DIVA
EXPERTISE

Your Research Partner on Human Adipose Tissue

DIVA Expertise

First in human adipose tissue modelization

- Leader in applied research on human adipose tissue

  More than 15 year-knowledge of physiology and physiopathology

- High-biotech plateform

  Specialized in biological modelization and characterization of human adipose tissue

An unique and personalized support of the research, from the Cell to Humans

- Innovative french biotech

  Based in Toulouse, in the Biotechnologies Center of Pierre Potier

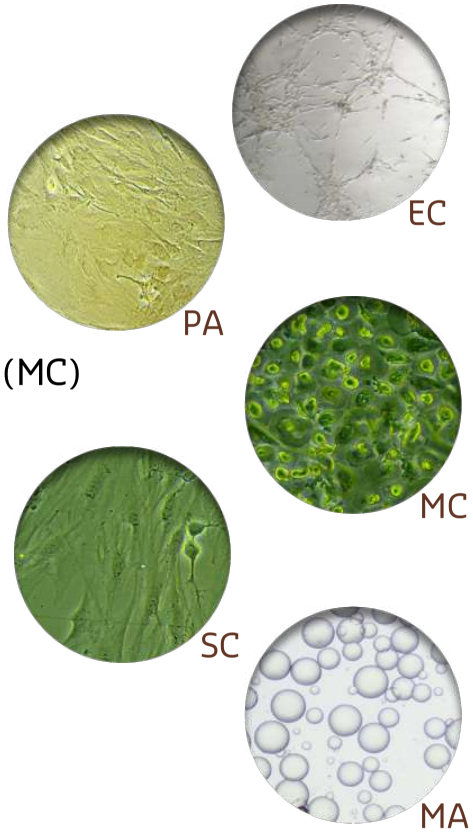
- Network of multidisciplinary partners

  Medical, academic, preclinical and clinical partners

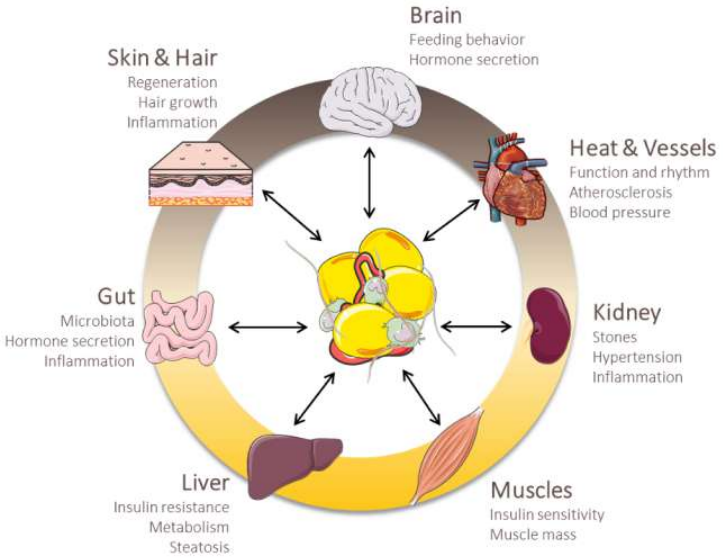
Human adipose tissue

The most represented tissue in human body with different localizations : visceral, sub-cutaneous

- A high cellular heterogeneity :
  - Mature adipocytes (MA)
  - Preadipocytes (PA)
  - Endothelial cells (EC)
  - Immune cells like macrophages (MC)
  - Stem cells (SC)



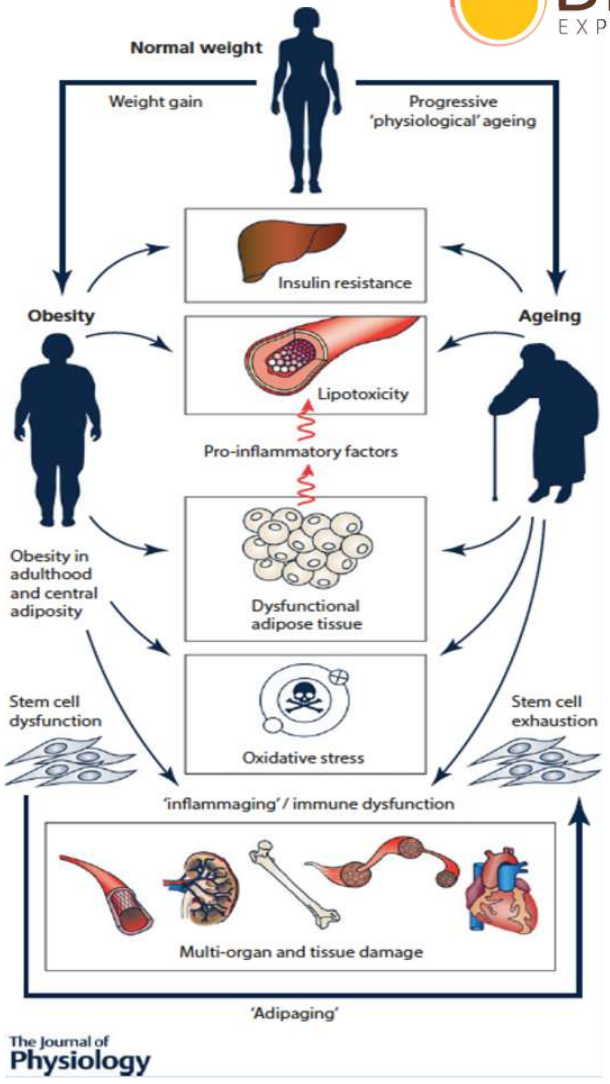
- A multi-functional organ :
  - Energy storage
  - Mechanical protection
  - Endocrine function
  - Thermogenesis



Adipose tissue, target of obesity and ageing

Aging and Obesity share several common causative mechanisms related to a dysfunctional adipose tissue/adipaging :

- Metabolic disorders,
- Multi-organ and tissue damage,
- Oxidative stress,
- Immune dysfunction and
- Systemic and low-grade chronic inflammation/inflammaging.



From LM Perez *et al,* the journal of Physiology (2016)

DIVA Services

DIVA EXPERTISE

DIVA PLATFORM

BIOBANK

Preparation and supply of biological materials derived from human adipose and skin tissues

TESTING & STUDIES

Evaluation of product efficacy on adipose and skin models

R&D

Customized R&D for co-development of new models or new tests

ANALYSES

Characterization of adipose tissue samples collected from *in vivo* studies

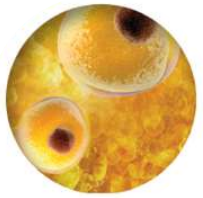
CONSULTANCY

Coordination from preclinical to clinical studies

Scientific valorization

DIVA BIOBANK

A BIO-BANK OF BIOLOGICAL MATERIALS DERIVED FROM ADIPOSE AND SKIN TISSUES



A LARGE AND PRE-QUALIFIED BIO-BANK OF BIOLOGICAL RESOURCES

Cell Vials

- Preadipocytes
- Dermal Fibroblasts
- Keratinocytes
- Endothelial Cells
- Stem cells

RNA

- Adipose tissue
- Preadipocytes
- Mature adipocytes

Tissues

- Fixed adipose and skin tissues
- Frozen adipose tissues

DONOR CHARACTERISTICS

- Gender
- Age
- **Body Mass Index :** lean, overweight, obese
- **Body Localization :** Abdomen, Arm Face, Thigh
- **Phototype :** I, II, III, IV

Human biobank from more than 200 different donors

Conditioned Media

- Conditioned adipose tissue media
- Conditioned macrophage media

Ready-to-test models

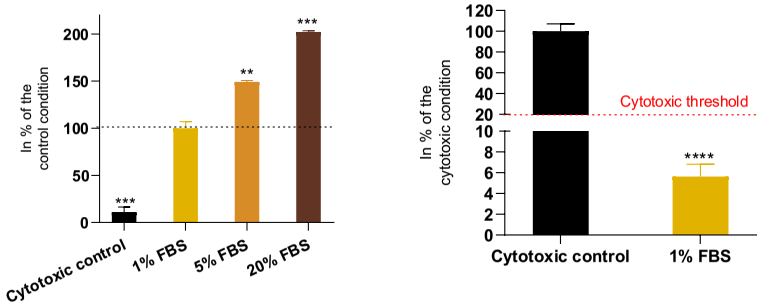
- 96-well preadipocytes (non-differentiated, differentiated in classical or pro-inflammatory environments,...)
- 96-well dermal fibroblasts
- 6-well DIVA Skin (3-layer human skin)

Protein extracts

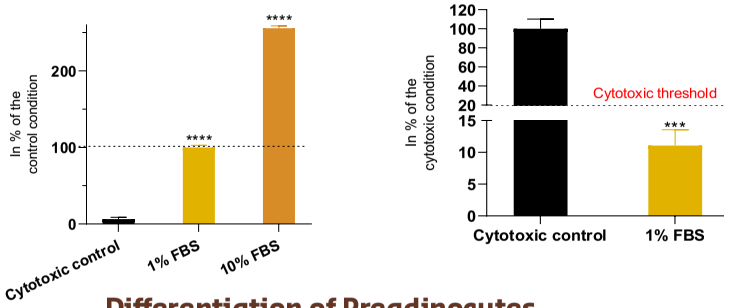
- Adipose tissue
- Preadipocytes
- Mature adipocytes

A PRE-CHARACTERIZED BIO-BANK OF HUMAN SKIN CELLS

Viability and cytotoxicity of dermal fibroblasts

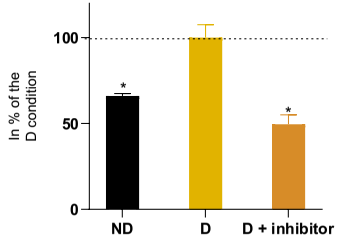


Viability and cytotoxicity of Preadipocytes



Differentiation of Preadipocytes

FBS : Fetal Bovine Serum
ND : Non Differentiated
D : Differentiated



Unpaired t-test compared to the respective control condition : * p<0.05 / ** p < 0.01 / *** p <0.005 / **** p < 0.0001

DIVA Platform

DIVA Platform

Selection of donor criteria

1

SELECTION

- Man / woman
- Young / Aged
- Lean / Obese
- Abdomen, face, thigh
- Phototype I, II, III, IV

Screening or mechanistic studies

2

MODELIZATION

- 2D/3D-cultures of human cells
- Co-culture of different cell types
- Culture of human skin/adipose explant
- Reproduction of microenvironment/stress

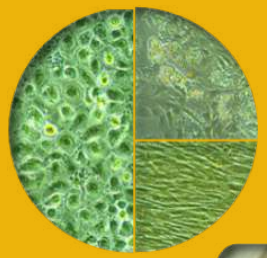
Complete biological characterization

3

CHARACTERIZATION

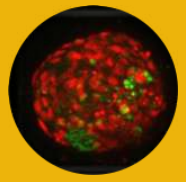
- Biochemical analyses
- Western Blot
- Real Time PCR
- Immunofluorescent/bright field microscopy
- (immuno)histochemistry
- Oxygen consumption

DIVA Models



2D Cell cultures
- Preadipocytes
- Macrophages
- Fibroblasts

3D Cell cultures/Co-cultures
- DIVA Spheres™: Preadipocyte spheroids
- DIVA Caps™ : Mature adipocyte capsules
- DIVA Skin Caps : co-culture of adipocytes and fibroblasts



Tissue cultures
- Complete explant of adipose tissue
- DIVA Skin™ : 3-layer explant of skin
- DIVA Gut : biphasic culture of intestinal and adipose cells

DIVA Tests

DIVA EXPERTISE

Adipocyte development
- Proliferation
- Differentiation
- Beigeing
- Vascularization

Adipocyte alterations
- Inflammation
- Fibrosis/Matricial remodeling
- Oxidative stress
- Senescence

Adipocyte metabolism
- Lipogenesis
- Lipolysis
- Bioenergetics
- Secretome

Adipocyte interactions
- Fibroblasts
- Endothelial cells
- Muscle cells
- Intestinal cells

DIVA Benefits

DIVA EXPERTISE

ETHICAL AND BIOMIMETIC SCIENCE

- Human models as alternative to animal experimentation
- High biological relevance

OPTIMIZED AND RELIABLE STUDIES

- Miniaturization in 96-well format
- Multiparametric approach
- Positive & negative controls
- Conditions in triplicates

PERSONALIZED AND COMPLETE R&D SUPPORT

- From biobanking to testing
- From pre-validated models to customized models
- From cell studies to clinical trials

DIVA REFERENCES

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