



Method for Producing a Functional Neuron (*Rameshwar, NJMS 04-50*) *CNS/Stem Cells*

Background

Experimental evidence shows that stem cells could have future benefits in the area of regenerative medicine. Mesenchymal stem cells (MSCs) are major adult bone marrow stem cells with multilineage potential. They are easily obtained from adult bone marrow, and can be expanded by *in vitro* procedures. MSCs have been shown to transdifferentiate into cells of other germ layers and the generation of MSCs into neurons as characterized by morphology and action potential has been studied. However synaptic transmission has not been reported for neurons derived from MSCs. **The present invention describes a method for generating functional neurons from adult human MSCs.**

Description of the Technology

The present invention is a method for producing a functional neuron. The transdifferentiation of MSCs into neurons is determined by phenotypic and electrophysiological analysis. In particular embodiments, the functional neurons are subsequently polarized by contacting the functional neuron with at least one selected growth factor. Isolated functional neurons and polarized functional neurons are also provided. The neurons provided by the method of the present invention are capable of synaptic transmission, as evident by immunofluorescence for synaptophysin, and can be used in neuronal repair.

Applications

- For treatment or amelioration of a variety of diseases or conditions including, but not limited to, neurodegenerative diseases such as Parkinson's disease, Alzheimer's disease, Down's syndrome, prion disease, polyglutamine disease, and amyotrophic lateral sclerosis; cerebral ischemia; demyelination; head injury; spinal damage; cerebral infarct and the like.

Patent Status

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