

Somatic pluripotent cells derived from adult tissue

Tech ID: 23105 / UC Case 2010-154-0

BACKGROUND

A cornerstone of regenerative medicine is the study and use of pluripotent stem cells for the purpose of wound healing, tissue repair, and organ transplantation. Existing forms of pluripotent cells include embryonic stem (ES) cells and induced pluripotent stem (iPS) cells. The ethical concerns and limited availability associated with ES cells, and the difficulties in generating large quantities of iPS cells underscore the necessity of finding additional sources of pluripotent cells.

TECHNOLOGY DESCRIPTION

Investigators at UCSF have identified and isolated cells from healthy breast tissue that retain their ability to become different cell types, achieving the discovery of a new and somatic (non-embryonic) source of pluripotent stem cells. In culture and in mice, investigators differentiated the cells into derivatives of tissue from all three germ layers: endoderm (intestine, pancreas), mesoderm (bone, heart), and ectoderm (breast tissue, nervous system).

The rare population of breast tissue cells, termed endogenous plastic somatic (ePS) cells, behaves like hES and iPS cells in its ability to self-renew and form functional tissue derivatives. Unlike these other pluripotent cells, ePS cells are mortal and genomically stable. They are able to undergo a large but finite number of divisions. Hence, ePS cells can expand in cell number but retain genetic stability and therefore are less prone to forming tumors or developing into cancer.

This technology provides methods for identifying and isolating ePS cells from a subject and enables investigation of these cells for therapeutic purposes.

APPLICATIONS

- ▶ Potential to rebuild diseased and/or damaged tissue, organs
- ▶ Potential to rescue cell and/or tissue function in cases of neurodegenerative diseases, heart disease, diabetes, etc.
- ▶ Capacity to identify additional populations of pluripotent cells located in other tissues, in females and males
- ▶ Ability to study mechanisms of pluripotency, self-repair, and regeneration

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OTHER INFORMATION

KEYWORDS

regenerative medicine, stem cell

CATEGORIZED AS

- ▶ [Medical](#)
- ▶ [Stem Cell](#)

RELATED CASES

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ADVANTAGES

- ▶ Genetically stable, mortal cell population derived from adult tissue
- ▶ Eliminates ethical and moral issues concerning use of embryonic stem cells
- ▶ Avoids adverse immune responses associated with organ transplantation
- ▶ Generates over one billion daughter cells starting from single cell
- ▶ Provides alternative to existing sources of pluripotent cells

RELATED MATERIALS

- ▶ [Rare somatic cells from human breast tissue exhibit extensive lineage plasticity. Roy, S. et al. PNAS \(2013\)](#)

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,850,466	12/26/2017	2010-154

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