Stem Cell Research
In the Treatment of Parkinson's disease
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Frank Breau
Dept. of Electrical and Computer Engineering
University of Rhode Island, Kingston RI

Parkinson's Disease

- Neurodegenerative disorder of the central nervous system
- Brought on by the gradual loss of dopamine producing neurons
- Results in shaking, poor balance, deterioration of motor functions, and generally decreased mobility
- Brought into the spotlight when Michael J. Fox was diagnosed with it two years ago

Stem Cell Research

- Stem cells are unspecialized cells capable of reproducing themselves for long periods of time through cell division
- Stem cells can differentiate into specialized cells with desirable properties (nerve tissues, heart muscle, insulin producing pancreatic cells, etc) with the proper stimulus
- This makes them a potential treatment for heart disease, Parkinson's, and diabetes.

Proposed Treatments

- Since it is known what kind of cells are needed to alleviate Parkinson's symptoms, it may be the first disease widely treatable by stem cell transplants
- Stem cells are stimulated in a lab to become the dopamine producing neurons that Parkinson's patients lack
- When transplanted into the patient, they reproduce themselves and replace the missing DA nerve cells

Recent Progress

- A rat model of Parkinson's was given this treatment (with mouse stem cells) and showed greatly improved motor control and function
- The stem cells were stimulated to differentiate into DA producing nerve cells with the addition of the gene Nurr1

Human Applications

- The same basic procedure is followed with humans, but with human stem cells
- Two years ago, a patient underwent this treatment
- The stem cells he received were his own, avoiding issues with tissue rejection and controversy over embryonic stem cells
- Great progress was made, and the patient's symptoms disappeared shortly after the treatment
- Two years later, he is still without symptoms
- The refining of a method to mass produce the DA neuron stem cells will lead to the widespread treatment of Parkinson's patients