



Technology Offer

Ref.-No. M01/20

A culture platform to cultivate muscle tissue for functional screening and high resolution imaging

Introduction

Skeletal muscle tissue supports essential functions, e.g. breathing, swallowing and limb movement. Strategies to improve muscle function were historically tested in non-human animal models, but in recent years, there is a shift to enlisting microphysiological tissue systems to assess therapeutic efficacy in the context of a human cell assay. To date, all available 3D culture systems to produce skeletal muscle microtissues for testing putative therapies are based on polydimethylsiloxane (PDMS) molds bearing the consequence of immense chemical absorbance of any kind of proteins, thus altering the direct environment of the tissue under study. A downside of PDMS is that poor optical properties and the required relatively large material thickness prevent the use of high numerical aperture objectives which would be required to enable high resolution microscopy and thus make modern 3D microscopy methods like confocal and spinning disk microscopy on living tissue impossible.

Invention

The goal of the present invention is to provide an improved culture platform for cultivating tissue, in particular functional muscle tissue, which may be used for high resolution imaging, precise drug screenings, diagnosis and serum-free media cultivation. The present invention also relates to a corresponding method for observing tissue cultivated in the culture platform.

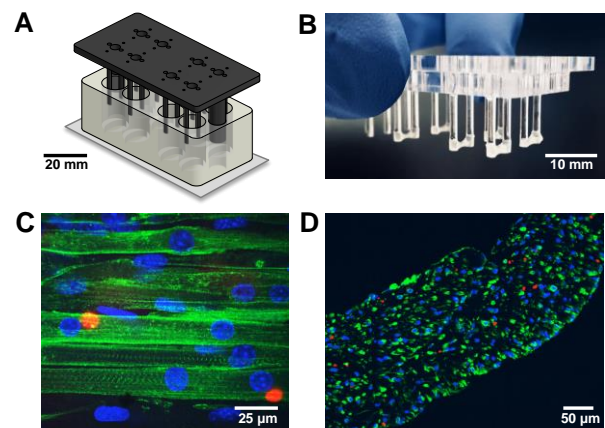


Figure 1: (A) Computer generated depiction of the novel culture platform. (B) Cultivated muscle tissues anchored to the end of the posts of the new platform. (C+D) Representative confocal microscopy images of multinucleated myotubes during progressing maturation of a 2 weeks old muscle tissue (C, longitudinal; D, transverse). Actin is stained in green and nuclei in blue. Cellular force sensors are stained in red.

Advantages of the invention

- enables use of modern 3D microscopy methods
- enables force measurements of functional muscle tissue
- enables use of serum-free media and precise drug screening

Patent situation

Patent application filed.

For further detailed information please contact:

Clinic Invent

Dr. Marion Willenborg
Albert-Schweitzer-Campus 1,
Building D3
D-48149 Muenster, Germany

Tel. +49-(0)251/83 58 904

marion.willenborg@ukmuenster.de