Compositions and Methods for Regulation of Stem Cell Survival, Proliferation, and Differentiation

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Technology description

Background:

Regenerative medicine is the process of using stem cells or related products to repair or repopulate organs or tissues damaged by a disease. Stem cell-based regenerative therapies may be used to heal or treat a wide range of conditions including cardiovascular disease, cancer, osteoporosis, Alzheimer’ s disease, Parkinson’ s disease, diabetes, renal failure, and spinal cord injuries.

Biomedical approaches to clinical therapies in regenerative medicine may oftentimes involvethe collection and cultivation of stem cells in order to generate sufficient numbers of normal stem cells for the purpose of cellular therapy. Currently, however, there are no reliable methods to determine the stem cell potency of repairing or regenerating damaged tissues. This invention discloses a novel approach for identification, isolation, and cultivation of stem cells useful for regenerative medicine.

Market:

The broad indications place a tremendous demand and market for regenerative medicine. The global market for stem cells and stem cell products was $3.8 billion in 2011 and expected to reach $6.6 billion by 2016.

Advantages

Scientists at The University of Texas Health Science Center at Houston (UTHealth) have identified a protein that modulates stem cell growth and differentiation via the ubiquitination pathway. This technology:

·Identifies and details a protein which may regulate expression of cellular proteins important for growth, adhesion, apoptosis and differentiation of embryonic and adult stem cells from various tissues;

·Describes a potential method ofmodulating stem cell adhesion to matrix or stem cell-stem cell interaction; and

·Describes a potential method of modulating the protein to deter the differentiation of stem cells, in order to facilitate propagation in culture, or to promote the differentiation of stem cells.

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