

ADIPE

ADIPE system mimics the natural human WAT (White Adipose Tissue) in terms of cells organization, cellular metabolism and lipids accumulation during adipose tissue differentiation.

Advantages compared to 2D systems: enhanced cell viability, high biological relevance, stable morphology, polarization, increase in proliferative activity and physiological metabolic function.

Applications

- Metabolic disease and obesity
- Fibrosis and pro-inflammatory conditions (customized co-culture)
- Miniaturized and personalized model for metabolic profiling
- Lipid metabolism: lipolysis and adipogenesis
- Drug toxicity and accumulation
- Control of sex steroids and glucocorticoids metabolism
- Metabolic studies
- Applicable to pre, pro, postbiotics (customized models)

Cell source:

primary human pre-adipocytes, subcutaneous, or MSCs-IPs derived progenitors

Differentiation:

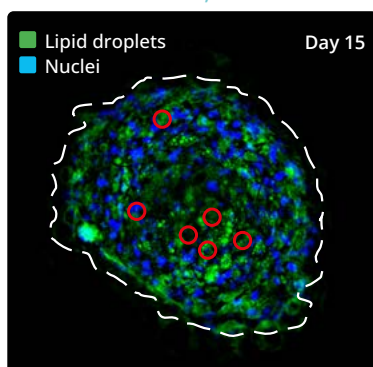
15 days

Relevance:

lipids droplets increased their sizes during differentiation according to genomic evolution; differential sensitivity to inflammation according to donor type (BMI, gender, age)

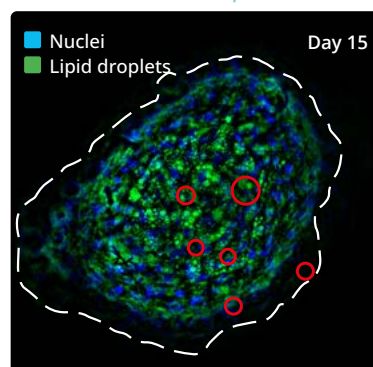
ADIPE: a case study

A - MALE DONOR, BMI 29



Total Z Size: 194.4 µm
Z plane: 54/81 (129.6 µm/ 194.4 µm)

B - FEMALE DONOR, BMI 29



Total Z Size: 199.2 µm
Z plane: 65/83 (156 µm/ 199.2 µm)

- Exposure to higher inflammatory inducer, spheroids from **DONOR B** pre-adipocytes exhibited several mature lipids droplets widely organized inside the tissue;
- Jagged boundaries are due to the progressive lipid accumulation in whole adipose tissue suggesting a complete adipogenic differentiation;
- On the contrary, spheroids from **DONOR A** pre-adipocytes showed low amount of lipid droplets not fully defined, at the same time of maturation.

Posters

Francesca Rescigno and Marisa Meloni
Scaffold-Free Human Adipe Spheroids Model: Phenotype Dependent Inflammatory Response
Poster MPS 2022, New Orleans, USA

Rescigno Francesca, Carriero Francesco, Meloni Marisa
New insights on the role of adipose tissue by using 3D scaffold free organoids
Poster IFSCC 2019, Milan Italy

Barbara de Servi, Elisa Caviola and Marisa Meloni
Adipocytes 3D scaffold free microtissues for preclinical applications
Poster SID 2017, Portland, Oregon (USA)