In Vitro Differentiation of Neural Stem Cells and Neurons from Human Embryonic Stem Cells

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WARF: P04277US
View U.S. Patent No. 7,588,937 in PDF format.

The Wisconsin Alumni Research Foundation is seeking commercial partners interested in developing a simple and efficient method of differentiating human embryonic stem cells into neural stem cells and neurons.

OVERVIEW

Human embryonic stem (hES) cells have the potential to provide a source of specific cell types for research and ultimately, for therapeutic transplantation into humans.

THE INVENTION

UW-Madison researchers have developed a simple and efficient method of differentiating human embryonic stem cells into neural stem cells and neurons for pharmaceutical screening and potential transplant therapy. The system is easily standardized and completely chemically defined. First, hES cells are aggregated and treated with fibroblast growth factors to induce the cells' development into early neural stem cells. Different combinations of growth factors are then used to direct these naive neural stem cells to become progenitors of various types of neurons. The neural progenitors organize into neural tube-like rosettes that can be readily enriched and further differentiated into functional spinal motor neurons, midbrain dopaminergic neurons or forebrain dopaminergic neurons.

APPLICATIONS

- Pharmaceutical and toxicological screening of a compound's effect on neuronal development and function
- Isolating a population of forebrain dopamine neurons, midbrain dopamine neurons or spinal motor neurons at specific developmental stages

KEY BENEFITS

- Allows directed differentiation of hES cells toward a specialized neuronal fate in a standard culture system
ADDITIONAL INFORMATION

Related Technologies
WARF reference number P01258US describes a simple and efficient method of differentiating human embryonic stem cells into neural precursor cells for pharmaceutical screening and potential transplant therapy.

Tech Fields
Drug Discovery - Stem cells
Drug Discovery - Preclinical testing
Pluripotent Cells - Differentiation

CONTACT INFORMATION
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