

DOI: <https://doi.org/10.56936/18290825-3.19v.2025-4>**THE ROLE OF ALIPHATIC POLYAMINES AND α -SYNUCLEIN IN THE FORMATION OF PERIPHERAL MECHANISMS INVOLVED IN THE PARKINSON'S DISEASE INDUCTION****AVAGYAN A.S.^{1*}, MURADYAN A.A.², MAKLETSOVA M.G.³,
POLESHCHUK V.V.⁴, ZILFYAN A.V.¹**¹ Scientific Research Center, Yerevan State Medical University after M. Heratsi, Yerevan, Armenia² Department of Urology and Andrology, Yerevan State Medical University, Yerevan, Armenia³ Department of Biology and General Pathology, Don State Technical University, Rostov-on-Don, Russia⁴ Laboratory of Neurochemistry, Scientific center of neurology and neuroscience, Moscow, Russia*Received 11.08.2024; Accepted for printing 15.05.2025***ABSTRACT**

Currently, aspects of the pathogenesis of Parkinson's disease associated with a disorder of aliphatic polyamine metabolism not only in neurons and gliocytes of the brain, but also in parenchymatous and stromal cells of peripheral internal organs are being widely developed.

In the development of the pathological process according to the "brain-first" subtype, the leading role in Parkinson's disease should be given to central mechanisms, in which aliphatic polyamines produced in the central nervous system directly participate in the induction of neurodegenerative disorders. Enhanced synthesis of aliphatic polyamines in dopaminergic neurons is accompanied by aggregation and fibrillation of α -synuclein *in situ*, which participates in the formation of Lewy bodies. A similar polyamine-dependent mechanism of α -synuclein aggregation at the level of neurons and glial cells of the brain has long been considered established.

When the pathological process unfolds according to the "body-first" subtype, peripheral mechanisms are more interested in the pathogenesis of Parkinson's disease, in which, in our opinion, an important role is given to the increased synthesis of aliphatic polyamines in a number of peripheral organs, primarily in their peripheral nerve endings. In the same nerve structures, aggregation of α -synuclein occurs, which retrogrades through the blood-brain barrier, causing a symptom complex in dopaminergic neurons that is pathognomonic for Parkinson's disease.

Our own studies on the determination of aliphatic polyamines in the blood plasma of patients suffering from Parkinson's disease were carried out by us taking into account the clinical characteristics of the degrees of disability and gradation by stage. Thus, it was found that the highest levels of all three polyamines were observed at the first stage of disability. A sharp decrease in the level of all three polyamines occurred at the fourth stage. In our opinion, the levels of polyamines in the peripheral blood quite adequately reflect the processes of formation of peripheral mechanisms interested in the induction of Parkinson's disease, especially in the early stages of the disease.

KEYWORDS: Parkinson's disease, pathogenesis, brain-first, body-first, α -synucleins, aliphatic polyamines.**CITE THIS ARTICLE AS:**

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