



EXPANDING CREATIVITY, ADDING VALUE, TOGETHER.

**BIOASTER PRESENTATION  
TO BIOTUESDAY, NOV 7 2017**

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# BIOASTER at a Glance

- Created in 2012, BIOASTER is a **Technological Research Institute** dedicated to **Microbiology** and **Infectious Diseases**
- BIOASTER is a private **non-for-profit** Foundation for Scientific Cooperation
- BIOASTER promotes **Translational Research** between academia knowledge and industrial needs
- BIOASTER builds national or international **Research Programs** by associating **public and private partners and funding**
- BIOASTER leads and **co-funds Technological Research Programs** that are of **high medical, technological and economical added-value**

# 2 sites in France, 120+ People



## BIOASTER Lyon (Headquarters, 3600 m<sup>2</sup>)

- BSL2 & BSL3 Laboratories
- Access to the largest BSL4 in Europe
- Dedicated collaborative spaces



## BIOASTER Paris (Institut Pasteur Campus, 600 m<sup>2</sup>)

- BSL2 Laboratories
- Dedicated collaborative spaces



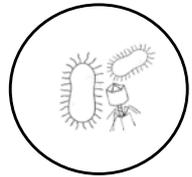
**Our Team**

## 120+ people

- Origins: 60% private, 40% academic
- 70% of PhD & Bac+5 (international curriculum)
- 17 citizenships: Europe, Asia, Africa, Americas

# An integrated approach

## 4 Programs & 7 Technological Units



### MICROBIOTA

1. Exploration: microbiote composition, host-microbiota interactions
2. Development: protocols and methods, industrial applications
3. Validation: predictive models & clinical studies set-up



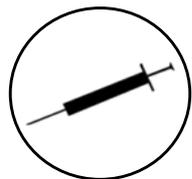
### DIAGNOSTIC

1. Biomarkers: new markers identification, candidate markers/panels evaluation, signature refinement
2. Assay development: sample preparation, prototypes development and validation (performances, repeatability and robustness)
3. Sample collection: clinical network management, biological specimens and ethical constraints



### ANTIMICROBIALS

1. Identification & characterization of new drugs
2. Host-pathogens & host-drugs interactions
3. Support to alternative approaches



### VACCINES

1. Healthy vs sick population biomarker identification
2. New vaccines/adjuvants mode of actions
3. Production and quality control development

### 7 Technological Units

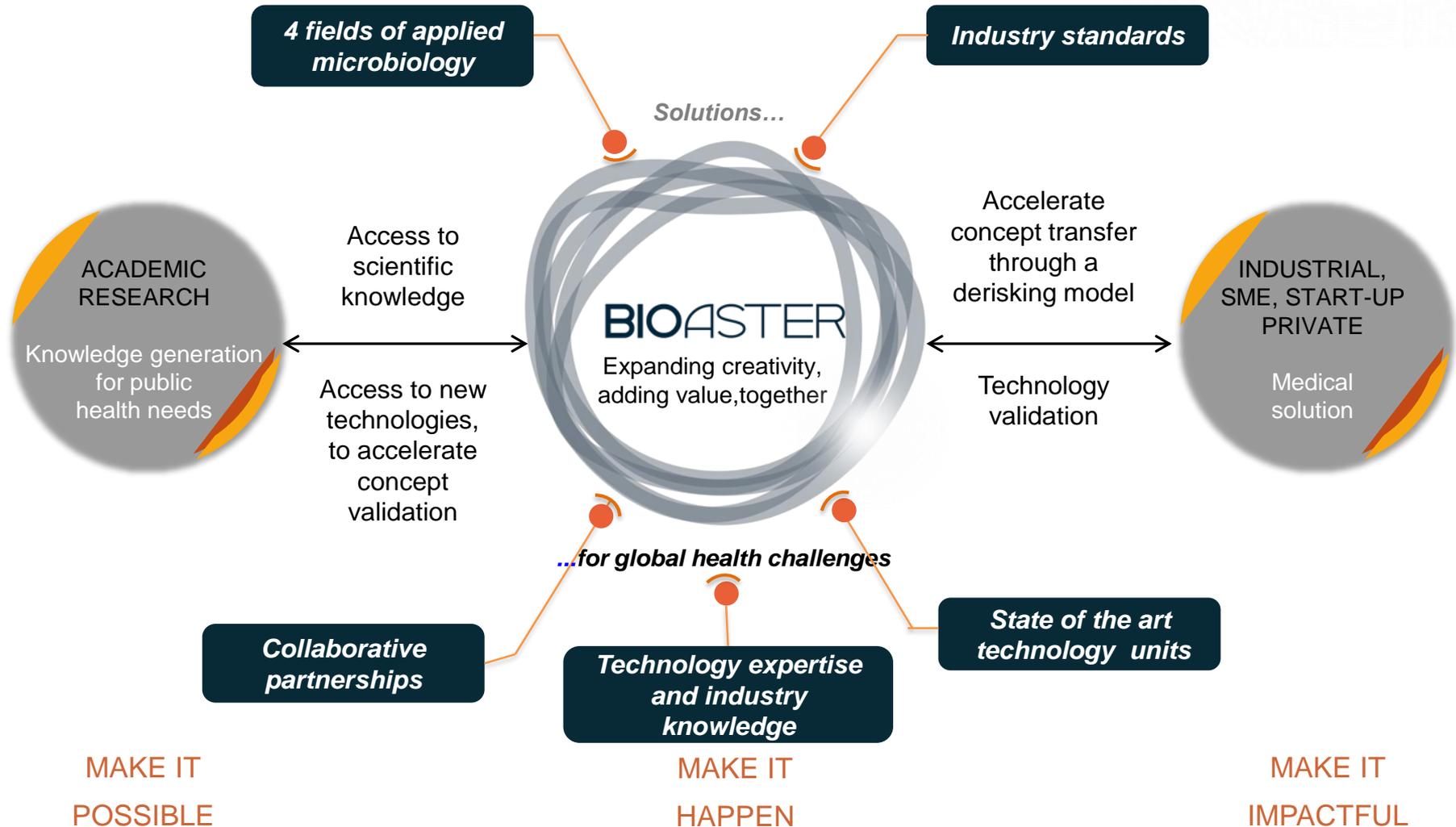
*(industrial standards)*

- Biological Collections & Microbiology
- Genomics & Transcriptomics
- Metabolomics & Proteomics
- Immunomonitoring
- Expression systems proteins engineering
- Pre-clinical models & Imaging
- Data Management & Analysis

# Technology units - overview

- ★ **BIOLOGICAL COLLECTIONS & MICROBIOLOGY**
  - Single point of access to biological samples (<https://biospecimens.bioaster.org/>)
  - Isolation and extensive characterization of microbiological strains
  - Sample prep for gut microbiota analysis
- ★ **GENOMICS & TRANSCRIPTOMICS**
  - Microbial genomics (*de novo*, resequencing); metagenomics (target, WGS), transcriptomics (host/pathogen, mode of action),
  - *NGS, microarrays, HT validation systems, qPCR, dPCR, pre-analytical steps automation*
- ★ **METABOLOMICS & PROTEOMICS**
  - Integrated metabolome / metaboproteome analysis. Profiling, fingerprinting, fluxomics, targeted analysis, lipidomics etc.
  - *600 MHz NMR, high resolution mass spectrometry, pre-analytical automation, chemometrics & bioinformatics*
- ★ **IMMUNOMONITORING**
  - Biomarker discovery and monitoring.
  - Custom assay development
  - *Flow, mass, image cytometry, fluorospot, Luminex, microfluidics, sample processing*
- ★ **PROTEIN & EXPRESSION SYSTEM ENGINEERING**
  - Novel tools for biotherapeutics and diagnostics
  - *Protein design, vectorization tools, host optimization and new host discovery, multimers, VLP, scaffolds, antibody engineering*
- ★ **PRE-CLINICAL MODELS & IMAGING**
  - Specific microbiota & infectious-based models
  - *Gnotobiology, host-microbiota interactions, infectious diseases, cell and molecular biology in vivo and 2D/3D imaging and biodistribution*
- ★ **DATA MANAGEMENT & ANALYSIS**
  - Management, transversal analysis and integration of clinical, phenotypic and multi-omic experimental data
  - *Massive data storage and intensive computing (Cloud-based HPC, Grid-computing), collaborative platforms (LIMS, eCRF, bioinformatics web platforms, tranSMART...), integrated knowledge management*

# How does it work ?



# De-risking innovation

## Expanding Creativity, Adding Value, together

- 
**Scientific de-risking**  
 Through the combination of academic and industrial expertise in science, technology and development
- 
**Technological de-risking**  
 Through the combination of state of the art equipment operated under industry standards
- 
**Financial de-risking**  
 Through co-investment (project-by-project basis)

Number of projects



47

Academic & clinical partners



20

Industrial partners



24

Average project budget (M€)



1,6

Average project duration (years)



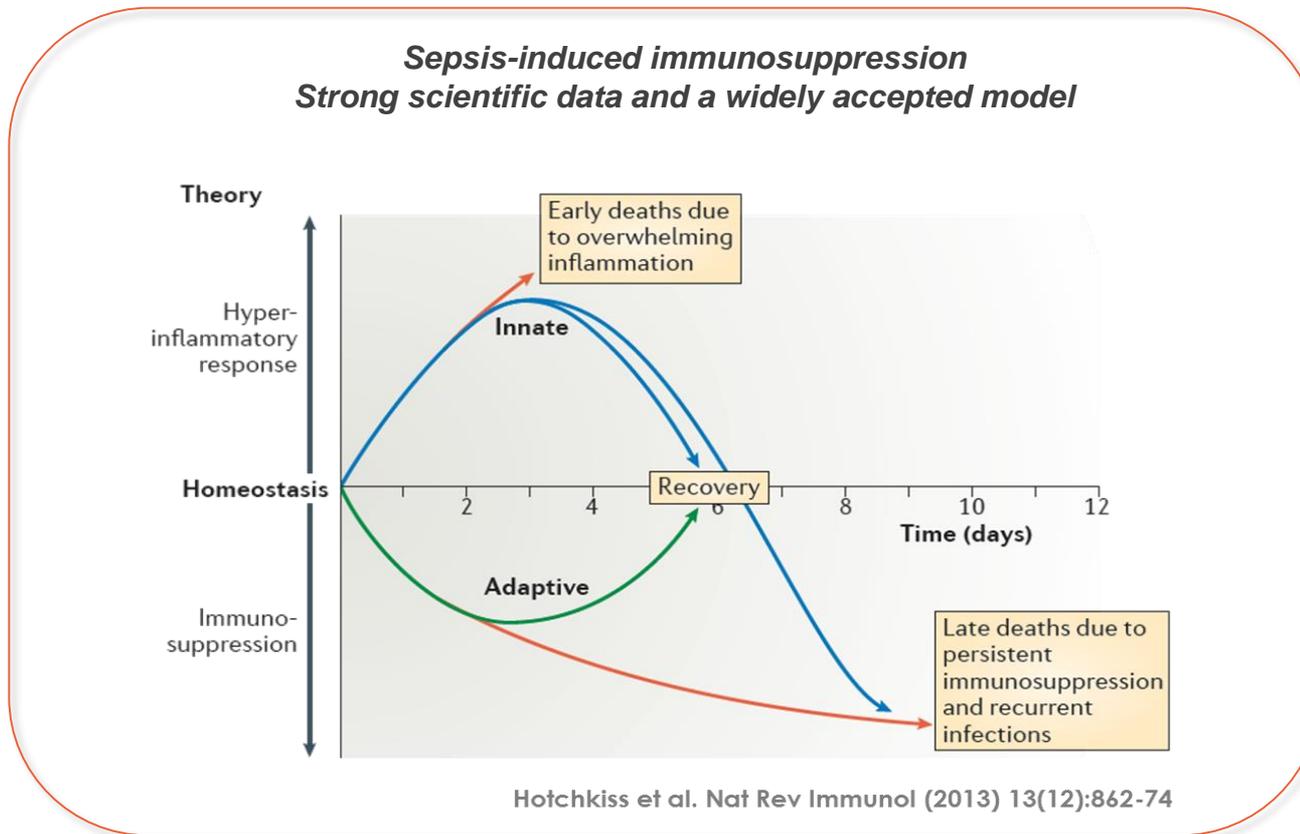
2,5

# Projects *Examples*

# REALISM

## REAnimation Low Immune Status Markers

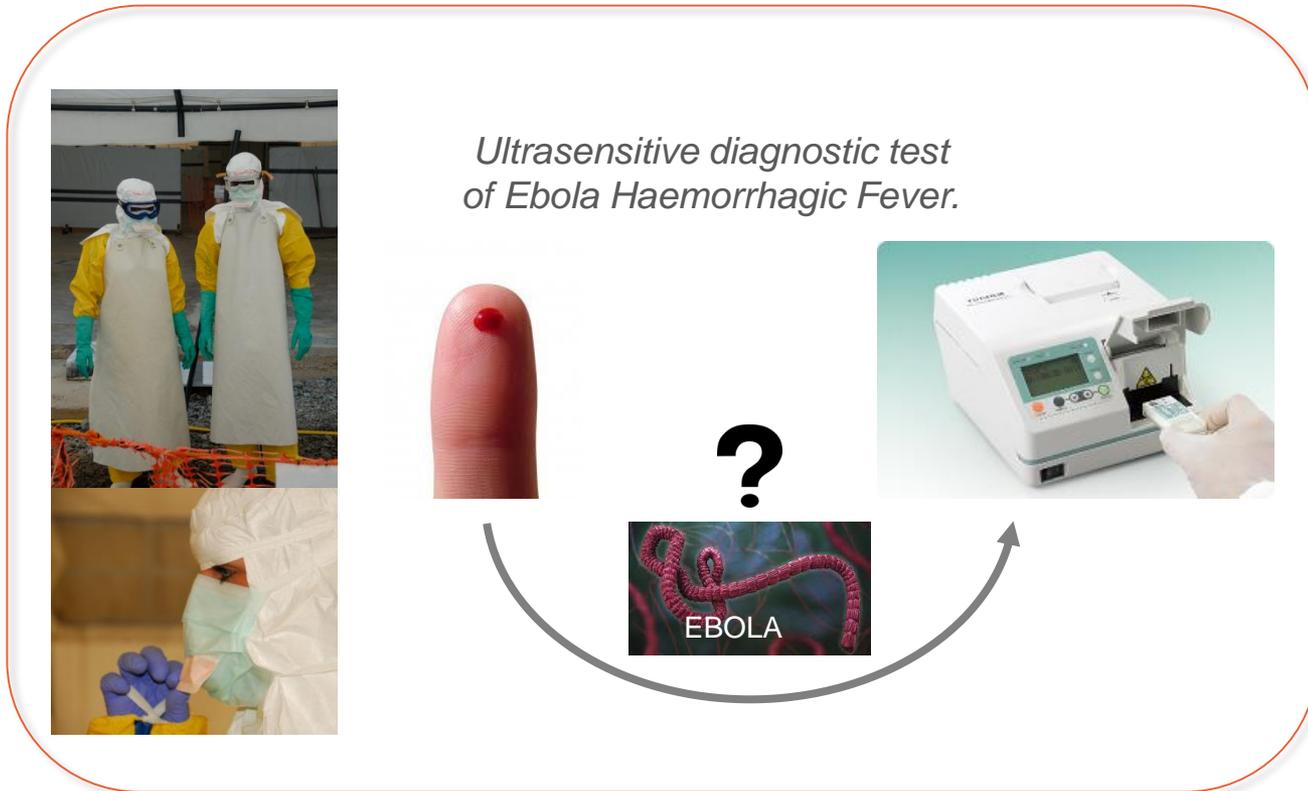
- Monitor the immuno-inflammatory status of ICU patients and provide new innovative biomarkers for Infectious risk assessment and new therapeutic approaches



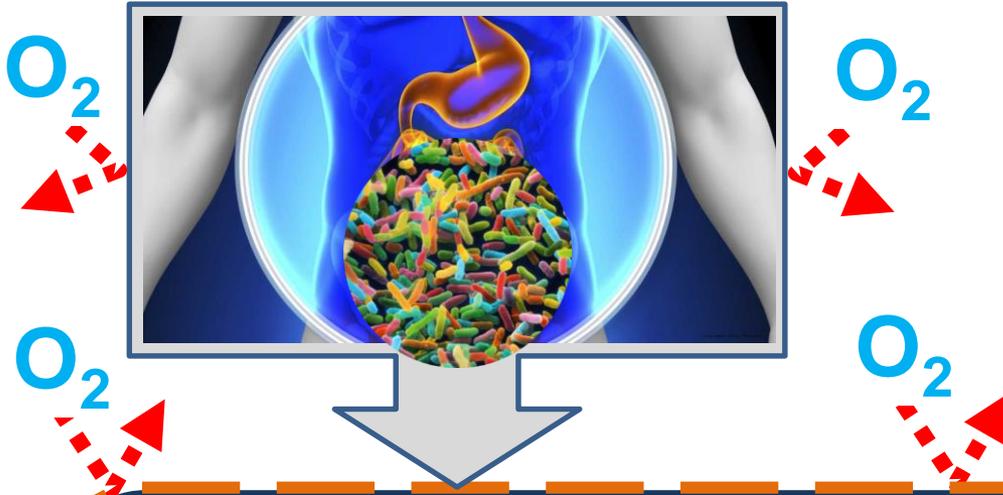
# EBODIAG

*an EBOLA Diagnostic Point Of Care test*

- Define a sensitive immunochromatographic (lateral flow) rapid test to diagnose Ebola infection in endemic countries.

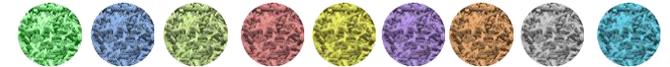


## Intestinal (or other) microbiota



## Application fields

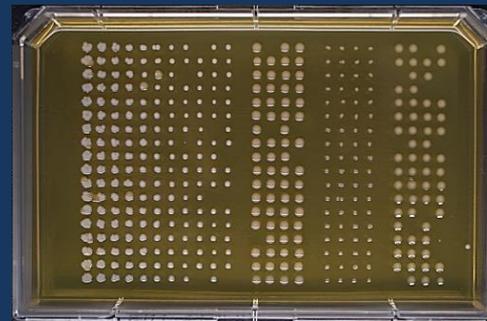
- ✓ Human health,
- ✓ Animal health/breeding,
- ✓ Animal models...



Isolated and characterized strains



*Target, Sort, Isolate*

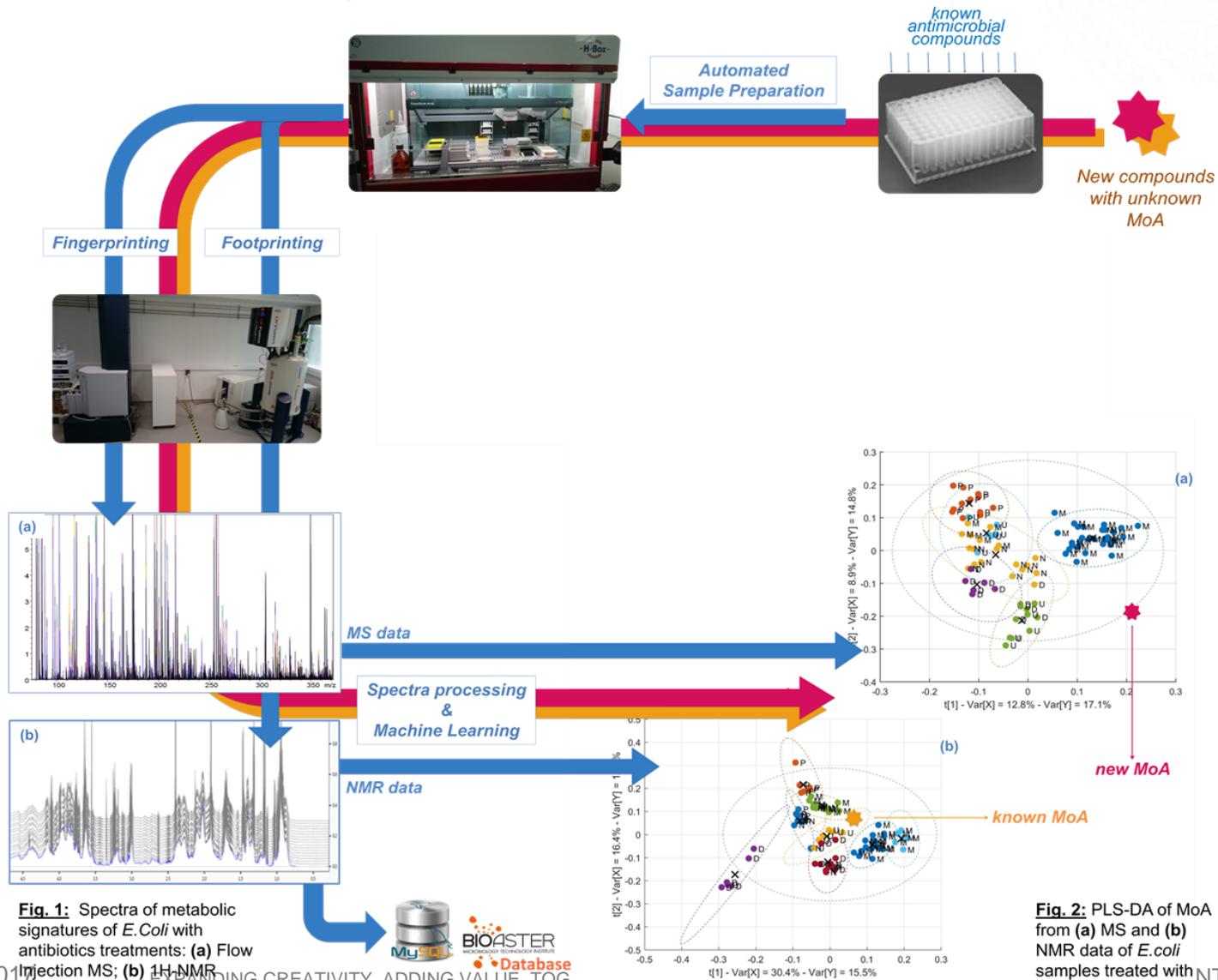


*Cultivation & identification*

*Phenotypic and genomic characterization, Immunoreactivity*

# Met-SAMoA

## Metabolic Screening of Antimicrobial Mode of Action





[www.bioaster.org](http://www.bioaster.org)



AUVERGNE – Rhône-Alpes

GRANDLYON  
la métropole



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