



Microwells for Controlling Embryoid Body Formation

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a three-dimensional microwell system for culturing stem cells and controlling the size and shape of embryoid bodies.

Overview

Embryonic stem cells form aggregates, called embryoid bodies (EBs), before differentiating into distinct types of cells. Clumps of stem cells can vary widely in size, shape and volume, resulting in non-uniform EBs. Such heterogeneity can cause uncontrolled and inefficient cell differentiation.

The problem is compounded by standard cell culture methods using flat dishes or plates in which colonies grow and distribute unevenly.

The Invention

UW–Madison researchers have developed a three-dimensional microwell system that supports long-term embryonic stem cell culture and the formation of homogenous embryoid bodies. The microwells promote the growth of viable, undifferentiated embryonic stem cells that maintain pluripotency in culture for several weeks.

The use of micrometer-sized, dimensionally constrained wells helps control the size and shape of growing cell clumps, leading to more uniform EB formation. The exact dimensions of the wells can be varied so long as the shape and volume of the colonies cultured within the wells remain consistent.

Applications

- Embryonic stem cell culture and cryopreservation

Key Benefits

- The ability to constrain embryonic stem cell growth in three dimensions has several advantages:
 - Generates EBs of desired shape and size
 - Helps direct embryonic stem cell differentiation
 - Supports efficient, reproducible culture of undifferentiated cells
 - Supports high-throughput screening

Additional Information

For More Information About the Inventors

- [Sean Palecek](#)

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Tech Fields

- [Pluripotent Stem Cells : Culture](#)

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