Microfluidic Device for Cell Aggregates

Microfluidic device for the study of cell aggregates

Georgia Tech inventors have invented a microfluidic device for the culture and observation of cell aggregates. The device can be used broadly in the study of tumor spheroids, cell aggregates, and organoids for applications such as studying fundamental biology, modeling human disease, and performing drug screening. This technology provides the ability to generate cellular aggregates more robustly through precise control of the culture environment, enables high content and high throughput screens, and decreases labor and cost associated with screening.

Summary Bullets

- **Control** - Precise control over the cell culture environment
- **High content assays** – Multiple types of imaging-based assays can be done on the same sample, both during live culture and at end-point
- **High throughput** – Greater number of experiments

Solution Advantages

- **Control** - Precise control over the cell culture environment
- **High content assays** – Multiple types of imaging-based assays can be done on the same sample, both during live culture and at end-point
- **High throughput** – Greater number of experiments
- **Low cost** – Significantly reduced reagent volumes

Potential Commercial Applications

- Pre-clinical drug development: screens, mechanistic studies, etc.
- Toxicology and safety studies
- Fundamental biology
- Studies of disease mechanisms

Background and More Information

Microscale technologies are emerging as powerful tools for tissue engineering and biological studies. Microscale approaches can be used to control culture conditions and perform experimentation, providing a tool to study cell

behavior in vitro. Cell aggregates, tumor spheroids, and organoids are powerful in vitro systems for studying human tissue development, function, and disease. In particular, stem cell derived organoids have emerged as an exciting system for studying human tissues due to their ability to mimic the cell types, structures, and primitive functions of native human tissues. However, existing microscale technologies have been designed for smaller cell aggregates and are not adaptable for culture and screening of much larger organoid tissues.

Inventors

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IP Status

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Publications

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