Method Of Selecting Cell Populations Enriched With Desired Cells. (Hadasit)

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Need:

Drugs used to treat Parkinson's disease include dopamine precursors and agonists, inhibitors of dopamine breakdown, and other symptomatic treatments. This >$3B market is growing with aging worldwide population, and is unsatisfied in that current drugs have significant adverse effects and often lose their effectiveness over time. These drugs are symptomatic without affecting the underlying disease process. There is a need for a method for obtaining an enriched population of differentiated neuronal cells for multiple uses in regenerative medicine such as transplantation of neurons in PD.

Innovation:

A method for obtaining an enriched population of differentiated neuronal cells derived from undifferentiated stem cells (SCs). The differentiated neuronal cells exhibit a cytoskeletal components profile which provides the cell with a resistance to a cytotoxic apoptotic agent such as microtubule-stabilizing taxanes.

Findings:

In vitro POC: Paclitaxel selectively induces cell death of non-neuronal early differentiating and undifferentiated cells but does not affect mature neurons.

In Vivo POC: transplantation of selected differentiated neuronal cells in vivo was not resulted in the appearance of teratoma / neural tumor formation.

Indications / Applications:

Therapeutic aims: regenerative cell therapy of the nervous system - transplantation of neurons for PD and other neurodegenerative diseases.

Drug-screening platforms: selection of neuronal populations to be used as an In vitro model for drug discovery and development and In vitro high throughput screening essay with DA neurons.

Competitive Advantages:

The method provides a strategy to avoid teratomas, neural tumor formation and the existence of unwanted cells within transplanted cell population. Enriched neuronal populations with an improved safety profile offer the opportunity to provide a normal neuronal population that restores function for PD patients, hence eliminating the need for many current PD drugs. Future indications could extend to other neurodegenerative diseases include Alzheimer’s. These cells also offer the opportunity to discover and evaluate mechanism-based PD drugs.

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