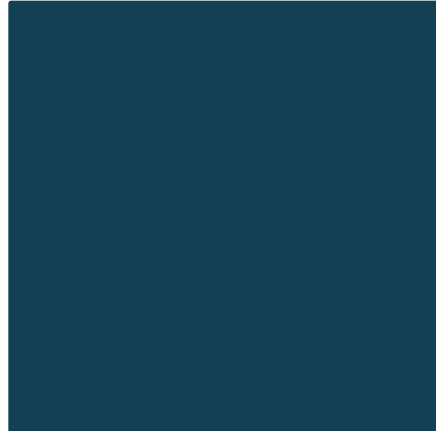


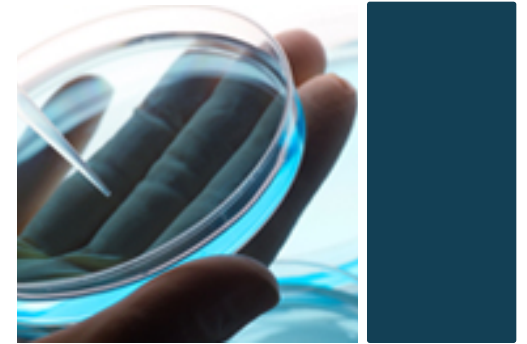


Université
de Liège



Evaluation of the microbiota with metagenetics

Agenda



- **Introduction**

- *The food microbial ecosystem*
- *-omic technology*
- *Metagenetics*
- *Case study*

- **Take home message**

- **Objectives**

- *To give an overview of the metagenomics tool available for food industries*
- *To present case study from food industries*
- *To illustrate the power of this technology to manage food quality*



Structural Interdisciplinary Research Center in Fundamental and Appplied Research for Animals & Health

Food science of the University of Liege
Analysis , Inspection, Quality, microbiology and technology



Objectives

- Research
- Teaching
- Services

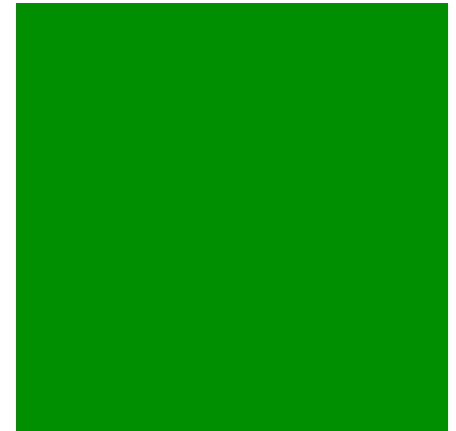
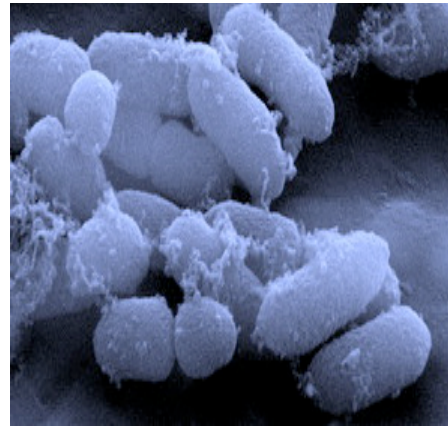
2 spin offs



Analysis, certification and inspection

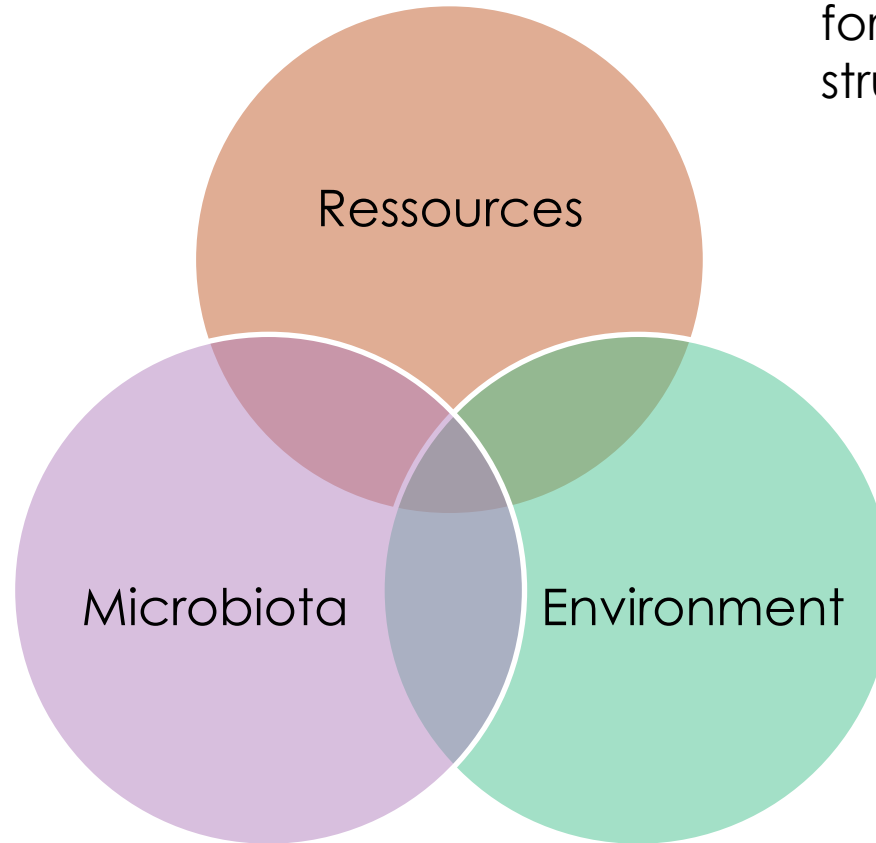


Consulting and training



The food microbial ecosystem

Microbieel ecosysteem: uitdaging



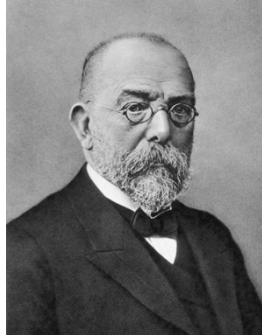
Food matrix: nutrients
for microorganisms,
structure, pH

Process:
temperature, pH,
gaz, additives, ...

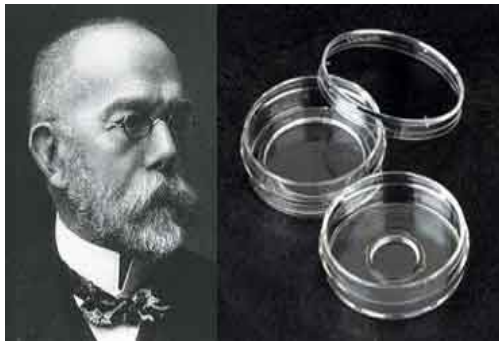
To detect, to identify, to count



Louis Pasteur,
1822-1895



Robert Koch,
1843-1910



Julius Pétri, 1852-1921

Counting



Detection

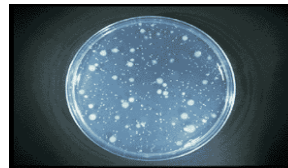


Culture step

24 h to 5 D

3-7 D

24 h



Metagenetics



A technological breakthrough

Classical approach



Metagenomics



Deposits of 2 european patents: « *Metagenomic Analysis of Samples* »
« *Detection Method* »

Metagenomics



Targeted metagenomics provides identification, in a single analysis, of several thousand micro-organisms (bacteria and yeast / molds) in one sample

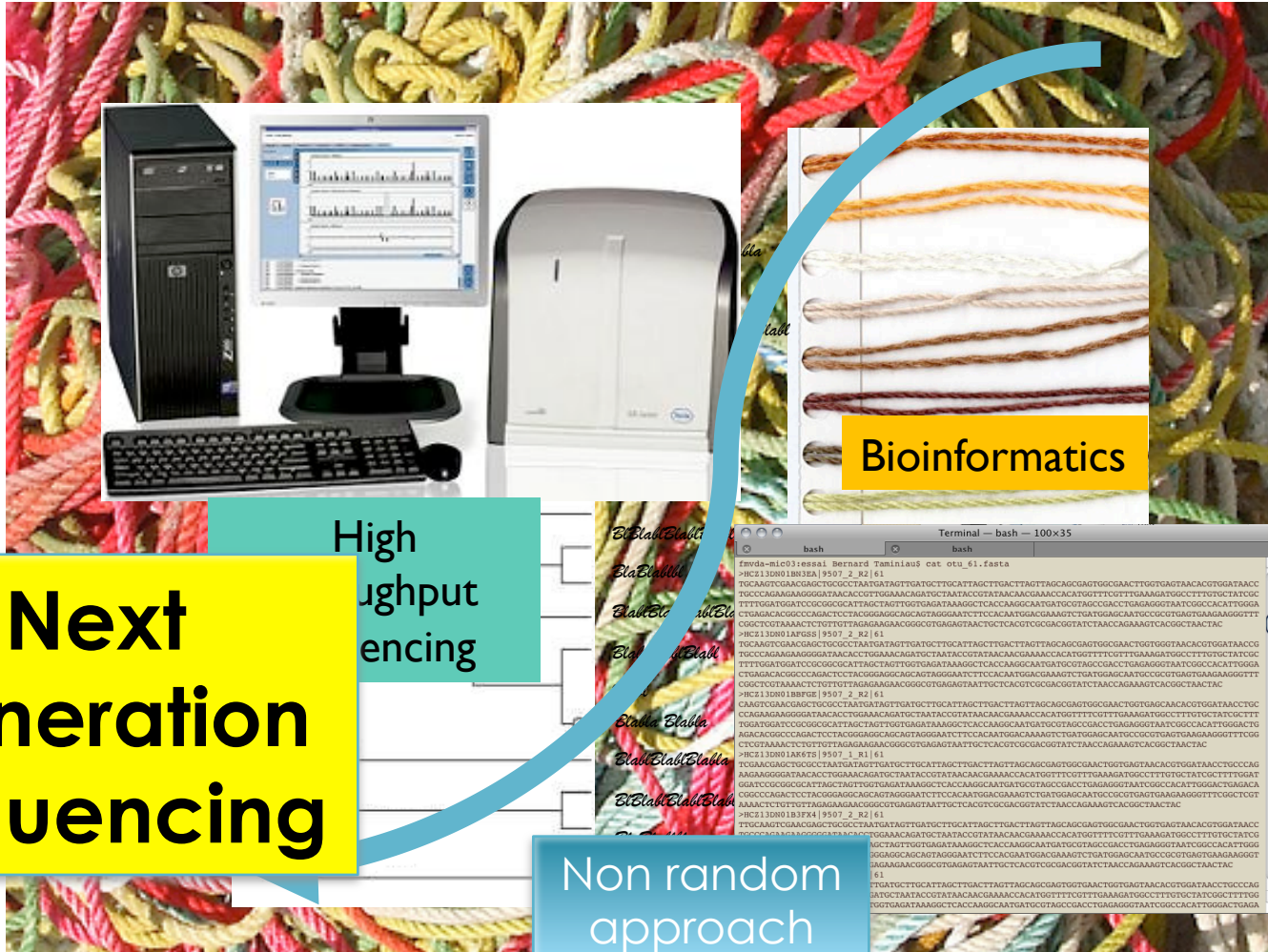
Classical approach

Work
Time consuming
Costs
Partial and biased results

Metagenomics

Many more informations
Flexible
Cost effective
Rapid

How does it work?



Biblio – Quality Partner en ULg



Advancing analytical

International Journal of Food Microbiology 191 (2014) 157–163

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<http://dx.doi.org/10.3168/jds.2014-8225>
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Microbiota characterization of a Belgian protected designation of origin cheese, Herve cheese, using metagenomic analysis

V. Delcenserie,^{*1,2} B. Taminiau,^{*1} L. Delhalle,[†] C. Nezer,[†] P. Doyen,^{*} S. Crevecoeur,^{*} D. Roussey,[‡] N. Korsak,^{*} and G. Daube^{*}

^{*}Fundamental and Applied Research for Animal & Health (FARAH), Food Science Department, Faculty of Veterinary Medicine, University of Liège, Sart-Tilman, B43b Liège, B-4000 Belgium

[†]Quality Partner S.A., Rue Hayeneux, 62 4040 Herstal, Belgium

[‡]Herve Société, Rue de Charneux, 4650 Herve, Belgium

^a LFMFF

^b Coupure

^c Labor

^d Qualit

r
t

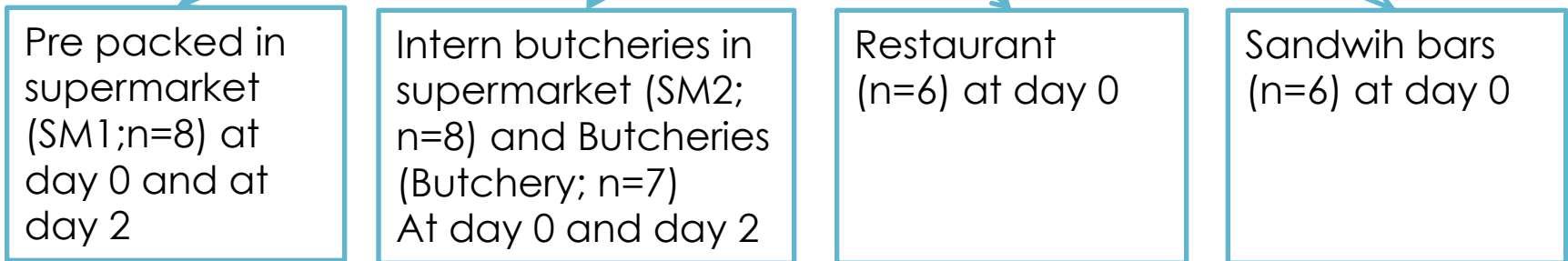
Tod
qua
con
spe
con
pro

Short
Psy
rec
and
Vasil

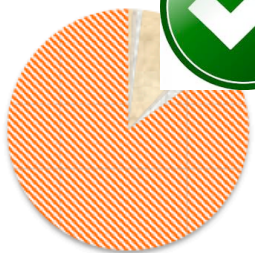
Study : The microbiota of steak tartare from different origin



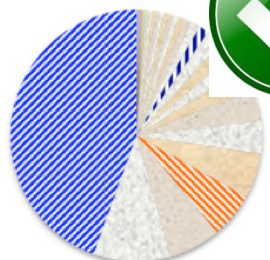
n=59



GROUP I












Group II

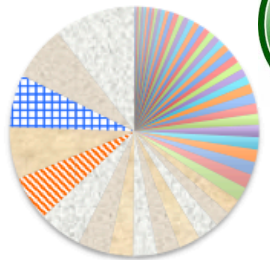


GROUP III

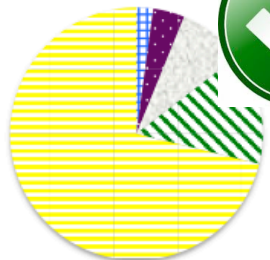


-  *Brochothrix thermosphacta*
-  *Clostridium haemolyticum*
-  *Lactobacillus algidus*
-  *Lactococcus piscium*
-  *Leuconostoc gelidum*
-  *Phobacterium kishitanii*
-  *Pseudomonas antarctica*
-  *Streptococcus thermophilus*
-  *Xanthomonas oryzae*

GROUP IV



GROUP V



Group VI



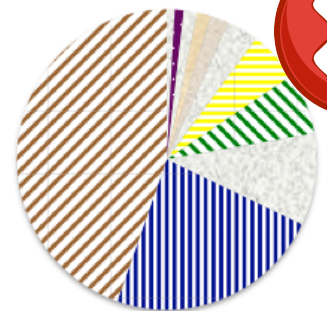
Group VII



Group VIII

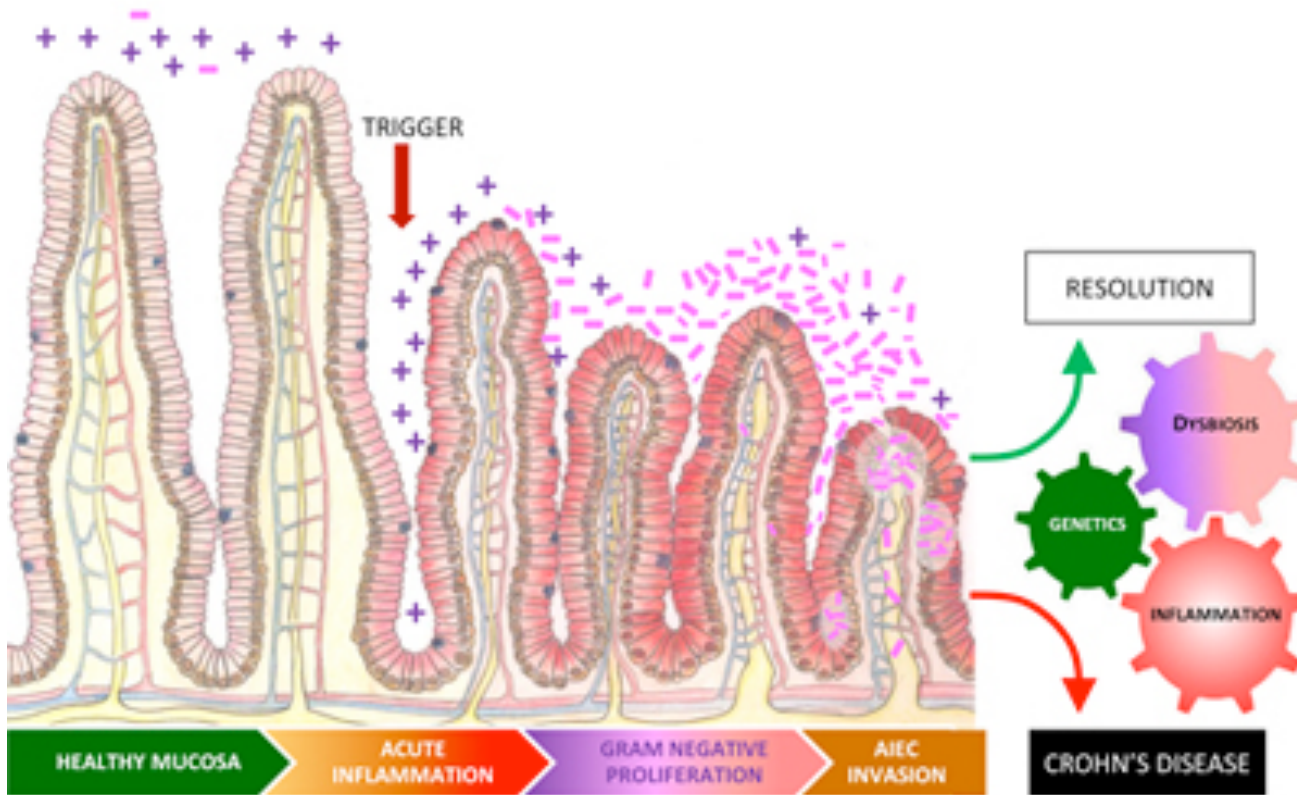
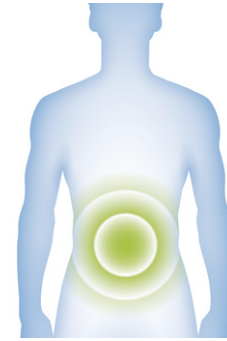


Group IX



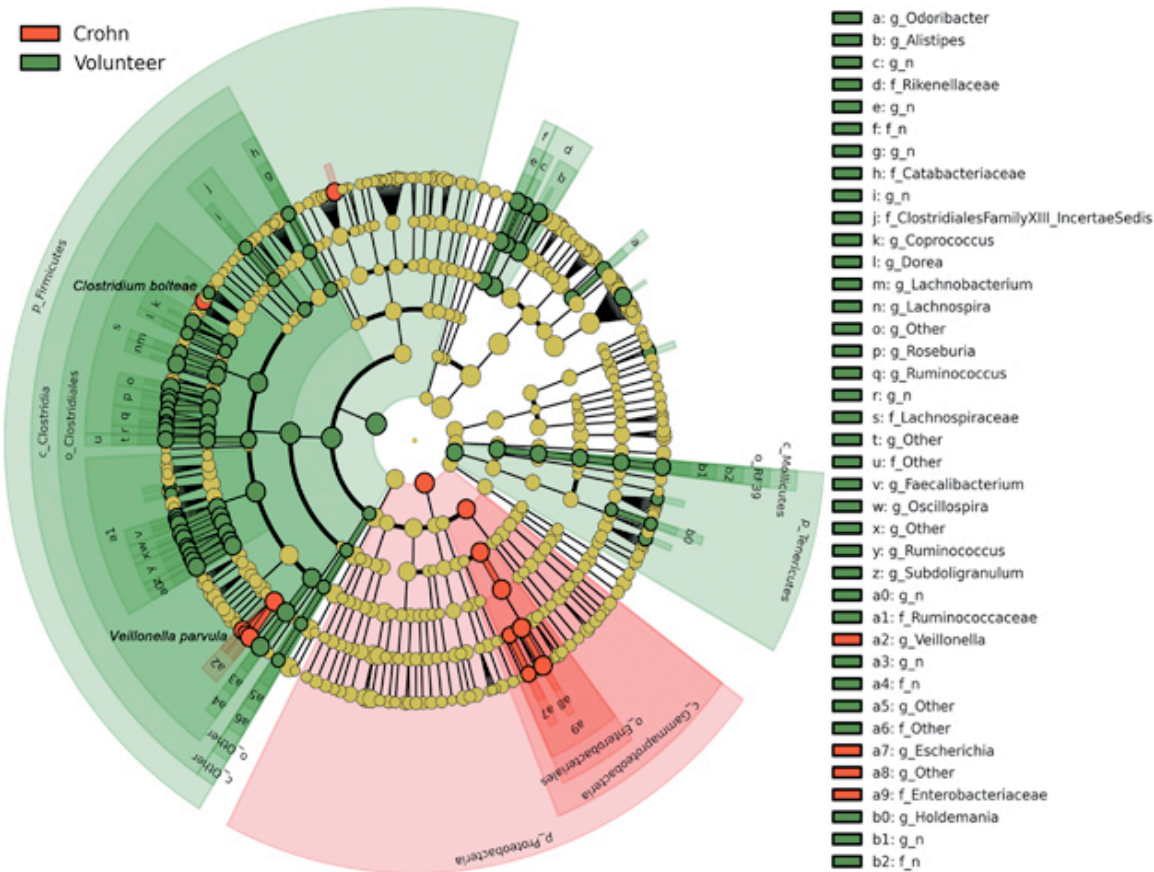
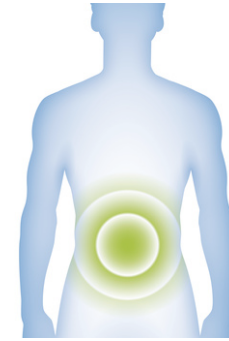
Case study 2: Human

Intestinal tract: Crohn 's disease



Case study 2: Human

Intestinal tract: Crohn 's disease



Applications

Scope



Food

- Quality control
- Innovation
- R&D, Détermination or extension of the shelf life

Animals

- Feed
- Pre and probiotics
- Intestinal tract

Cosmetics and phamaceutics

- Quality control
- Innovation
- Determination of the shelf life

Human

- Intestinal tract (ex: Crohn disease)
- Cohort studies
- Pre and probiotics

Environment

- Water
- Soils
- Plant, seeds

Take home message

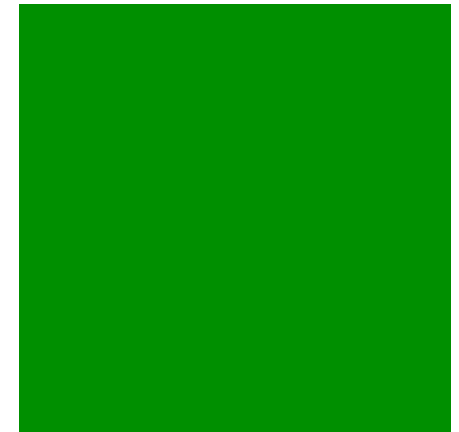


- A new starting era for microbiology
- A revisited vision of ecosystems
- Already available for food industries (QC, innovation, trouble shooting), clinical studies, pharmaceuticals, etc

We search

- Collaboration, industrial partners, investments

Contact



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