

Integrated cell-spheroid generation and sensing device and applications for compound assays

UNIVERSITÄT LEIPZIG

Life Science Transfer Office

Project: 17012 & 17011

Background /Medical Problem

Using living cells on biosensors is of importance because they give the functional information e.g. of the effect after a stimulus. Mammalian cell based biosensors were therefore developed for fast (high content) and economic determination of effects of active pharmaceutical ingredients in the preclinical phase (secondary screening) of drug approval.

A very good *in vitro* model for an *in vivo* system is a 3D cell culture system with better inter- and intracellular interactions compared to 2D cell layer models. Also the differentiation of stem cells to differentiated cells needs a 3D culture system – e.g. the so-called spheres. Spheres, or spheroids are three-dimensional globular aggregates of several thousands of cells

Technology /Solution

The first invention (GWT 6381) relates to an integrated cultivation and measurement device for label-free detection of impedance spectra and classification of cellular alterations, in particular for generation and characterization of cell-spheroids and monitoring the condition of the cell-spheroids in real time, comprising

- A mounting device for a cultivation chamber plate (i.e. 96-/384-well microtiterplate-microcavity array),
- An amplifier board linked with the contacts for the microelectrodes in the mounting device,
- A rotary shaker, on which the amplifier board and the mounting device for the cultivation chamber plate are placed, and
- A control unit, that is linked with the amplifier board and the rotary shaker, wherein the control unit allows recording, analyzing of data and controlling of the movement of the gyratory shaker.

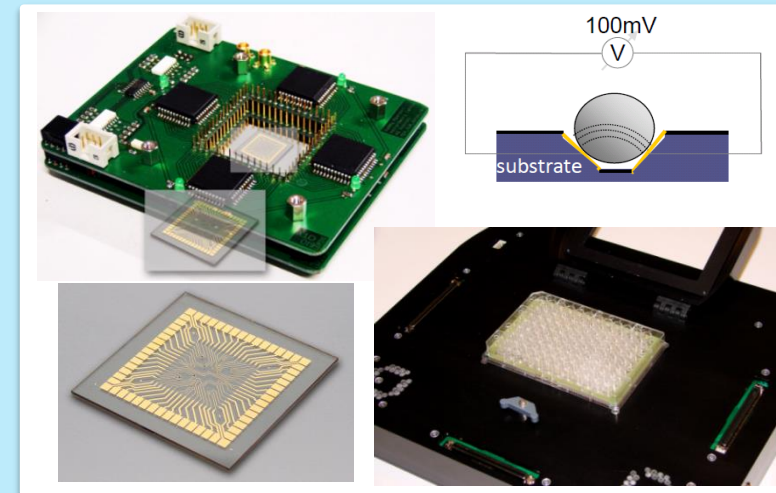


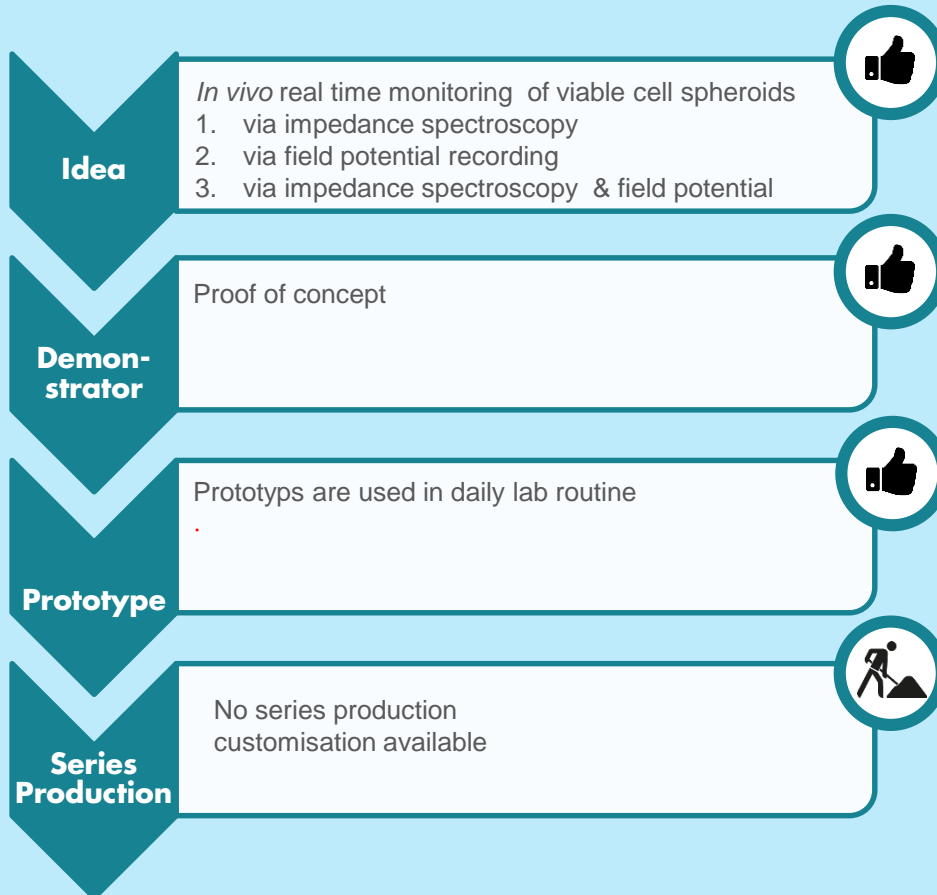
Fig.:Left: device and microcavity chip; Right: scheme of microcavity with spheroid and device with microtiterplate applicable for parallel recording of impedance spectroscopy and field potential on multi electrode arrays

The cultivation chamber plate has several culture reservoirs, wherein the bottom of each culture reservoir forms a micro cavity and each micro cavity features microelectrodes on the micro cavity walls. The mounting device has contacts for the microelectrodes. The invention advantageously allows the automated generation, cultivation and characterization of spheroids, as well as the cultivation and characterization of tissue samples.

The second invention is an advancement and permits de facto at once the parallel recording of impedance spectroscopy and field potential.

Project: 17011

Development Status



Intellectual Property Rights

Patent family „microcontroller for parallel recording WO2013053513 (A1)

Patent family“cell spheroids on rotary shaker and impedance platform“ EP2354217 B1

Patent family Cooperation Options

- License Agreement
- R&D Agreement

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