

# Multipotent Amniotic Fetal Stem Cells: A Novel Source of Human Stem Cells

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## BACKGROUND

Stem cells have the potential to differentiate into a wide variety of specialized cell types. They can be used for basic research, drug discovery and, ultimately, for the treatment and prevention of disease. However, a major obstacle is that human embryonic stem (hES) cells are derived from the inner cell mass of blastocysts and derivation is encumbered by political and ethical dilemmas. Additionally, human embryonic stem cells have been found to be tumorigenic when injected into immunologically-impaired animals. Furthermore, while human embryonic stem cells potentially differentiate into multiple types of functional cells *in vivo*, controlled, large-scale differentiation of hES cells into specific cell types in culture has not yet been definitively demonstrated.

## TECHNOLOGY DESCRIPTION

Scientists at UC San Diego have developed methods for isolating, identifying, expanding, and differentiating a novel source of epithelioid multipotent amniotic fetal stem cells with typical hES markers. The isolated stem cells have been characterized and have been shown to express typical hES-cell markers (characterized by expression of SSEA3, SSEA4, Tra1-60, Tra1-81, Tra2-54, Oct-4, CD105, and SSEA1).

The technology provides a method for preparing multipotent stem cells from amniotic fluid and includes harvesting from amniotic fluid; culturing, identifying, and isolating epithelioid stem-cells; and expanding the cells to an undifferentiated state. The number of differentiated pathways and the control of these pathways in culture suggest widespread applications of the new cells.

## ADVANTAGES

- ▶ Valuable source of multipotent cells with extensive therapeutic potential.
- ▶ Unhampered source of human stem cells—no political or ethical obstacles.
- ▶ Can be propagated in an undifferentiated state in culture for long periods of time (about 60 doublings) and are able to differentiate into all three primary germ cells.
- ▶ Cells also appear to be devoid of tumorigenic properties.

## INTELLECTUAL PROPERTY INFORMATION

See U.S. Letters Patent [7,569,385](#).

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	<a href="#">7,569,385</a>	08/04/2009	2005-041
Patent Cooperation Treaty	Reference for National Filings	<a href="#">WO/2005/017117</a>	02/24/2005	2005-041

Additional Patent Pending

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## INVENTORS

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## OTHER INFORMATION

### CATEGORIZED AS

- ▶ **Medical**
- ▶ Other
- ▶ Research Tools
- ▶ Stem Cell

### RELATED CASES

2005-041-0, 2005-042-2

