tebubio

Facilitators of Life Sciences Research

Biological samples solutions : the challenges of *in vitro* models

Romain Goulay, PhD - CSO

25/06/2024

We facilitate Life Sciences Research everyday

and contribute to a brighter future

We are Pan-European

- Founded in 1953
- Family-owned
- 100+ Employees
- Local offices across Europe

We Act for Life Sciences

- Innovation is in our DNA
- Contract Research Services Lab
- Part of EU Life Sciences ecosystems

Italiadomani
PIANO NAZIONALE DI RIPRESA E RESILIENZA
FRANCE 2030
MUR Ministero dell'Università e della Ricerca
obn
bpifrance
ASE BIO
BIO DEUTSCHLAND

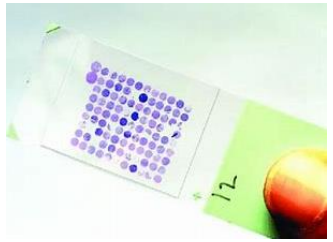
We Care

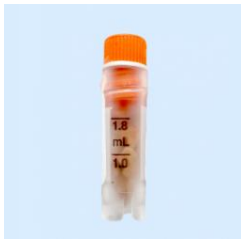
- Ethical, compliant and transparent sourcing (from OEMs only)
- Animal welfare policy
- Corporate Social Responsibility (ISO 14001 / ISO 9001, Decarbonation Program)

Effortless access to a large panel of biological samples

Human & Animal samples

Cellular models	Tissues & Organs	Blood Products	Biofluids & Others
▪ Primary Cells	▪ Fresh Tissues	▪ Serum, Plasma	▪ Cerebrospinal Fluids
▪ Fresh Islets	▪ FF or FFPE Tissues	▪ Red Blood Cells, PBMCs	▪ Buccal / Nasal swabs
▪ iPSCs, Cell Line	▪ Tissue Micro Array (TMA)	▪ Liquid Biopsies	▪ Urine, Faeces
▪ Dissociated Tissue Cells	▪ Biopsies, Skin	▪ Fresh whole blood	▪ Hair





Two options : Biobank or prospective collection

Our Biological Samples are associated with clinical data and/or Certificat of Analysis

Proprietary & Confidential

Effortless access to a large panel of biological samples

Focus on cellular models

Cellular models	Tissues & Organs	Blood Products	Biofluids & Others
▪ Primary Cells	▪ Fresh Tissues	▪ Serum, Plasma	▪ Cerebrospinal Fluids
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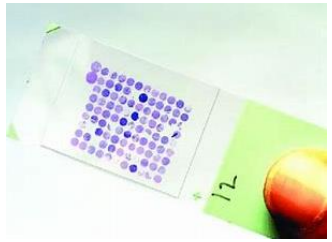

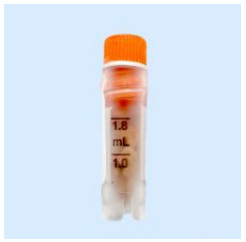

Two options : Biobank or prospective collection

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1. *In vitro* model : main challenges
2. Sourcing of the relevent model
3. Control the microenvironment
4. Fascilitate the access
5. Go home message

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1.

In vitro models : main challenges

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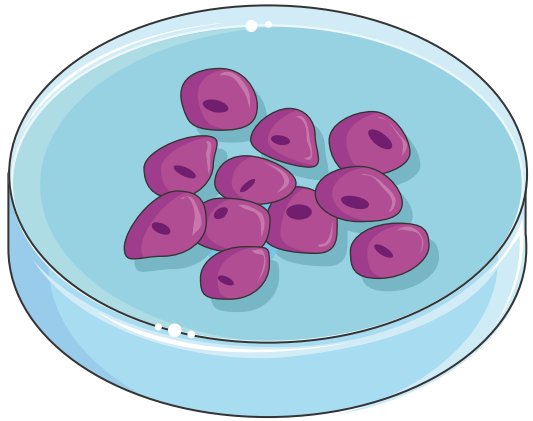
In vitro models

General

A representative model within a controlled environment



From primary cells to Artificial tissues

Broad area to cover

- Disease modeling : Onclogy, metabolism, neurosciences, etc.
- ADME-Tox : Drug screaning and toxicology studies
- Regenerative medicine : Artificial tissues from stem cells
- Bioproduction : Large scale antibody production
- Control : Chemical impact, regulatory testing

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In vitro models

Expectation

Control	Ethic	Cost	Reproductibility
▪ Control the experimental environment, including medium, growth factor, temperature, pH, O2/CO2 concentration, and nutrient supply.	▪ Reduce the need of animal testing ▪ Being compliance with european directive on human cells derived models	▪ Less expensive and faster to use than in vivo models	▪ Easily replicated under standardized conditions.

Stable – Efficient – Easy to use – Compliant

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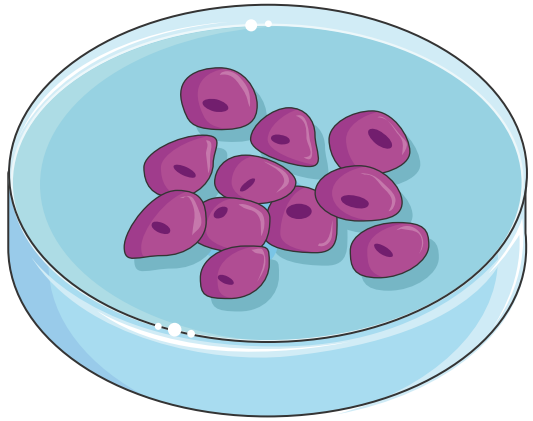
In vitro models

One real objective …



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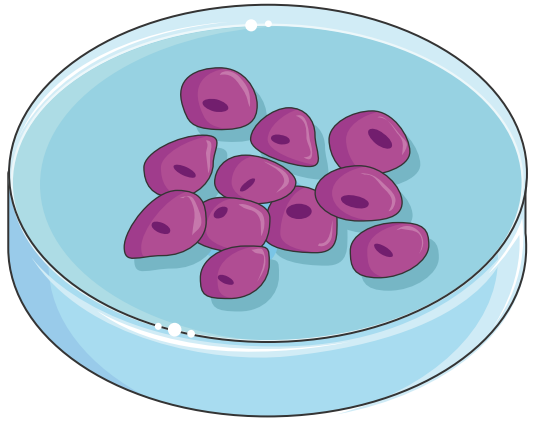
In vitro models

… bringing multiple challenges



- Sourcing of the most relevant cellular solutions
- Reproducing physiologically relevant environment
- Easily and ethically access to the cellular model

No magical model on the market so far.

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2.

Sourcing of the relevent model

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Solid tumor model

Cryopreserved vial with multiple cell types representing a full organism

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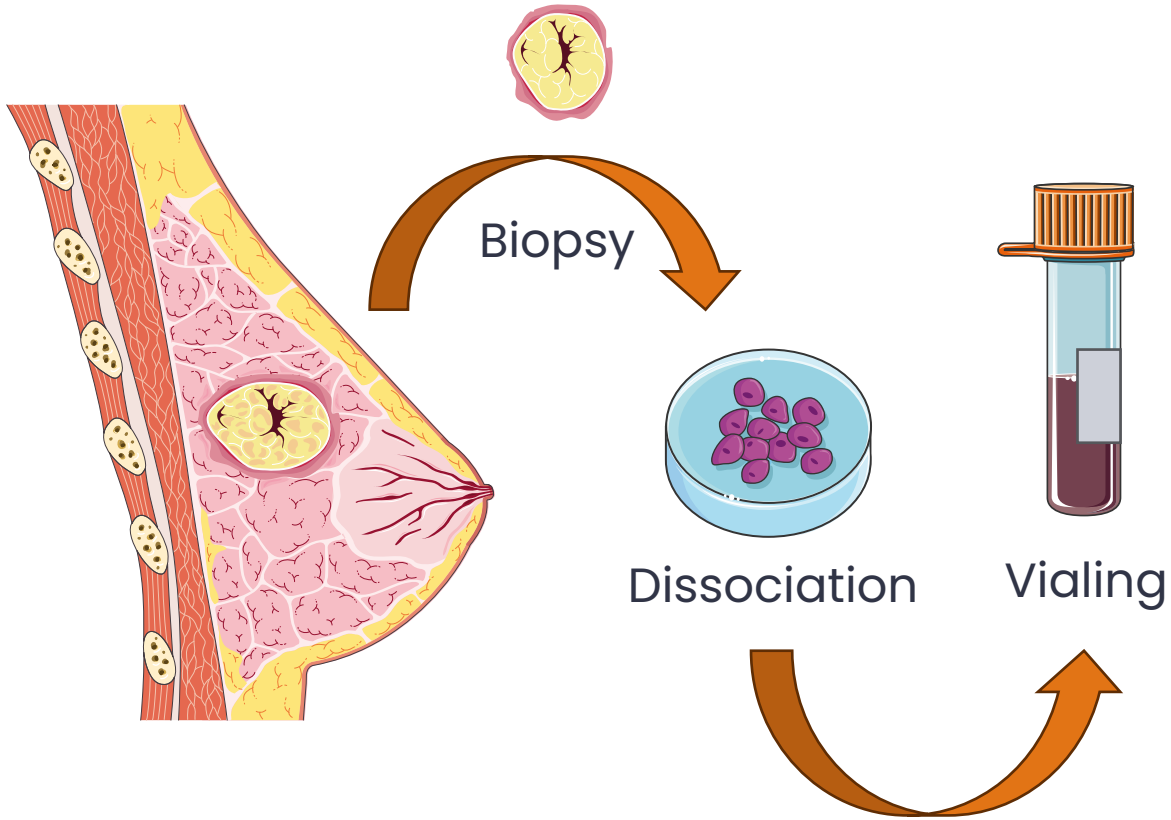
An ideal *in vitro* model for solid tumor studies

Dissociated Tissue Cells

- Dissociated Tissues Cells are **single cell suspension** that are dissociated from a solid tumor using both **enzymatic & mechanical** digestion, and are characterized by a heterogenous cell composition
- DTC are the best alternative to fresh tissue, **eliminating logistic challenge**, cost and delays of fresh collection.
- **Mimics the tumor microenvironement** thanks to the presence of stromale and immune cells
- Ideal for **organoïds formation**, physiolocal relevant models
- **Associated with Dataset**, HLA typing and cell population analysis
- Post thawing **high viability**



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An ideal *in vitro* model for solid tumor studies

Dissociated Tissue Cells

Each patient's tumor is unique with variance in therapeutic responses, which made a DTC the best model for **precision medicine** study.

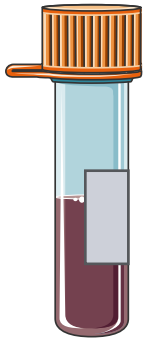
- Associated Data
  - Primary Diagnosis
  - Tumor location
  - Clinical stage
  - Treatment status
  - Age, Gender, Race & Ethnicity

- Flow cytometry data

- Matched set available : DTC + PBMC / FFPE / Etc.

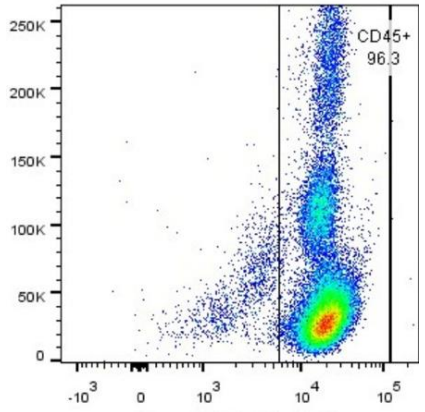
Biobank DTC

Tailored DTC



Breast
Gastric
Lung
Bladder
Head & Neck
Cervical
Ovarian
Pancreatic
Colorectal
Endometrial
Renal Cell Carinomas

From 0,5 to 8M viable cells per vials



Leukocytes

Formulation, % of
CD45+
CD3+
CD4+
CD8+
CD19+
CD3-
CD11
CD15+
Etc.

HLA-A02 status
EpCam+

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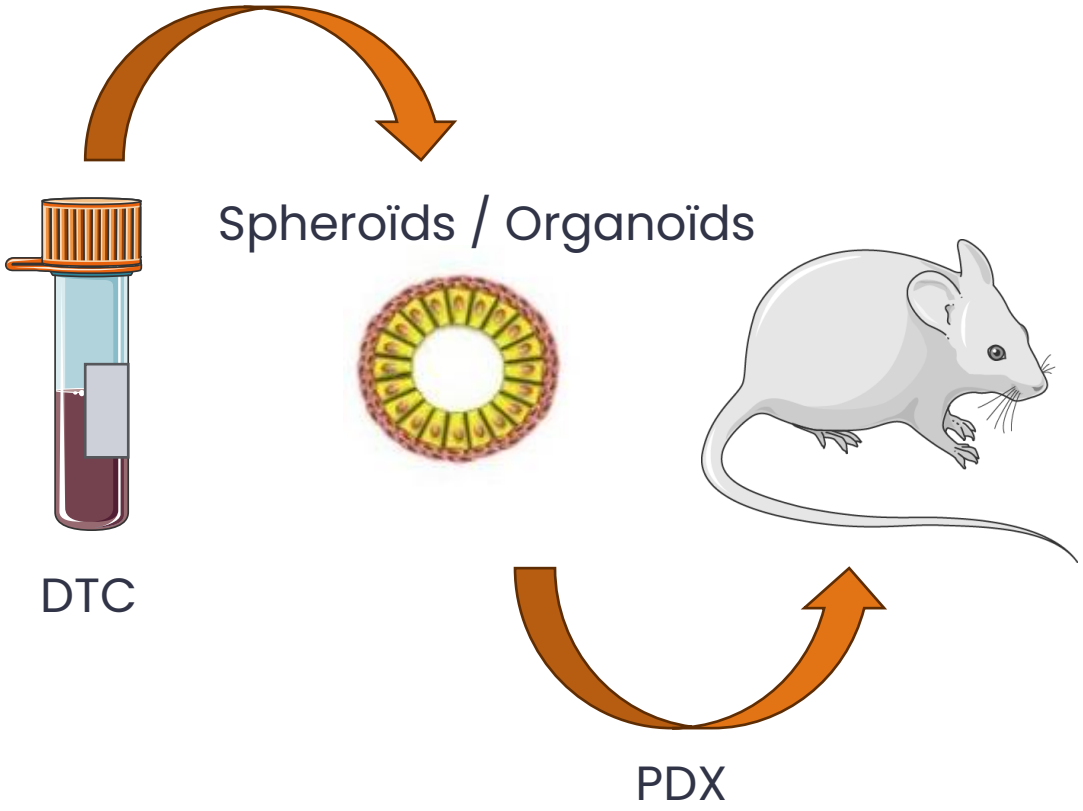
Application examples

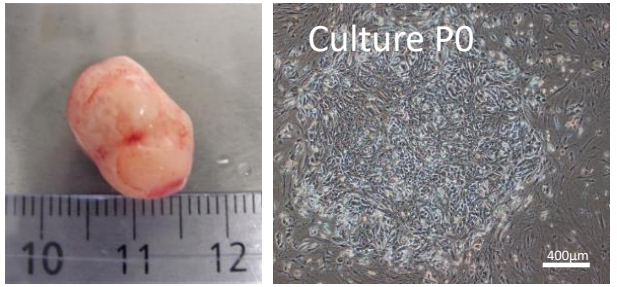
Dissociated Tissue Cells

Preclinical *in vivo* studies



Preclinical *in vitro* studies

From your patient biopsy or PDX



Development of epithelial cell colonies in specific culture medium that can be sub-cultured

Organoïds biobank for drug screening

- Send your biopsy and your drugs
- We generate your DTC & organoïds
- We test your condition on a full DTC set representative of a real human population

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Replicate heatlhy or diseased conditions

iPSC and derived cells

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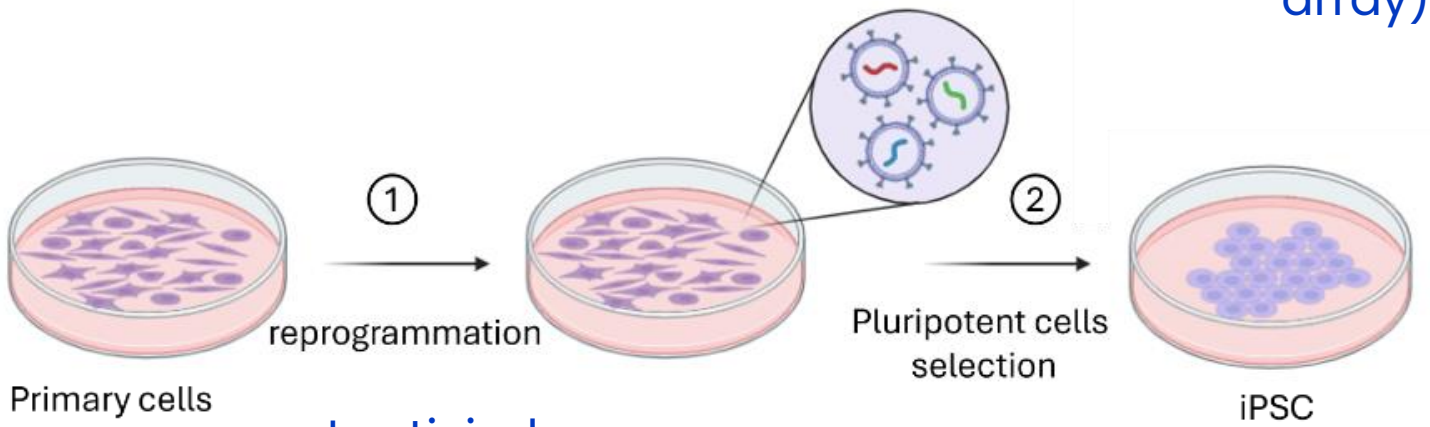
A full process covered by Tebubio

iPSC & Derived cells

Caracterisation kits (NANOG ELISA, Pluripotency regulation array)

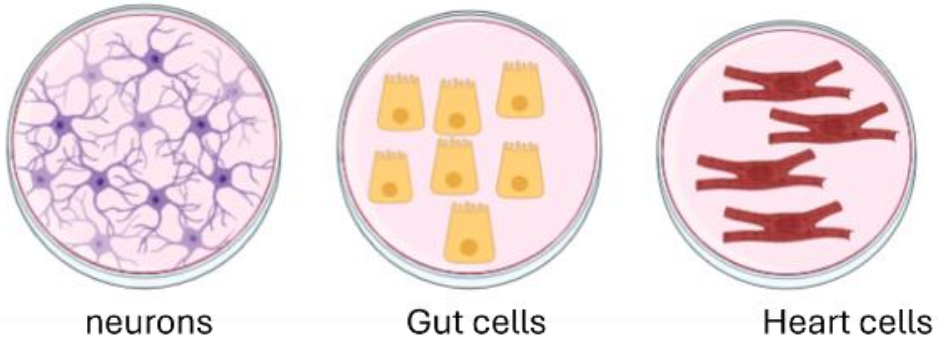
A large human and animal biobank of primary cells (healthy & diseased)



Cas9 expression iPSC / Cas9 inducitble or Luciferase iPSC

Lentiviral vectors
Plasmid
mRNA
...

3 differenciation



+ media
+ ECM
+ Growth Factor

Avaliable as catalogue ref (healthy & diseased)

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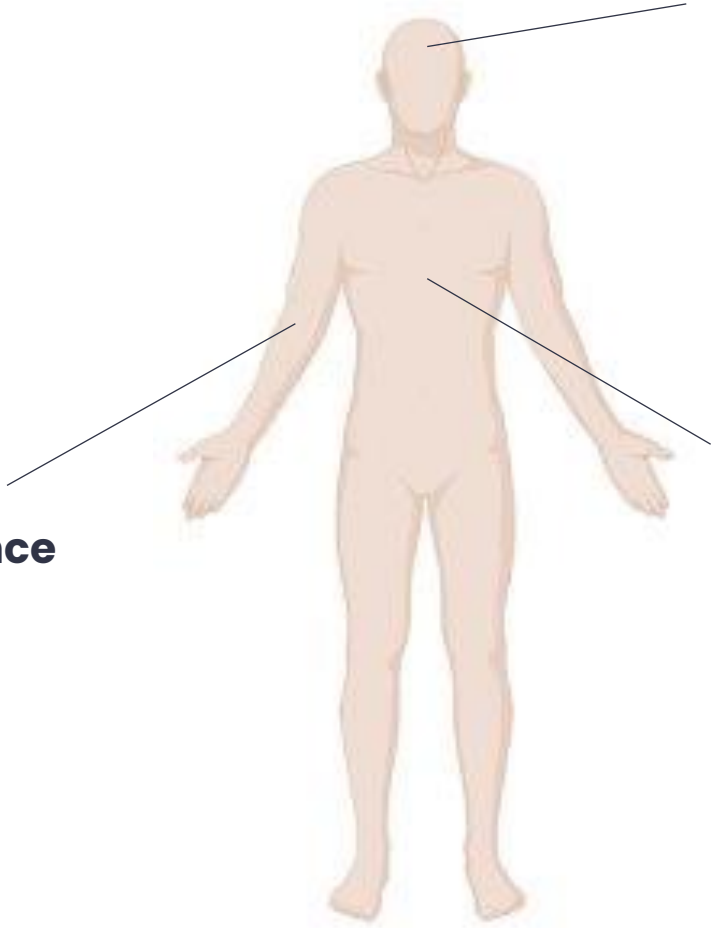
Fondamental & preclinical research tools

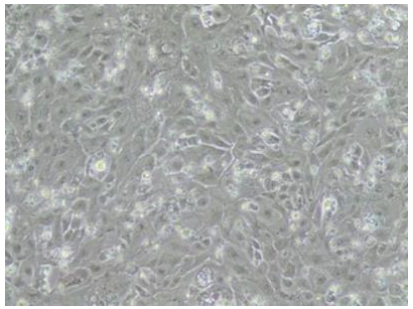
iPSC & Derived cells

Stem cells
Neural stem cells
Stem cells derived from skin fibroblast with identified phenotype

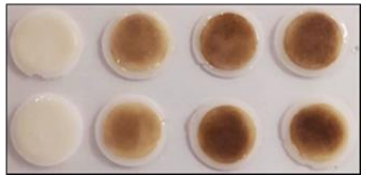


Neurosciences
Neural stem cells, Dopaminergic neurons, motor neurons, astrocytes
Healthy, Alzheimer, Parkison, Genetic mutation

Cardiology
Skeletal muscle myoblasts
Fibroblast
Cardiomyocytes



Cosmetology and skin science
Melanocytes with different phenotypes, Retinal pigment epithelium, sebocytes



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In vitro model for bioproduction and C&G therapy

iPSC and derived cells

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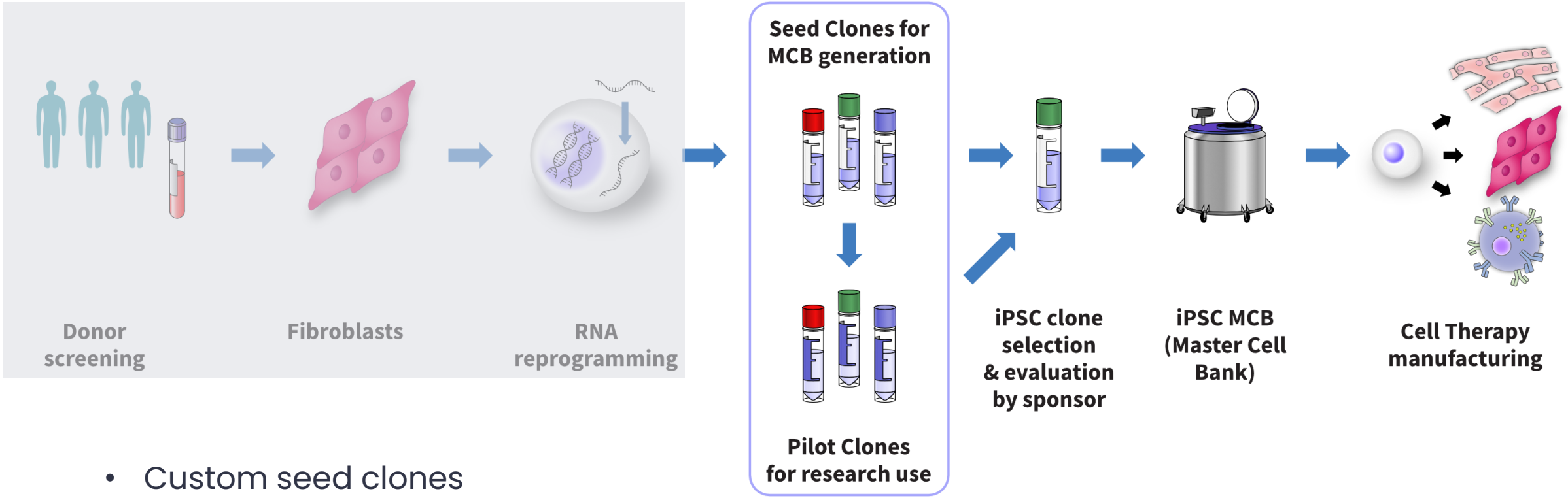
GMP compatible solution for Cell Therapy & Bioproduction

iPSC & Derived cells



- Custom seed clones
- Ready-to-use seed clone bank
- Pilot clone

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ADME-T *in vitro* study

Primary cells & Spheroïds

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ADME-T

Primary cells models

Up to 4 weeks experiment !
Ideal for low clearance studies

Robust model but huge disparities with in vivo findings

Ability to reproduce the liver physiology

Human Liver Microsomes

Suspension
Human Hepatocytes

Spheroid
Human Hepatocytes

Plateable
Human Hepatocytes

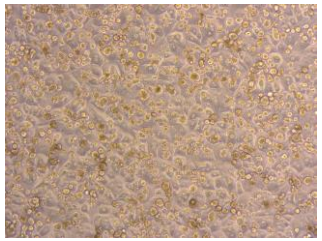
HHSEC Cells, Stellate Cells, Kupffer cells.

Complex **Co-Culture**
2D or 3D Models

Liver-on-chip

Throughput of the experiment

Short term metabolic stability analysis (Phase I oxidative metabolism / Phase II conjugation enzymes)



One week study, ideal for metabolite identification, CYP induction or inhibition evaluation, transport studies, etc.

Cryostax®
1 pellet = 1 donor

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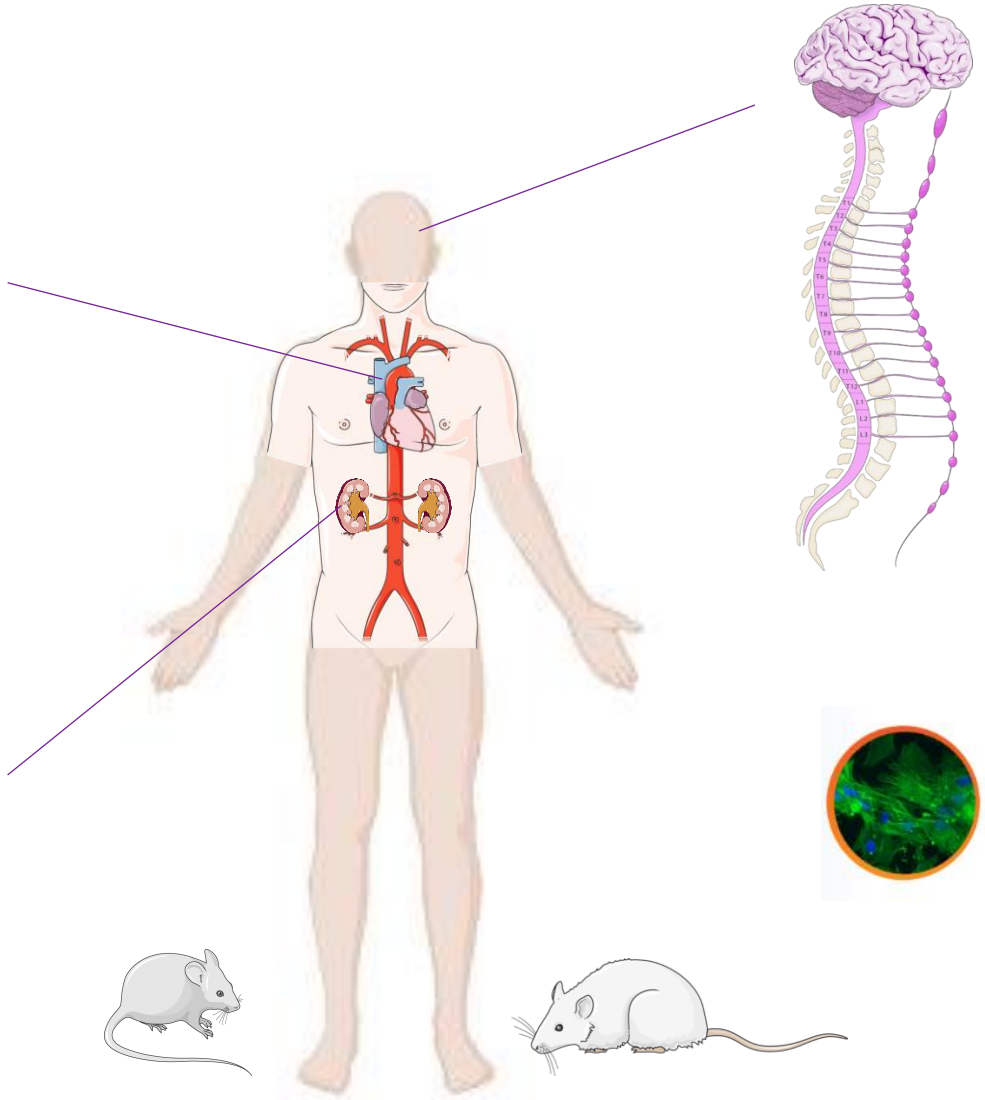
Primary cells

Other application

- Primary **vascular cells**

Umbilical vein endothelial cells, aortic endothelial cells, brain vascular pericytes, intestinal microvascular endothelial cells, cardiac fibroblasts, etc.

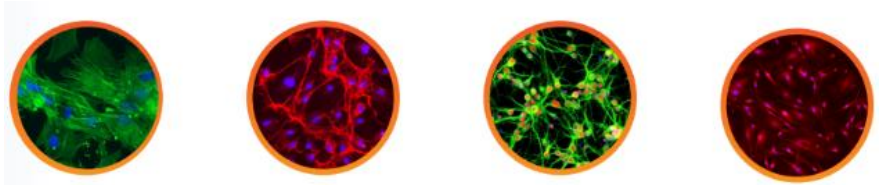


- Human and Animal neuronal cells for **CNS research**

Primary brain vascular pericytes, astrocytes, microvascular endothelial cells, meningeal cells, swhann cells ...

- **Renal cells models** offer accurate and reliable insights, enabling researchers to study **kidney function, disease mechanisms and potential therapeutic interventions**

Glomerular Microvascular Endothelial Cells, Renal Cortical Epithelial cells, Proximal tubular epithelial cells, podocytes, etc. **-> Can be matched !**



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Control the microenvironment

Customized models and project

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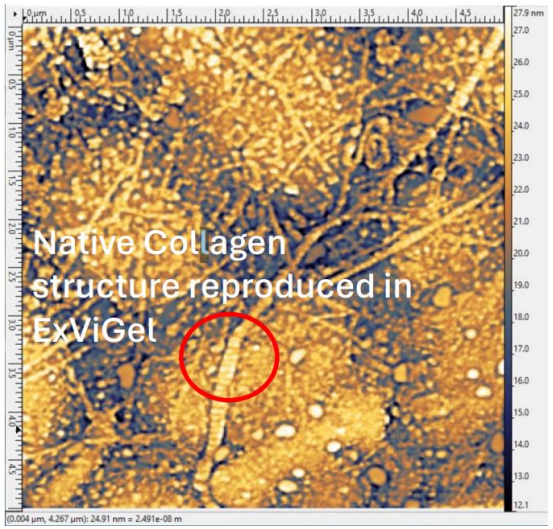
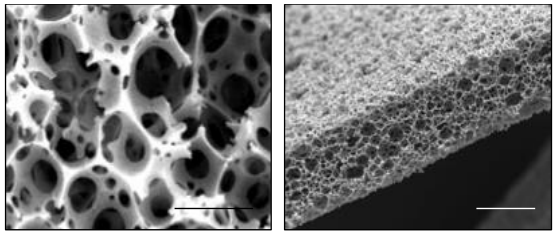
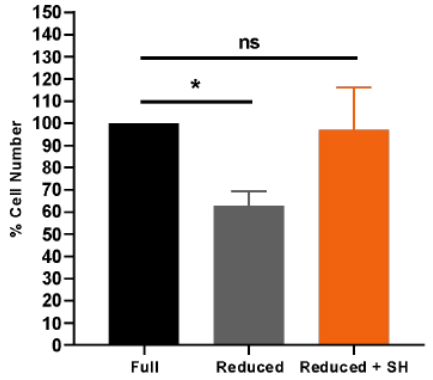
A large panel of ECM and 3D device

We guide you through our portfolio to facilitate your project

- The challenge of the ExtraCellular Matrix : Matrigel altenatives
  - **VitroGel®** : an optimized ECM for organoïds production and iPSC differenciation
  - **ExVigel®** : a human derived ECM with complete collagene fibers supporting on oncology and ADME models
  - **CityMix®** : Xeno-Free supplement - decrease your growth factor and animal serum needs
  - **Alvetex®** : a 3D matrix that respect the physiological 3D structure of your tissue : skin, intestinal tissue, etc.







Porcine satellite cells grown for 3 days with Beefy media containing the recommended supplementation (Full: black or a quarter of the recommended supplementation (Reduced: grey), as well as with Reduced plus Shanghai-mix (orange). Cell number was assessed using alamarBlue ™ cell viability assay and expressed and expressed as the mean ± S.D of 3 independent repeats, with significance assessed using one-way ANOVA with Dunnett's multiple comparisons post-hoc tests.

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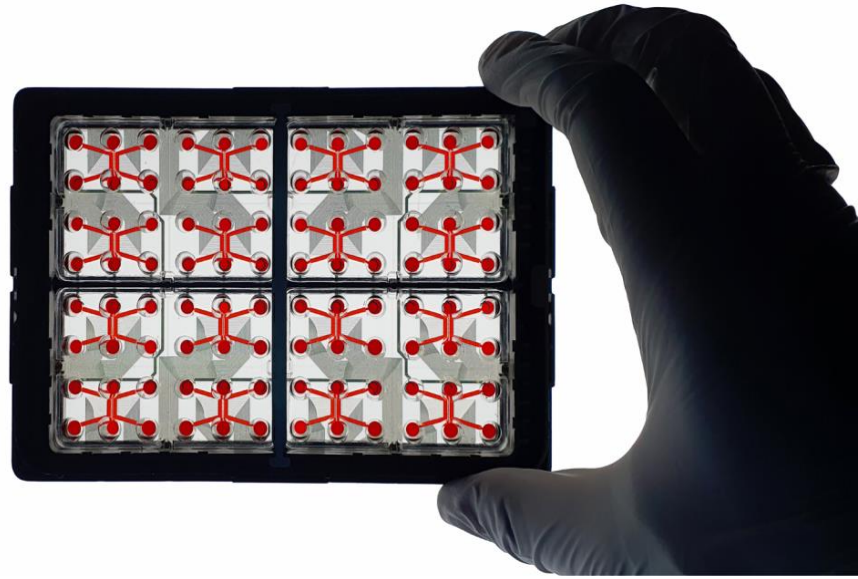
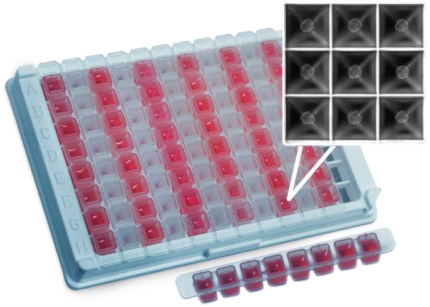
A large panel of ECM and 3D devices

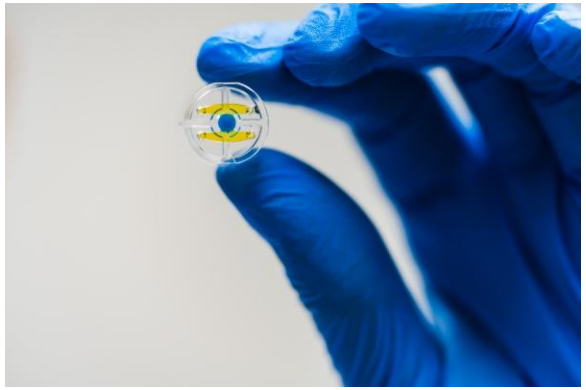
We guide you through our portfolio to fascilitate your project



- Devices that increase the relevance of your model
  - **NeuroFluidics devices** : DuaLink / TriaLink : ideal for pain, intestinal or skin study in relationship with CNS. Axonal growth



  - 3D/ Spheroïds qualified culture plate
  - **idenTx / organiX** : organ on chip solution : ideal for organoïds culture or tissue différenciation in a 3D conformation



  - **Microfluidic chips :** validate your models with systemic circulation

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A full team to guide you

To find the best solution

Romain Cordonnier G, Ph.D
Chief Scientific Officer

Ali El Baya, Ph.D
Product Manager

Elise Abboud, Ph.D
Product Manager

Ines Santarino, Ph.D
Product Manager

Dimitri Szymczak, Ph.D
Product Manager

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Contract Research Services : We do it for you!

The expert you need to accelerate your research

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Tebubio’s CRS

Our CRS laboratory is here to supplement your expertise

- ***In Vitro* Models Platform**

- Scientist to Scientist : one project manager dedicated to you
- From primary cell culture till 3D models
- Compatible with your tissue : generation of *in vitro* models from your patient biopsy
- Customized project with your experimental conditions

- Skin models, Organoïds, DTC, BBB, Fresh Islet, etc…

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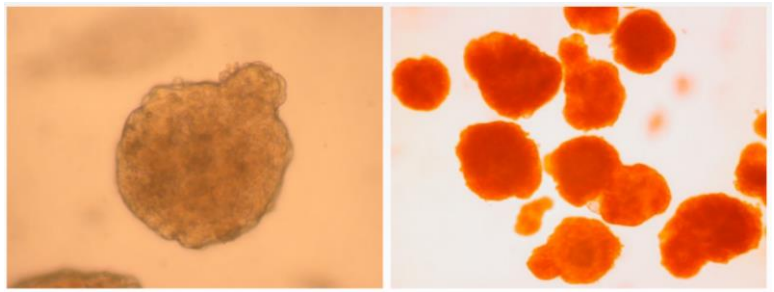
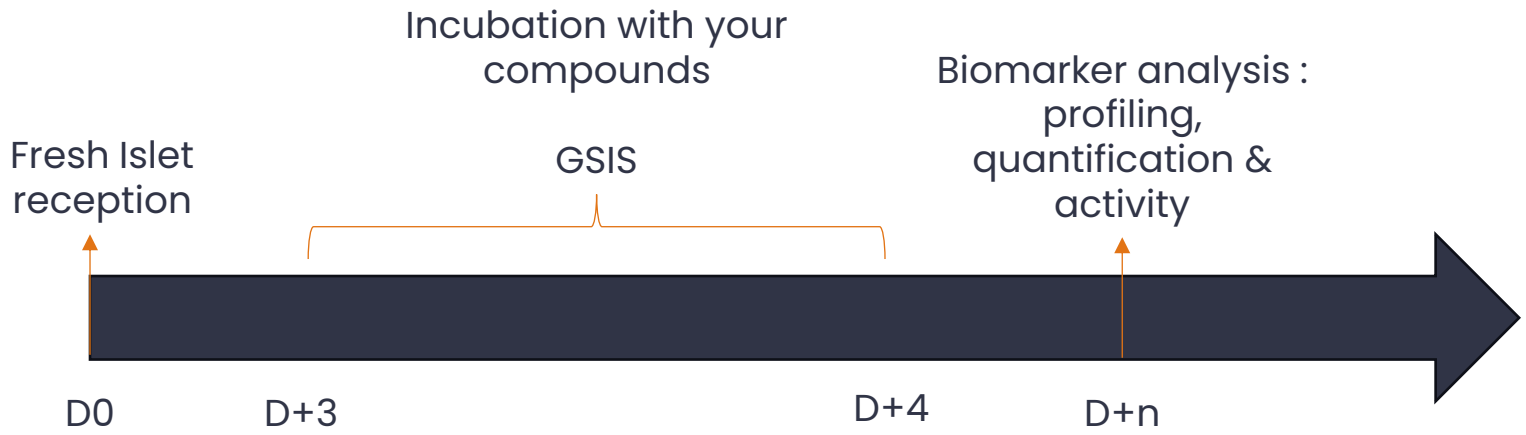
Tebubio's CRS

Metabolism study : example

- **Insulin Release Assay (GSIS) : human islets including insulin ELISA**





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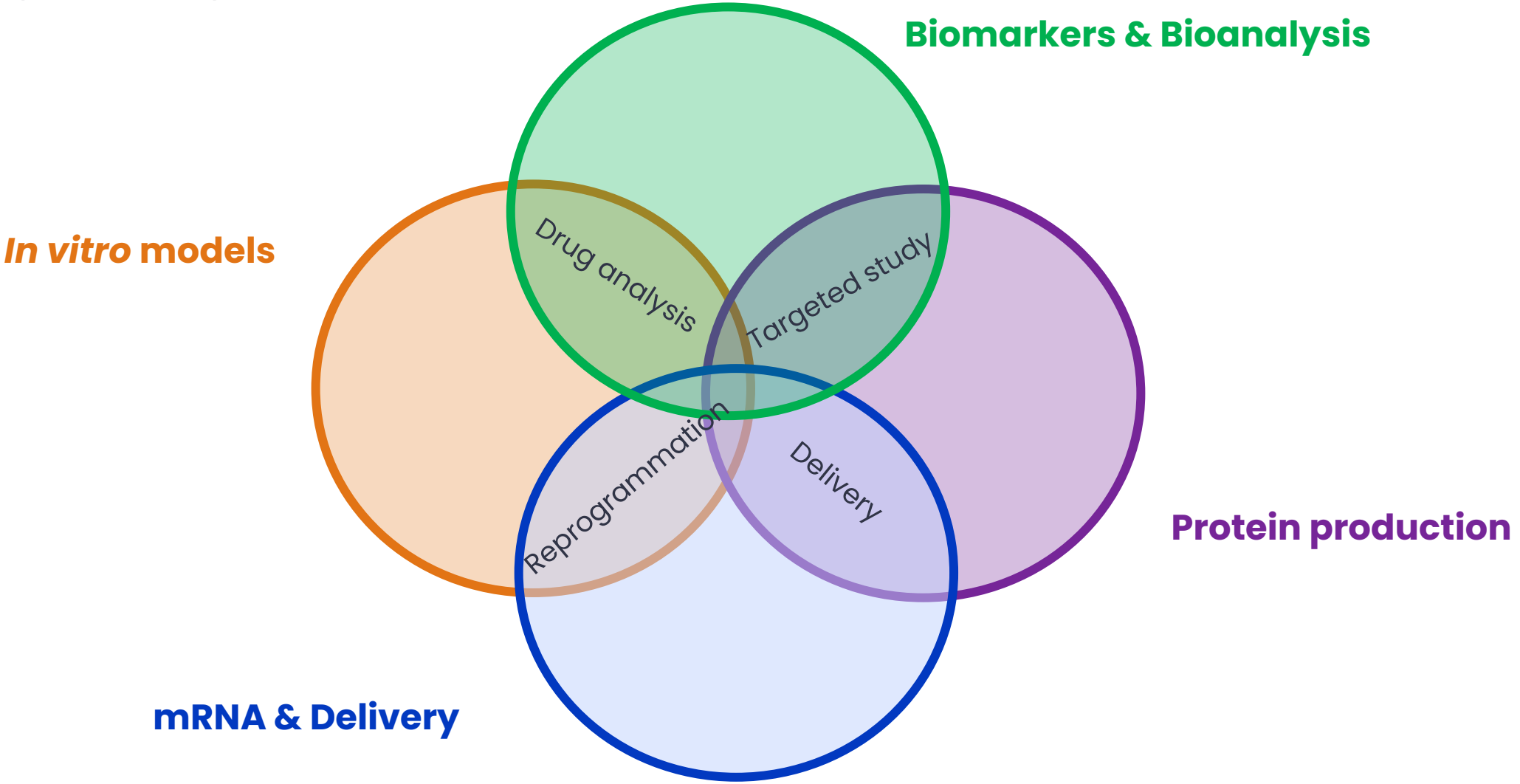
Tebubio’s CRS

4 complementary platforms



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3.

Our Commitments

In vitro models are biological samples

Ethics

- More awareness on *in vivo* study and **animal welfare**

- Evaluation of every animal samples suppliers, to be compliance with Tebubio's animal welfare policy
- Every 3 years
- CITES management

Supply & Logistics

- Challenging and irregular supplies due to **geopolitics conflicts, difficulty to deal with many parties**

- Only one global supplier with a tailored purchase system
- CRS activity covering your full project

Reglementation

- French reglementation very **strict** on biological samples import and use

Up to 3 months !

- Global approved import / export permit (IE, AC & DC)
- Samples come from :
  - Donor not paid
  - Consent
  - IRB approval

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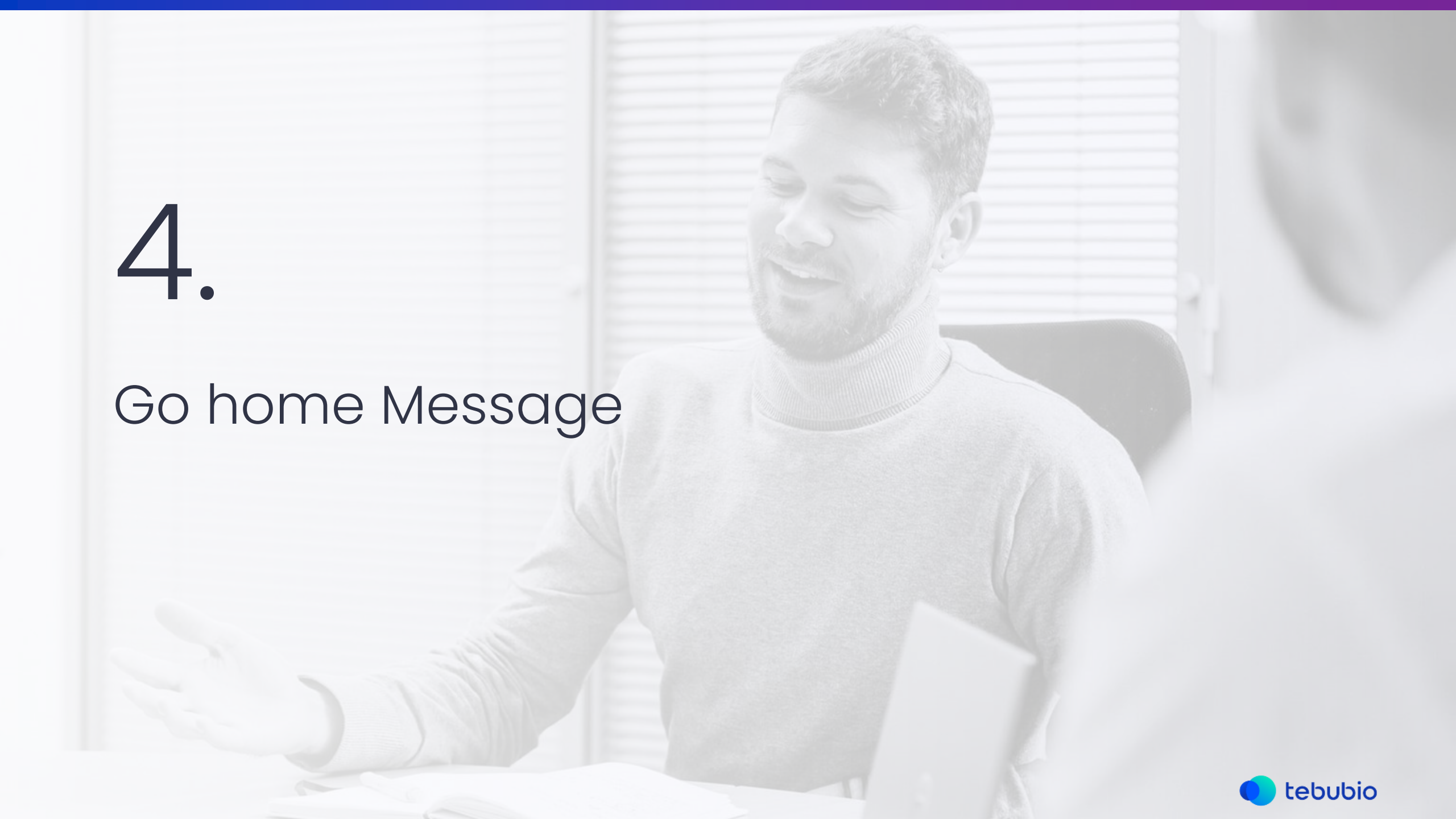
4.

Go home Message

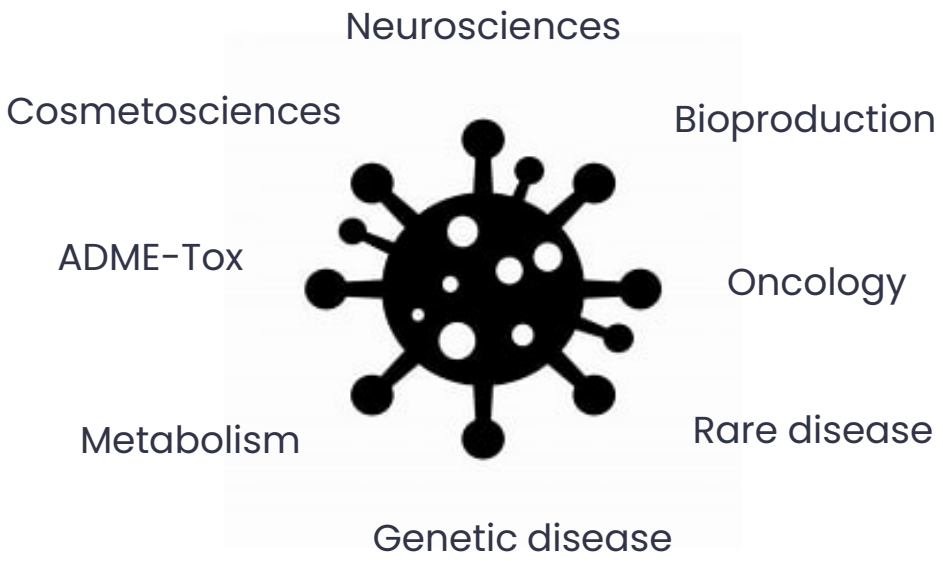


One global coverage

- Sourcing of the most relevant cellular solutions
  - Solutions : broad offer of cells derived from patient

- Reproducing physiologically relevant environment
  - Solutions : Tailored ECM solutions and 3D devices

- Easily and ethically access to the cellular model
  - Solutions : our ethical and legal commitment associated with our purchase and logistic expertises



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With Tebubio, Concentrate your efforts on Your Research

Broad range of Biological samples

A large portfolio

Access to **Human and Animal cellular models**

Samples characterized (clinical data, donor criteria..)

Trusted and ethical suppliers

Get solutions from **reputable global suppliers**, carefully selected for their **relevance**, **ethical** and **legal** compliance (Animal Welfare).

Dedicated scientific support

Our **scientific team** helps you source, select and use solutions.

Outsource and accelerate research

Strong expertise in Life Sciences

- Source, realise, analyse.
- **2D & 3D** cellular culturing
- **Cellular** studies
- **Biomarkers** & Biostatistics analysis

Team committed to success

Get a **PhD project manager** to ensure the success of your project.

Based in Europe

All our **teams** and research **centers** are in Europe.

Streamline your ordering process

Less partners to manage

Order from a **single source.**

Reliable supply chain Mgt

- **IATA** (Internat. Air Transport Assoc.)
- **HBS/ABS authorization** from Frecnh government
- **Sourcing outside** usual suppliers
- **Warehousing** services
- **Lot Reservation - Scheduled Delivery** based on your needs

Tailored agreements

From specific **one-off terms** to **procure-to-pay**, supported by **e-procurement** solutions.

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Our reliable Partners

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Facilitators of Life Sciences Research