

# Parkinson's disease may start in the gut

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Parkinson's disease is strongly linked to the degeneration of the brain's movement center. In the last decade, the question of where the disease begins has led researchers to a different part of the human anatomy. In 2003, the German neuropathologist Heiko Braak presented a theory suggesting that the disease begins in the gut and spreads to the brain. The idea has since, despite vocal critics, gained a lot of ground. Researchers at Lund University in Sweden now present the first direct evidence that the disease can actually migrate from the gut to the brain.

The so-called Braak's hypothesis proposes that the [disease](#) process begins in the digestive tract and in the [brain](#)'s center of smell. The theory is supported by the fact that symptoms associated with digestion and smell occur very early on in the disease.

Researchers at Lund University have previously mapped the spread of Parkinson's in the brain. The [disease progression](#) is believed to be driven by a misfolded protein that clumps together and "infects" neighboring cells. Professor Jia-Yi Li's research team has now been able to track this process further, from the [gut](#) to the brain in rat models. The experiment shows how the toxic protein, alpha-synuclein, is transported from one cell to another before ultimately reaching the brain's movement center, giving rise to the characteristic movement disorders in Parkinson's disease.

"We have now been able to prove that the disease process actually can travel from the peripheral nervous system to the central nervous system, in this case from the wall of the gut to the brain. In the longer term, this

may give us new therapeutic targets to try to slow or stop the disease at an earlier stage", says Professor Jia-Yi Li, research group leader for Neural Plasticity and Repair at Lund University.

The research team will now carry out further studies in which the mechanisms behind the transport of the harmful protein will be examined in detail. The current study suggests that the protein is transferred during [nerve cell communication](#). It is at this point of interaction that the researchers want to intervene in order to put a stop to the further spread of the disease.

**More information:** "Direct evidence of Parkinson pathology spread from the gastrointestinal tract to the brain in rats." *Acta Neuropathologica*. [link.springer.com/article/10.1007/s00401-014-1343-6](https://link.springer.com/article/10.1007/s00401-014-1343-6)

Provided by Lund University

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