A Method and Apparatus to Inactivate Stem Cell Nuclei

Tech ID: 18791 / UC Case 2006-227-0

BACKGROUND

Stem cells may hold the key to future cures for many diseases. These are embryonic cells that are thought to have the potential to develop in any kind of tissue: liver, kidney, brain, etc. There is great scientific, medical, and economic interest in any technology that can facilitate the therapeutic use of stem cells. The use of stem cells in scientific research has initiated a political debate regarding the ethics of deriving stem cells from human embryos. Thus any technology that would obviate or reduce the need to use human embryos would have widespread acceptance. Additionally, any technology that can facilitate research in stem cell biology will be of great value since relatively little is presently know about the overall biology of these complex cells. It has been recently reported that it is possible to cause reprogramming of somatic (body) cell nuclei after fusion with human embryonic stem cells. One of the technical barriers that need to be overcome before human embryonic stem cells can be used for therapeutic purposes is the elimination of the stem cell's chromosomes either prior to or following cell fusion.

TECHNOLOGY DESCRIPTION

Researchers at the University of California, Irvine in collaboration with scientists from the University of Massachusetts Medical School, are developing a method to remove or inactivate the nucleus of the human embryonic stem (hES) cell in the fused or pre-fused cell. Researchers are developing a system to differentiate between the stem cell and the somatic cell so that the stem cell nuclei can be inactivated. In effect, the cells can be irradiated with laser technology in several minutes, leaving a reasonably high number of cells that contain the cytoplasm of the stem cell but the programmed or to-be reprogrammed nucleus of the somatic cell. Prior to the development of this technique, there was no known way to enucleate cells without destroying the integrity of the cell (e.g. using a needle or using UV light which is generally damaging to the cell).

APPLICATIONS

The development of a system to readily inactivate nuclei and nuclear chromosomes in stem cells will be of great value for scientists looking at stem cell biology. The invention proposed by UC researchers offers a unique approach to answer questions posed by experts in the field of stem cell research. The invention would allow for high cell throughput inactivation of nuclei and nuclear chromosomes in cells that are growing flat in a dish or unattached in suspension. This proposed technology will facilitate research in stem cell biology and provide scientists an investigative tool to facilitate the therapeutic use of stem cells.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,321,990	04/26/2016	2006-227

CONTACT

Alvin Viray
aviray@uci.edu
tel: 949-824-3104.



OTHER INFORMATION

CATEGORIZED AS

- » **Medical**
  - » Devices
- » **Optics and Photonics**
  - » All Optics and Photonics
- » **Research Tools**
  - » Nucleic Acids/DNA/RNA
  - » Other

RELATED CASES

2006-227-0

UCI Beall
Applied Innovation

5270 California Avenue / Irvine,CA
92697-7700 / Tel: 949.824.2683

© 2009 - 2016, The Regents of the University of California
Terms of use
Privacy Notice