

Building a
healthier future

Cell & Gene Therapy



Parkinson's Disease

What is Parkinson's Disease?

Parkinson's Disease, or PD for short, is a chronic, progressive disease of the nervous system marked by the degeneration of cells that produce the neurotransmitter dopamine — a chemical messenger responsible for regulating body movements, among other functions.

PD often starts with an uncontrollable tremor in one hand and a feeling of stiffness in the body. Over time, other symptoms may develop like slurred speech, shuffling gait, loss of sense of smell, dementia, and depression. With time, symptoms worsen, making simple tasks like climbing stairs, writing a letter, or eating and drinking very challenging and heavily impacting the quality of life.

Parkinson's disease is a very common neurodegenerative movement disorder¹, affecting over 10 million people worldwide².



Did you know that men are 50% more likely to develop PD than women³, and in most people, symptoms first appear around the age of 60⁴?

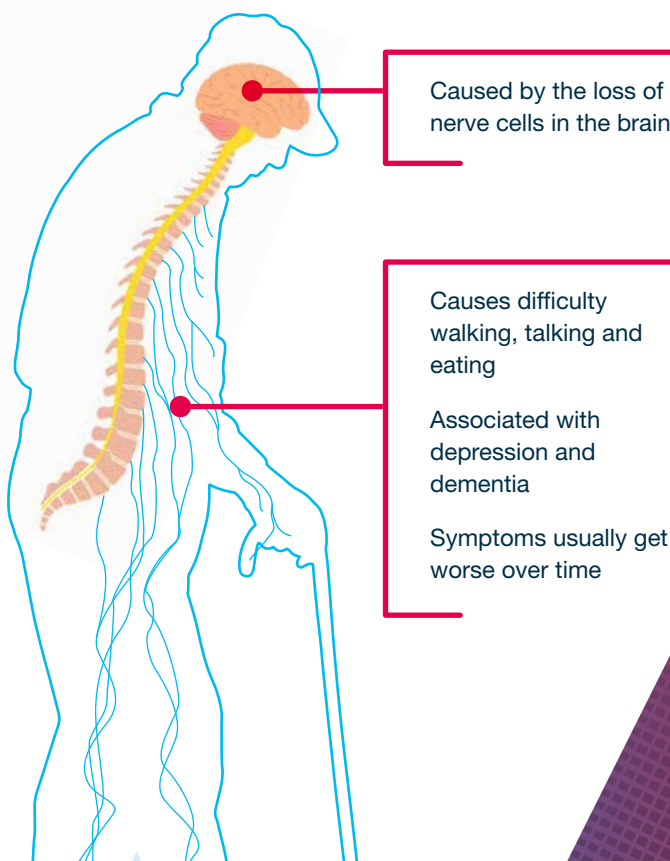
Is there a treatment for Parkinson's Disease?

The current treatment focuses on substituting low internal dopamine levels with external dopamine. While this eases symptoms at the beginning, it causes more and more side effects as the disease progresses. This is because the right external dopamine levels cannot be maintained any more.

Over time this therapy also becomes less and less effective, meaning that symptoms come back, and patients get worse. This is because the root cause of the disease, the irreversible loss of neurons, is not addressed. Many of the costs associated with the disease also present an economic burden for patients and their families.

The estimated costs of treating PD:

- €13.9 bn estimated annual cost of treating PD in Europe⁵
- \$26.5 bn estimated annual cost of treating PD in US⁶





What if we could use cell therapy or gene therapy to tackle Parkinson's Disease?

Cell therapy and gene therapy could offer a massive paradigm shift from current treatment options and hold the potential to revolutionize the way we treat diseases. These therapies focus on the source of the disease rather than only treating or minimizing symptoms. With these approaches we could potentially stop or even reverse diseases like PD. At Bayer we are taking a two-fold therapeutic approach to addressing PD:

Gene Therapy

We're testing a treatment that could prompt the brain's own cellular machinery to reinvigorate nerve cells that degenerate due to PD.



Asklepios BioPharmaceutical (AskBio) is working on a technology that introduces a naturally occurring gene into the brain. That gene aims to promote restoration and survival of dopamine-producing neurons.



Cell Therapy

We're working on a PD treatment to replace lost dopamine-producing neurons in the brain with new ones.



BlueRock Therapeutics' cell therapy candidate could potentially slow the progression of the disease or perhaps even restore the patient's lost motor function.



Bayer's commitment to helping Parkinson's patients and beyond

Whereas conventional medicines often need to be taken continuously for months, years, or even for life, cell therapy and gene therapy have the potential to be one-time treatments with lasting results.

Together with AskBio and BlueRock, we are committed to exploring the potential of cell therapy and gene therapy to treat diseases beyond just Parkinson's Disease.



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- 1 Ou Z et al. Front. Public Health, 2021
- 2 Parkinson's Foundation. Statistics
- 3 Moisan F, Kab S, Mohamed F, et al. Journal of Neurology, Neurosurgery & Psychiatry 2016
- 4 Parkinson's Disease: Challenges, Progress, and Promise. National Institute of Neurological Disorders and Stroke. <https://www.ninds.nih.gov/Disorders/All-Disorders/Parkinsons-Disease-Challenges-Progress-and-Promise>. [Accessed March 2021]
- 5 Gustavsson A et al. Eur Neuropsychopharmacol. 2011
- 6 Yang et al. Nature, 2020

For more information about the clinical trials check:
AskBio: www.askbio.com/gene-therapy-clinical-trials/
BlueRock: www.bluerocktx.com/clinical-trials/

