

IN VIVO-LIKE MORPHOLOGY OF ADIPOCYTES

INTRODUCTION

Adipocyte have a characteristic round morphology in vivo, due to the production of one large lipid vesicles, created by lipogenesis (1). In conventional cell culture, adipocytes cannot acquire this physiological morphology.

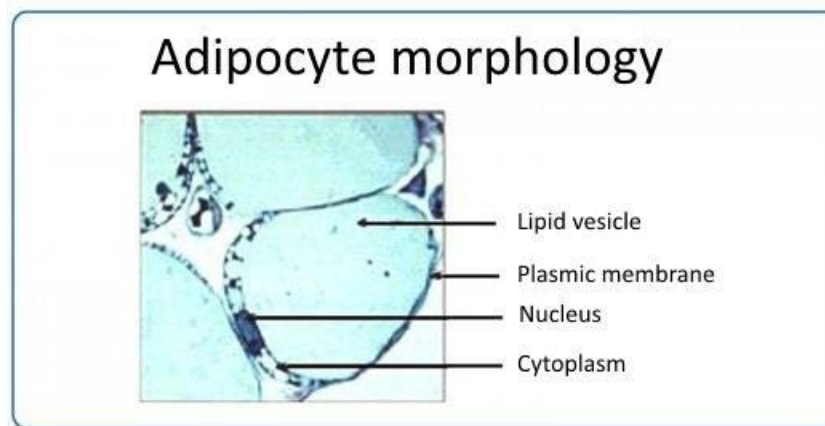


Figure 1: In vivo adipocyte morphology (Source: <http://biologiedelapeau.fr/spip.php?article28>)

MATERIALS & METHODS

- Preadipocytes 3T3-L1 are derived from mouse embryos and are a widely used model for adipocyte study.
- HWP are subcutaneous cryopreserved cells, isolated from different healthy adult.
- Brightfield microscopy

Matrix properties

Transparent and porous

RESULTS

The morphology of adipocytes grown over time in BIOMIMESYS® *Adipose tissue* and traditional culture has been studied

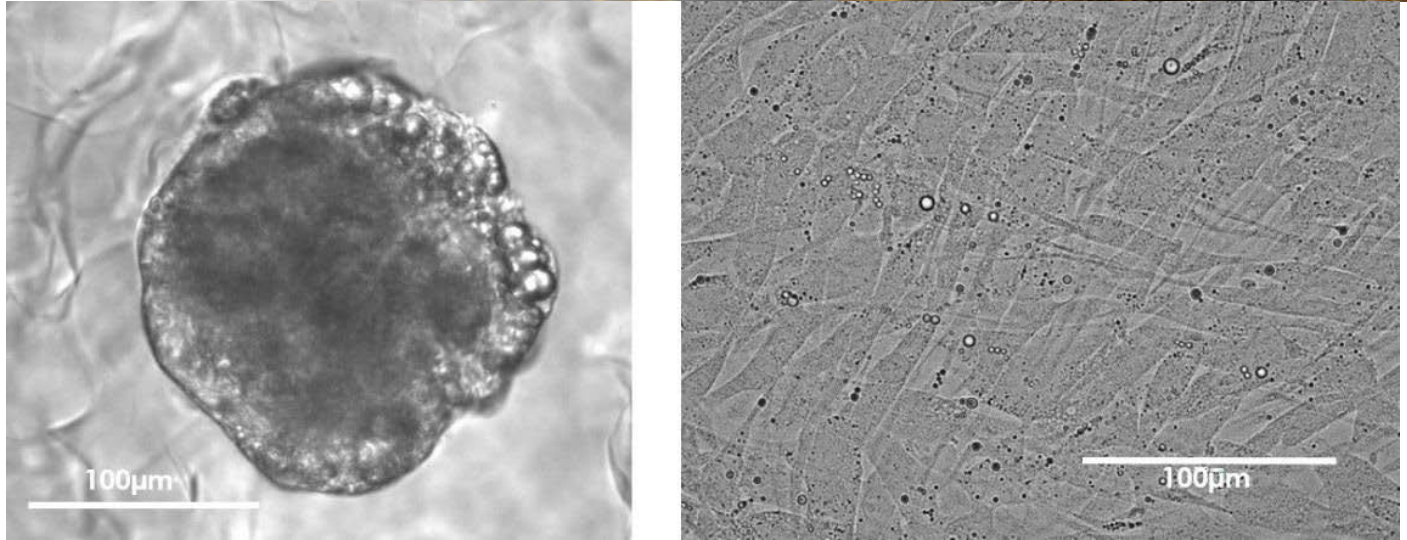


Figure 2: Preadipocyte culture in BIOMIMESYS® Adipose tissue and in 2D at day 7

Preadipocytes, cultured in BIOMIMESYS® Adipose tissue, are morphologically closer to mature adipocytes in vivo, while adipocytes in 2D culture exhibit a fibroblastic appearance. This morphology characteristic of adipocytes shows the establishment of their principal function, fat accumulation, resulting in the presence of vesicles.

In the hydro scaffold, adipocytes form aggregates which increase in size over time.

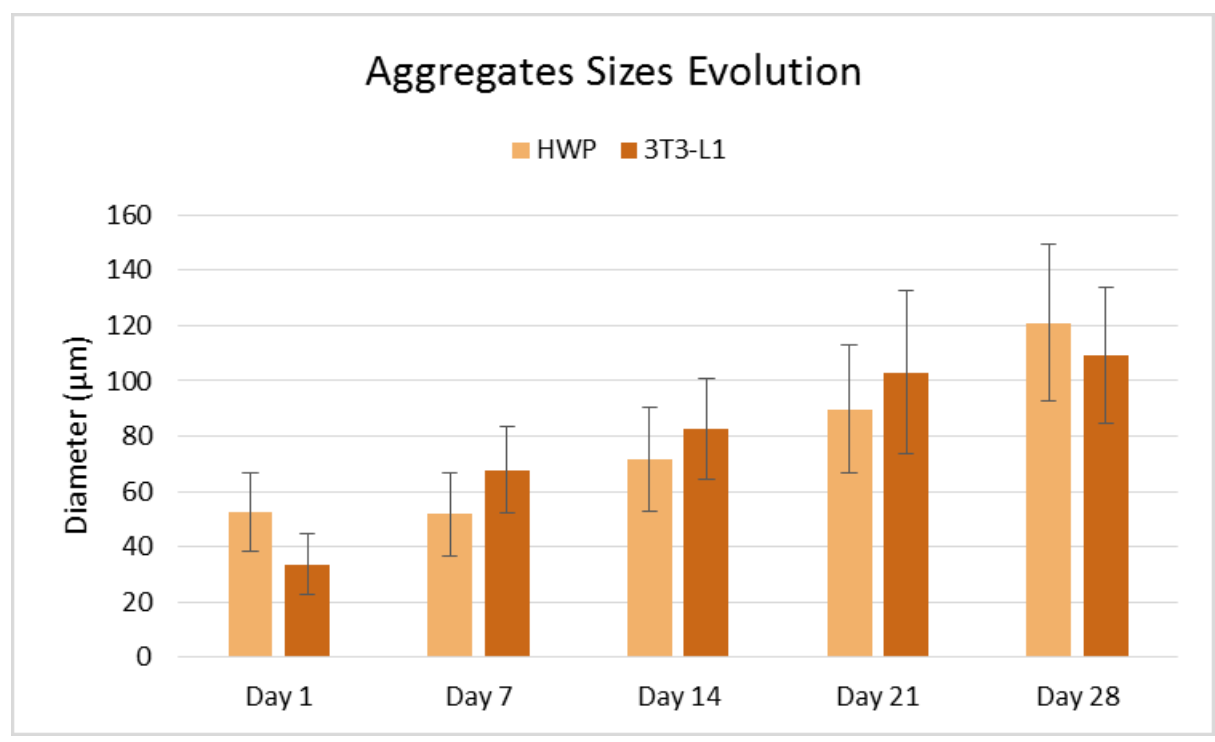


Figure 3: Aggregates sizes of 3T3-L1 and HPW in BIOMIMESYS® Adipose tissue

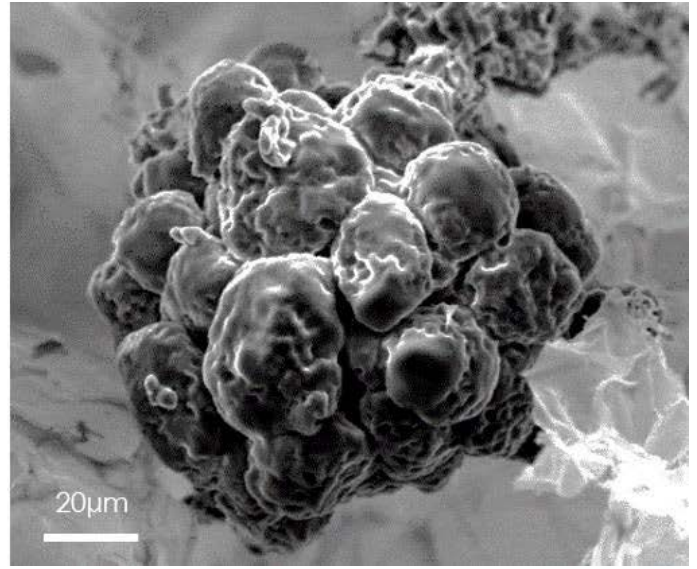
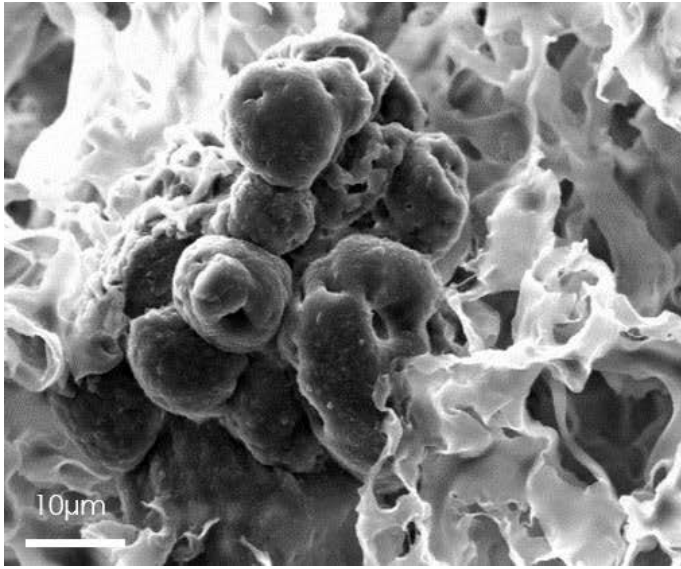


Figure 4: 3T3-L1 (left : day 7) and HWP (right : day 14) cultured in BIOMIMESYS® Adipose tissue

CONCLUSION

BIOMIMESYS® Adipose tissue allows continued growth of multicellular aggregates during at least 4 weeks in culture.

The morphology of the adipocytes in 3D is closest to that found in vivo compared to 2D.

Reference:

Understanding: adipocyte differentiation Gregoire F., Smas C., Sul HS. Physiological reviews, 199