disease for which this type of therapy holds particular promise is the degenerative neurological disorder Parkinson's disease, which is characterized by symptoms related to movement.

The laboratory of Memorial Sloan Kettering stem cell biologist Lorenz Studer has been focused on developing therapeutically relevant cells for more than a decade. Working with embryonic stem (ES) cells from both mice and humans, Dr. Studer has sought ways to induce these cells – which have the potential to form almost any cell type found in the body – to develop into nerve cells, or neurons, that produce dopamine. Dopamine is the chemical that is lost in the neurons of Parkinson's patients.

Dr. Studer's laboratory is also investigating how ES cells might be engineered to become healthy brain cells that could replace brain cells that are injured or lost in the course of treatment for cancer – either during surgery or treatment with radiation therapy.

In November 2011, Dr. Studer's team published a study in the journal *Nature* on a new strategy for using ES cells to graft human dopamine neurons into animal models of Parkinson's disease. In previous research, the investigators were able to show that ES cells could be induced to form dopamine-producing neurons in a dish, but it had been difficult to coax them into growing and making the proper connections once they were transplanted into the diseased brain of an animal model of Parkinson's disease.

The new research suggests that the team has now created cells that can grow and survive long term after being transplanted into living brains. In addition, the implanted cells did not grow at an uncontrolled rate, another drawback seen in earlier studies. "When we injected these cells into animal models, the cells not only survived but were functionally active in the brain," Dr. Studer explains. "This means that problems with movement seen in the animals were corrected. In addition, the effects of the therapy lasted for several months."

Much additional work is needed in the laboratory before the cells can be tested in clinical trials in Parkinson's patients. "We still have a long way to go," Dr. Studer says, "but we are optimistic that one day this will be a viable treatment for patients."

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