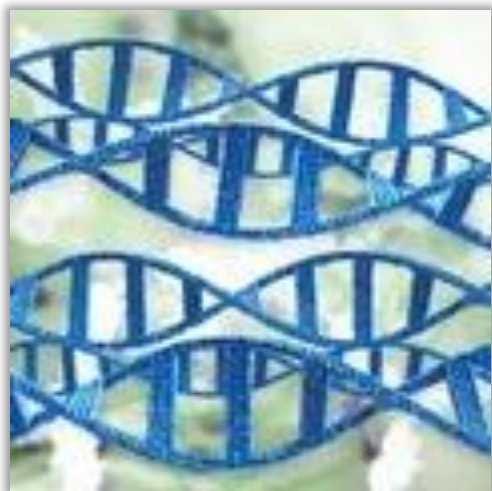
How Big Data opens new fields of innovation in Life Science,
from R&D to the development of the economy of functionality :
Bayer experience in France.

4 transformations



- Big Data opens new fields of innovation in Life Science
- Accelerate the development of product-service combinations
- New models :
 - Personalized health pathway
 - Economy of functionality
- Could reconcile society with Chemistry, Pharmacy and Agriculture.

Digital transformation allows to improve R & D processes

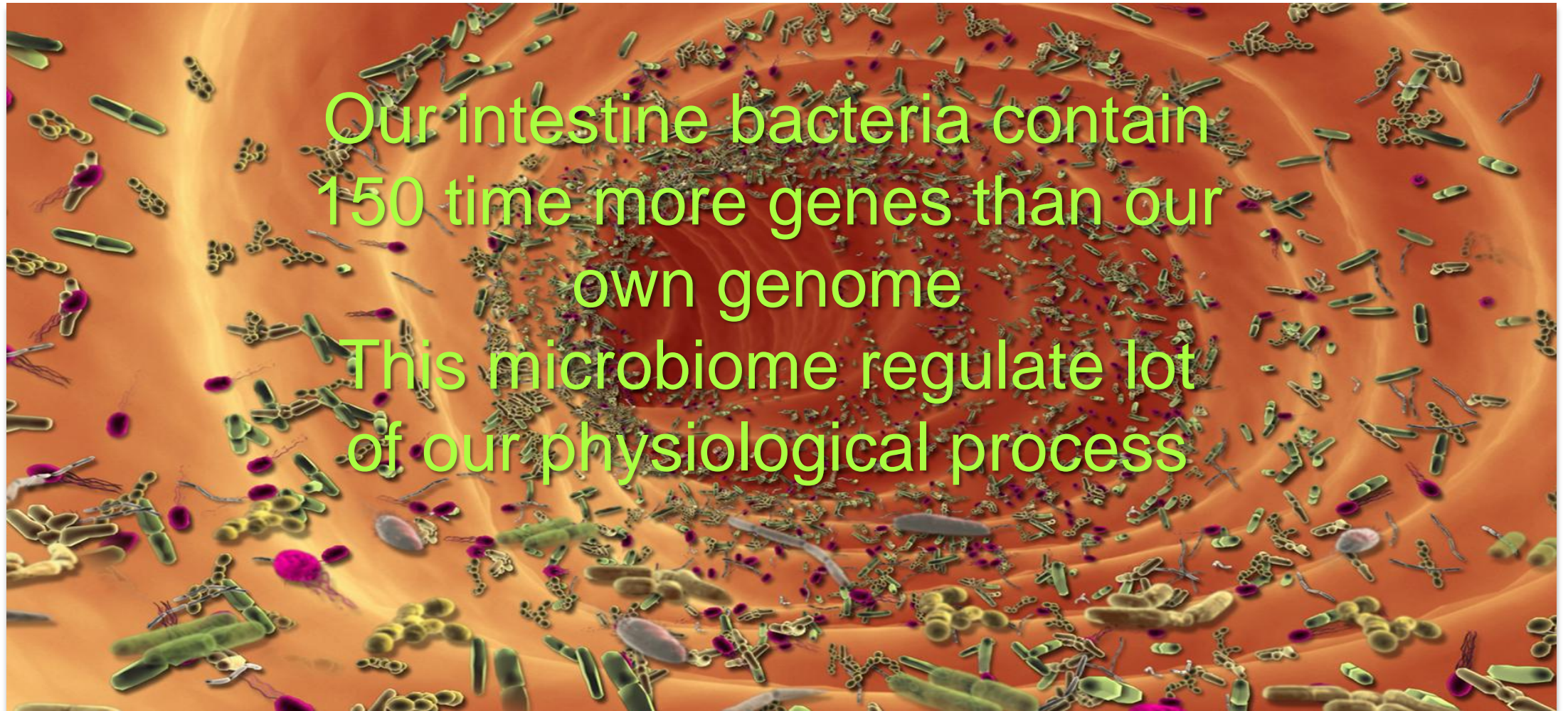


Bioanalytical Quantum Leaps



	1990	2015
Protein Characterisation	3 years	7 seconds
DNA sequencing	15 yrs (2,7 b \$)	2 hours (< 1000 \$)

The big data allows to scale-up our quest : from human genome to microbiome



Key figures of the product market development

A continuously changing process – case of agrochemicals



How long does the R&D process last, from the first molecule to the market launch?

10-12 years [11.3 ⁽¹⁾]

R&D cost for a molecule on the market ?

~286 Mio € ⁽¹⁾

How many molecules are being synthesized and tested before being launched on the market ?

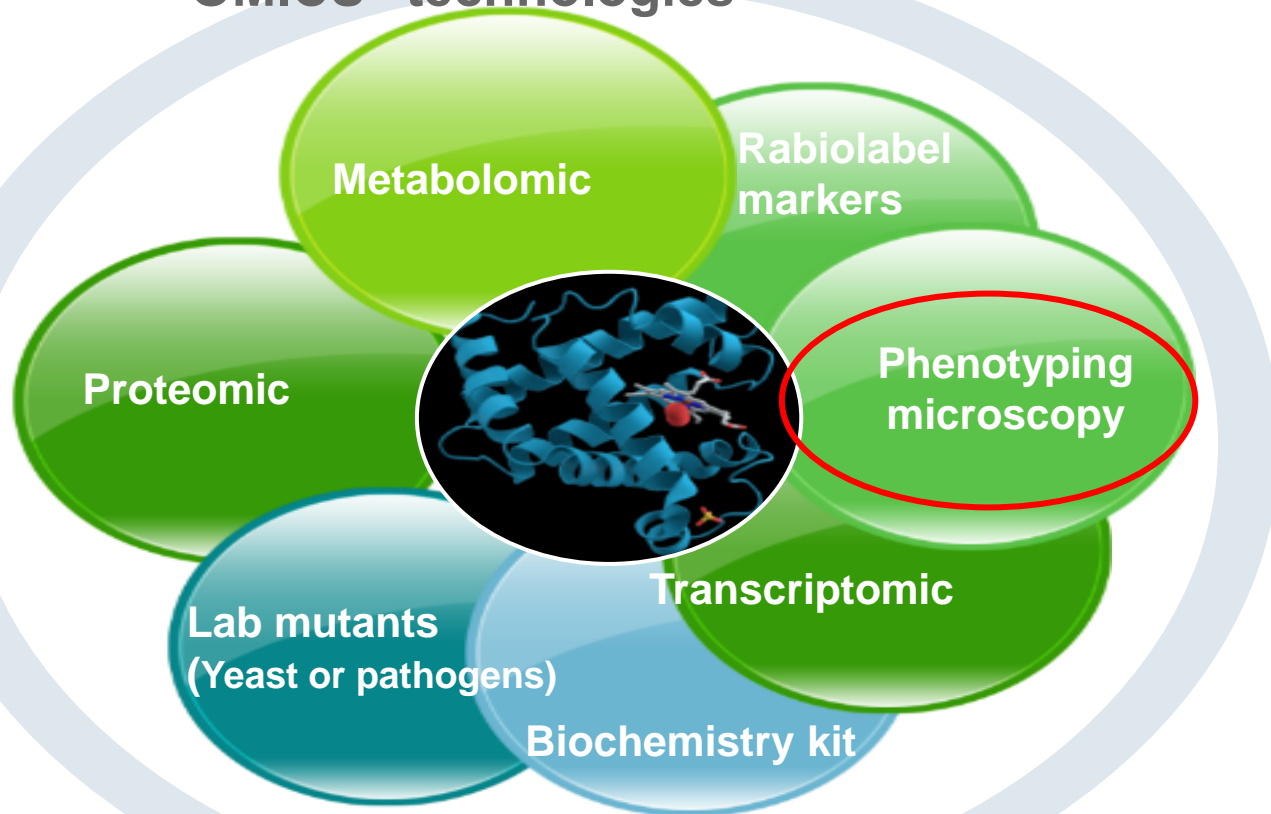
159600 ⁽¹⁾

Cost allocation between Tox./ Ecotox./ Efficiency studies ?

50 / 40 / 10

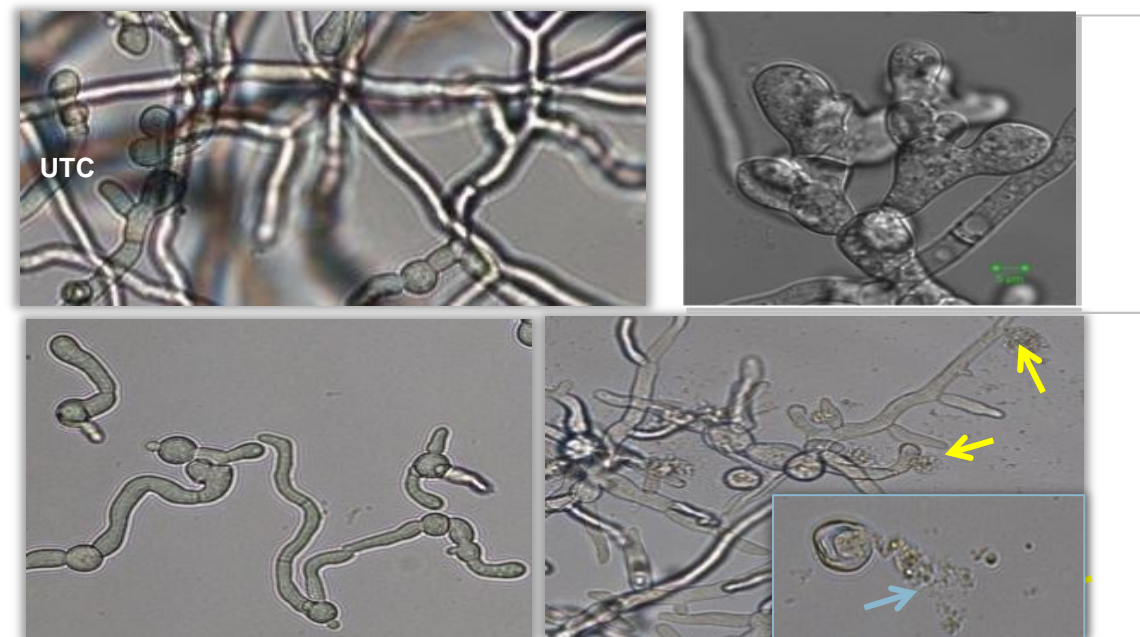
A large tool box to identify the biochemical MOA/target

“OMICS” technologies



Phenotyping and Image analysis

Transmitted light microscopy

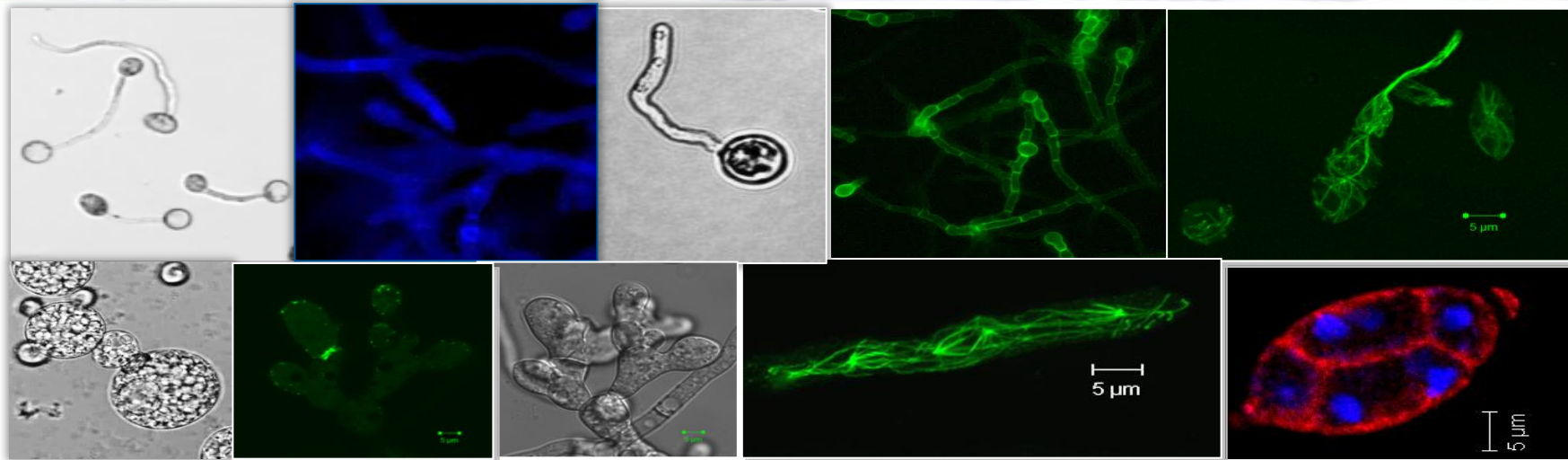


Morphological Modifications

Data mining and Data management

A phenotyping laboratory

“**Phenotyping** means to observe the morphological and biochemical modifications of an organism under the influence of environmental changes “



On the way to the biochemical MOA of a molecule

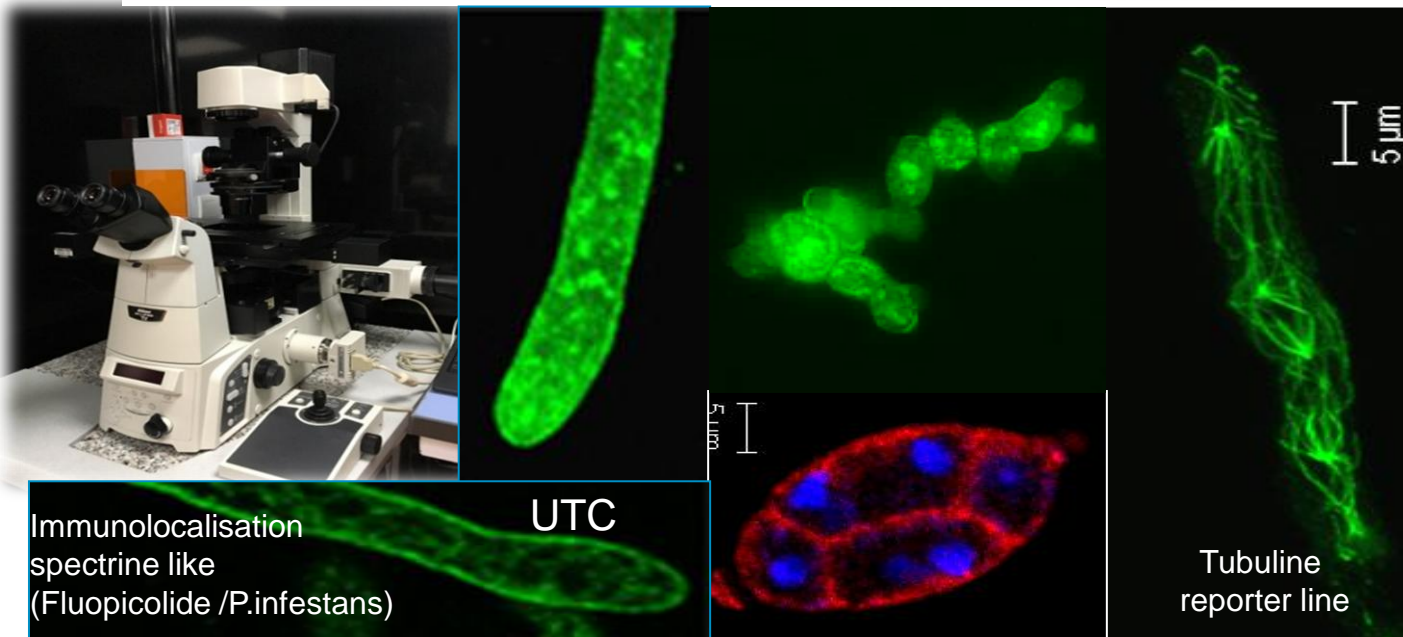
Fungi microscopic platform



Using fluorescence imaging with dedicated reporter strain or molecular probe to observe a target cellular compartment, pathway or signaling cascade.

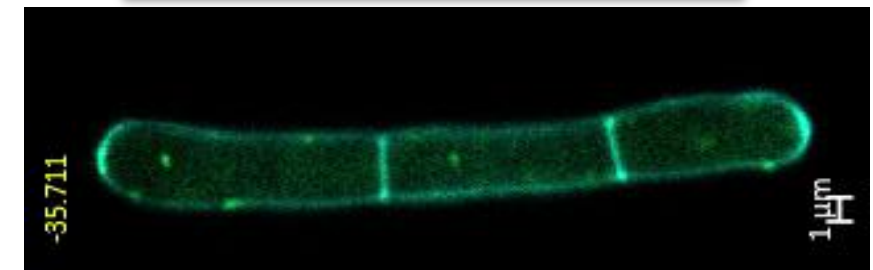
Epifluorescent microscopy

Fluorescent observations



Confocal microscopy

3D imaging



New technologies and company strategy Innovating and discovering new solutions



HealthCare



ADN editing
ARN silencing
ARN activation

Cell therapies
Microbiome



CropScience



- New therapies
- Regeneration of tissues
- Effective Seeds
-

Tomorrow, exceptional perspectives of synergies for the well-being of humans and plants



Physiology and molecular paths are identical :

- ☀ Human-Animal
- ☀ vegetal

- ☀ High Throughput screening
- ☀ Proteomic
- ☀ Metabolomic

Interaction with the consumer :

- ☀ Connected objects in Health and agriculture

A shared culture of innovation :

- ☀ In the company
- ☀ With partners and customers
- ☀ With consumers



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Emergence of product service combinations

Modulation of intra field fungicide rate dosage

Digital technology usages

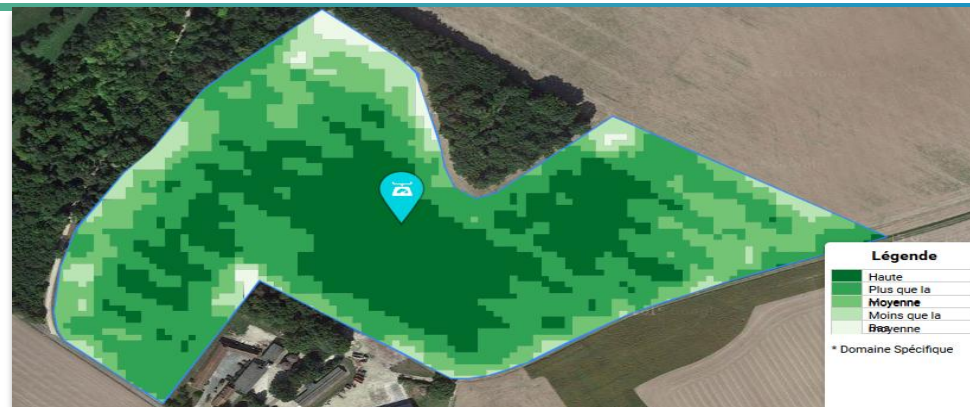


Digital Farming

Concept of intra-field dosage modulation



Satellite data is reprocessed to determine intra-field vegetation density



Biomass mapping is transformed in rate of usage



GOAL:

Bring to each foliar area the same amount of active ingredient

→ Modulation of rate of use depending on biomass

Computation of dosage linked to :

- ✓ Target yield
- ✓ Disease pressure
- ✓ Measured Biomass



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On the way to personalized medicine

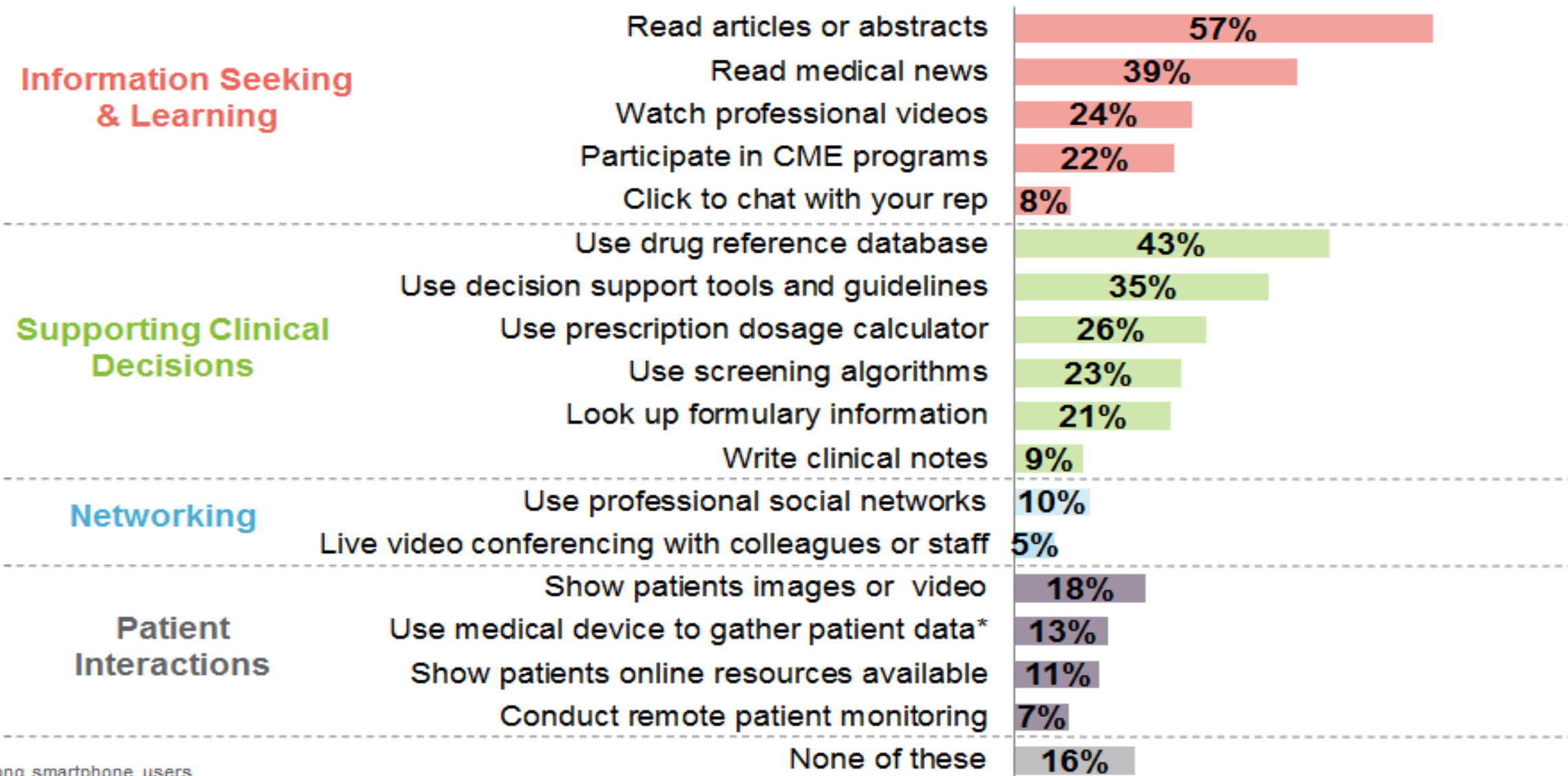
Our HCPs' world today



- Doctors are increasingly **time poor**
- They **actively search** for focused and relevant information on digital channels
- They turn to studies for **trusted information** on drug performance & security
- All the while **regulation increases**

Smartphones Key for Info-Seeking and to Support Clinical Decisions

Professional Activities Performed on a Smartphone (any use):



Among smartphone users

*An attached diagnostic or other

Source: Taking the Pulse Europe® 2015

Innovation in Pharma :

Focus on a French project



The logo for OPHITA+, featuring the word "OPHTA" in a teal color and a plus sign in a lime green color, all enclosed in a thin grey rectangular border.

An interactive platform dedicated to daily practice of ophthalmologists and orthoptists.

Site + mobile application => a very innovating concept

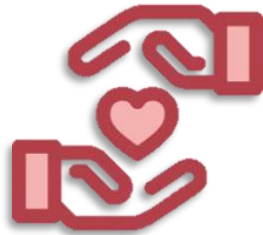
As in all consumer fields, connection with our customers brings additional value



NounouConnect

What is the purpose of the App ?

Connect & engage with customers



Create an emotional bond with moms

Develop engagement and loyalty

Drive awareness for Bepanthen

Recruit new moms & support them in their daily lives

Differentiate, innovate & personalize



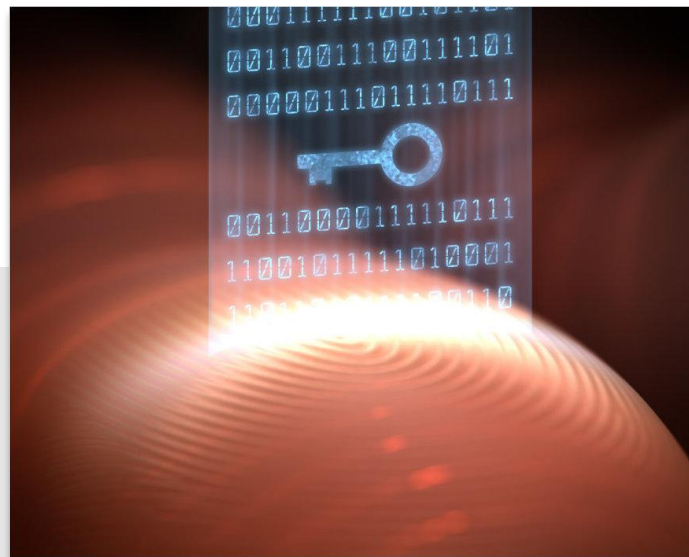
Get learnings around app development and marketing

Collect users insights

Optimize the app according to users needs

Use data to personalize advertisement & retarget users

Big data could reconcile society with Chemistry, Pharmacy and Agriculture





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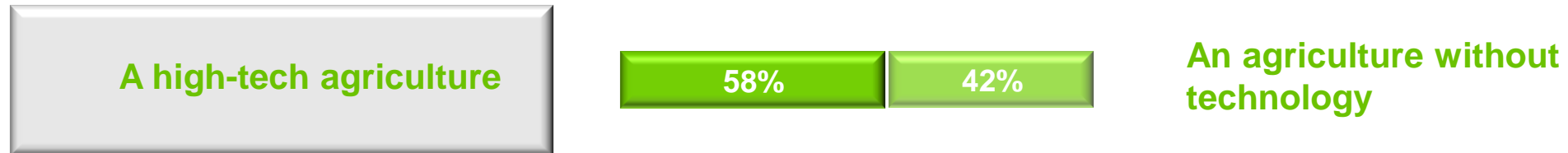


How could we reconcile agriculture and public acceptance thanks to new technologies

Crossed perceptions between farmers and population



? **Question** – If you had the choice between these two propositions, which one would you choose ?
Base : all interviewers (1 005 answerers)



Source : BVA - 2014 – quali & quanti studies

Crossed perceptions between farmers and population « Made in France » a strong reassuring factor



Reinforcement of the legal and technology parts divide even more public opinion.

? **Question** – If you had the choice between these two propositions, which one would you choose ?
Base : all interviewers (1 005 answerers)

An agriculture relying on the innovation principle

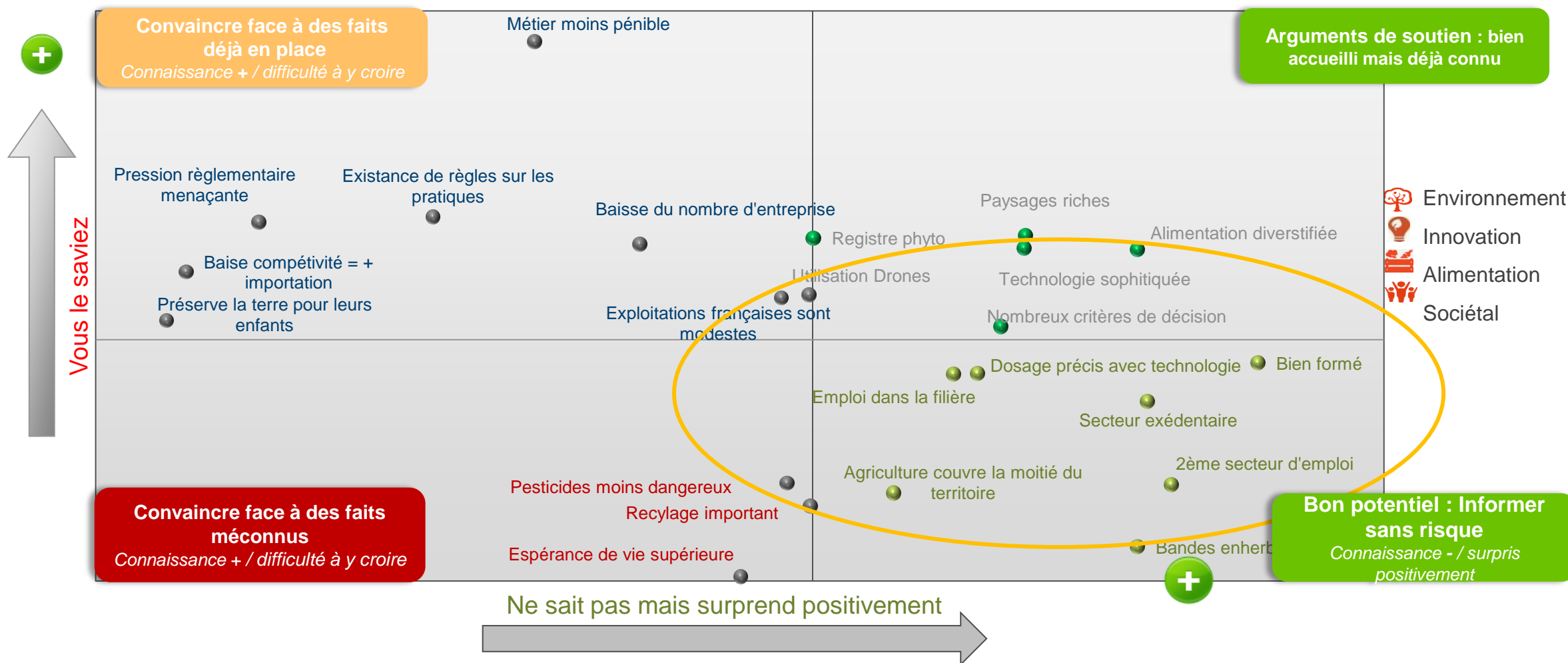


An agriculture in favor of the precautionary principle

Source : BVA - 2014 – étude quali et quanti

Crossed perceptions between farmers and public opinion

Summary of communication lines



Source : BVA - 2014 – étude quali et quanti



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Thank you!