



This document gives a non confidential vision of Biomillenia's capabilities and is not intented to be a scientific presentation

institut**Curie** 

Biomillenia

# **Company Profile**

Based in Paris area since 2015, affiliate of Design Pharmaceuticals Inc. •

UNIVERSITÉ DE

Makes in "millions" what traditional microbiology labs make in "thousands", thanks to microfluidics / "lab on an chip" technologies .

STRASBOURG







Member since 2021





• Replacing microtiterplates and petri dishes by 20-pl droplets



- Single cells are incorporated into single droplets, generating millions of parallel cultures
- Culturomics: anaerobic, aerobic, temperature, multiple growth media, mixing...

### Droplet generation and screening





#### Compatible with: bacteria – yeast – microalgae – compounds – human cells



### Lab experimentations, at droplet scale



• Adding reagents



• Mixing



• Incubating



• Droplets reloading



• Multiple screening rounds



• Droplet merging



# Technology – High throughput assays



#### HANDMADE PETRI DISH



#### LAB AUTOMATION



#### **MICROFLUIDICS CHIP**



- Millions of mostly monoclonal cultures in parallel
- High throuput screening: 8000 droplets per second
- Dynamic assays: mixing, merging, reagent adding, multiple screenings...
- Tens of culture media on one chip
- Aerobic, anaerobic
- Adaptable droplet size from 20 picoliters to 10 nanoliters
- ...





### Direct evolution of fungi expressed with cellolytic enzymes





- This project is aiming to screening out a non-GMO filamentous fungi that secrets various cellulolytic enzymes as an additive for animal feeds.
- Established the full microfluidic workflow for screening of filamentous fungi expressed cellulytic enzyme
  - Growth of fungi in droplets
  - Optimization of incubation time and condition in droplets
  - Assay development and validation in droplets
  - Development of droplet making and droplet sorting microfluidic chips
  - Identification of selected strains
  - Performed total 8 rounds screening, 100 000 droplets for each screening

### Examples of applications



#### **APPLICATIONS**

- Cell banking
- Inibition assays ( cell vs cell, compound vs cell, whole microbiota vs cell... )
- Bioprocess optimisation / non-GMO optimisation
- Live microbiota modelling, leading to high throughput screening
- Customized assays by our team of experts in microfluidics, microbiology, molecular biology and bioinformatics

#### ASSAYS

- Antagonism ( ex : inhibition assays)
- Sensibility (ex: impact of a library of coumpound on X microorganisms)
- Binding assays
- Viscosity
- Any assay where fluorescent dyes can be used
- Secretion of compounds with fluorescent characteristics (ex: Riboflavin)
- Isolation of defined species ( using culturomics)

#### WE OFFER FULLY INTEGRATED SERVICES





Maxence Desjonquères Head of BD

m.desjonqueres@biomillenia.com



# Thanks for your attention