



## Differentiation of Stem Cells to Endoderm and Pancreatic Cells

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Inventors: Jon Odorico, Brenda Kahan, Nathan Treff

**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods of directing human embryonic stem cells to differentiate into pancreatic islet cells.**

### Overview

Type I diabetes, one of the most common autoimmune diseases in humans, is caused by destruction of pancreatic islet beta cells. Although its symptoms can be controlled, the disease is irreversible.

Transplanting isolated islet cells is an effective treatment for Type I diabetes; however, the extremely limited availability of islet cells has restricted this therapy to only a few patients. Human embryonic stem cells can potentially provide large numbers of islet cells.

### The Invention

UW-Madison researchers have developed methods of directing human embryonic stem cells to differentiate into the lineage of pancreatic islet cells. These methods enable the production of endoderm and pancreatic cells in large numbers.

Three separate techniques, each of which acts independently, are used to increase the percentage of pancreatic progenitor cells in a differentiated cell culture.

1. Selecting embryoid bodies with greater potential for developing into definitive endoderm cells
2. Using a medium containing a growth-enhancing factor that promotes the growth of pancreatic cell types
3. Using both positive and negative selection to eliminate unwanted cells and select for cells of the desired lineage.

In addition, sorting the cells to remove undifferentiated cells eliminates one of the largest barriers to their use in transplantation-the formation of non-malignant tumors, known as teratomas, following transplantation into people.

### Applications

- Increasing the number of islet cells available for transplantation into diabetic patients

### Key Benefits

- Resulting stem cell-derived culture does not have tumorigenic capability and will not form teratomas when transplanted into human subjects

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**For More Information About the Invention**

- [Jon Odorico](#)

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**WARF**  
Wisconsin Alumni Research Foundation

| [info@warf.org](mailto:info@warf.org) | 608.960.9850

#### Tech Fields

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

For current licensing status, please contact Andy DeTienne at [adetienne@warf.org](mailto:adetienne@warf.org) or 608-960-9857

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