

# Transplanted nerve cells survive a quarter of a century in a Parkinson's disease patient

May 3 2016

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In the late 1980s and over the 1990s, researchers at Lund University in Sweden pioneered the transplantation of new nerve cells into the brains of patients with Parkinson's disease. The outcomes proved for the first time that transplanted nerve cells can survive and function in the diseased human brain. Some patients showed marked improvement after the transplantation while others showed moderate or no relief of symptoms. A small number of patients suffered unwanted side-effects in the form of involuntary movements.

Ever since the first transplantations were carried out, a fundamental question has been whether the transplanted cells and their [neural connections](#) could survive and function over time despite ongoing disease in the patient's brain. Now researchers at Lund University have proven that transplanted [nerve cells](#) can survive for many [years](#) and restore normal dopamine production in the transplanted part of the brain. The study has been published by the distinguished scientific journal *Proceedings of the National Academy of Sciences*.

"Our findings show that transplanted nerve cells can survive and function for many years in the diseased human brain", says Professor Olle Lindvall, one of the researchers behind the study. "This is the first time a patient has shown such a well-functioning transplant so many years after transplantation of nerve cells to the brain. At the same time, we have observed that the transplant's positive effects on this patient gradually disappeared as the disease spread to more structures in the brain."

The researchers followed a patient with Parkinson's disease who underwent transplantation of dopamine-producing nerve cells 24 years before death. The patient showed such marked improvement that medication with L-dopa was no longer necessary three years after the transplantation. Brain-imaging technology allowed the researchers to show that dopamine function was completely normal in the transplanted brain structure ten years after the operation. The new study analyses the patient's brain and the researchers can now prove that the transplanted dopamine-producing cells and their normal neural connections are still present almost a quarter of a century after the operation.

"This gives us a better understanding of how Parkinson's disease spreads in the brain", explains Professor Jia-Yi Li, who led the study together with Olle Lindvall and Anders Björklund.

"This study is completely unique", says Professor Anders Björklund. "No transplanted Parkinson's patient has ever been followed so closely and over such a long period. The patient was also unique in the sense that the nerve cells were only transplanted to one hemisphere of the [brain](#), which meant that the other, which did not receive any transplant, could function as a control. What we have learnt from the study of this patient will be of great value for future attempts to transplant dopamine-producing nerve cells obtained from stem cells, a new development led by researchers in Lund."

**More information:** Wen Li et al, Extensive graft-derived dopaminergic innervation is maintained 24 years after transplantation in the degenerating parkinsonian brain, *Proceedings of the National Academy of Sciences* (2016). [DOI: 10.1073/pnas.1605245113](https://doi.org/10.1073/pnas.1605245113)

Provided by Lund University

Citation: Transplanted nerve cells survive a quarter of a century in a Parkinson's disease patient (2016, May 3) retrieved 27 April 2024 from <https://medicalxpress.com/news/2016-05-transplanted-nerve-cells-survive-quarter.html>

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