



## Method of Forming Dendritic Cells from Embryonic Stem Cells

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method for inducing human embryonic stem cells to differentiate into dendritic cells.**

### Overview

Dendritic cells are used as a base for vaccines and in the study of antigen processing within the human body. However, obtaining large quantities of the cells, which are generated in bone marrow, is labor-intensive and risky for the donor.

### The Invention

UW-Madison researchers have developed an *in vitro* method for inducing human embryonic stem cells to differentiate into dendritic cells. Stem cells are cultured successively in three different environments for between seven and 10 days each. The first environment induces them to become hematopoietic cells, the second directs the hematopoietic cells to become myeloid precursor cells, and the third causes the myeloid precursor cells to develop into immature dendritic cells. The resulting dendritic cells are morphologically, phenotypically and functionally similar to dendritic cells *in vivo*.

### Applications

- Production of large amounts of dendritic cells
- Cells can potentially be used in gene therapy to treat cancer or graft rejection.

### Key Benefits

- Provides an *in vitro* method of obtaining large amounts of fully functional dendritic cells and myeloid dendritic cell precursors
- High yielding - greater than 95 percent of cultured stem cells differentiate into dendritic cells
- High production allows multiple vaccinations to be given from one line of cells.
- Low risk of pathogen contamination
- Efficient; only requires exposing stem cells to differentiation-mediating factors, rather than extracting dendritic cells from the blood

### Stage of Development

Successfully used to differentiate multiple human embryonic stem cell lines into dendritic cells.

### Additional Information

#### For More Information About the Inventors

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### Related Intellectual Property

- [View Divisional Patent in PDF format.](#)
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### Tech Fields

- [Drug Delivery : Other drug delivery technologies](#)
- [Pluripotent Stem Cells : Differentiation](#)

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