



# DYSREGULATION OF THE DOPAMINE SYSTEM IN STROKE: IMPACT OF NEUROPOLEN

Major Gheorghe Giurgiu<sup>1</sup>, Prof Dr Med Manole Cojocaru<sup>2,3</sup>

<sup>1</sup>Deniplant-Aide Sante Medical Center, Biomedicine, Bucharest, Romania

[deniplant@gmail.com](mailto:deniplant@gmail.com); Telephone: +40 744 827 881

<https://orcid.org/0000-0002-5449-2712>

<sup>2</sup>Academy of Romanian Scientists

<sup>3</sup>Titu Maiorescu University, Faculty of Medicine, Bucharest, Romania

[cojocaru.manole@gmail.com](mailto:cojocaru.manole@gmail.com); Telephone: +40 723 326 663

<https://orcid.org/0000-0002-7192-7490>



**Gut bacteria play an important role in the digestion of food, immune activation, and regulation of entero-endocrine signaling pathways, but also communicate with the central nervous system through the production of specific metabolic compounds, e.g., dopamine.**

**Afferent vagus nerve fibers that transport signals from the gastro-intestinal tract and gut microbiota to the brain are also linked to receptors in the esophagus, liver, and pancreas.**



**Dopamine is a neurotransmitter that plays a critical role both peripherally and centrally in vital functions such as cognition, reward, satiety, voluntary motor movements, pleasure, and motivation.**

**Optimal dopamine bioavailability is essential for normal brain functioning and protection against the development of neurological diseases.**

**Emerging evidence shows that gut microbiota have significant roles in maintaining adequate concentrations of dopamine via intricate, bidirectional communication known as the microbiota-gut-brain axis.**



**The vagus nerve, immune system, hypothalamus–pituitary–adrenal axis, and microbial metabolites serve as important mediators of the reciprocal microbiota-gut-brain signaling**

**Furthermore, gut microbiota contain intrinsic enzymatic activity that is highly involved in dopamine metabolism, facilitating dopamine synthesis as well as its metabolite breakdown.**

**We briefly describe the mechanisms of reciprocal communication between peripheral and central nervous systems via the gut-brain axis and the role of gut microbiota in this process.**



**The effects of gut dysbiosis on dopamine bioavailability and the subsequent impact on dopamine-related pathological conditions such as stroke are also discussed.**

**Understanding the role of gut microbiota in modulating dopamine activity and bioavailability both in the periphery and in the central nervous system can help identify new therapeutic targets as well as optimize available methods to prevent, delay, or restore dopaminergic deficits in neurologic and metabolic disorders.**



**Several studies have shown that changes in the gut microbiome composition through manipulation techniques such as probiotic administration or fecal microbiota transplant can cause changes in brain activity and cognitive behavior by modulating neurotransmitter activity.**

**The influence of gut microbiota is not limited to the gut but is a major player in the bidirectional communication between the gut and the brain.**

**For example, disturbance of the healthy intestinal microbiota has been associated with numerous pathological conditions including stroke.**



**Dopamine, in particular, has drawn significant interest due to its contribution to pathological conditions in both the gastro-intestinal tract and the central nervous system.**

**It is not clear yet whether changes in the gut microbiota are the results of faulty brain signaling or whether they can actually drive brain disorders.**

**It is known, however, that several intestinal microbes are involved in neurotransmitter synthesis such as dopamine.**



**Changes in some of these neurotransmitters such as decreased dopamine concentrations have been linked with the etiology of stroke.**

**These neurotransmitters activate nerve ganglia in the myenteric and submucosal plexuses of the enteric nervous system and are important mediators in the interface between the intestinal tract and the brain through the gut-brain axis.**

**Several intestinal microbial species have prominent roles in neuroprotection of dopaminergic neurons.**



**Neuropolen is a nutraceutical (food with a dual role of nutrition and health) for the regeneration of destroyed nerve cells.**

**The use of the components of Neuropolen in the solution of human medical conditions was made long before the appearance of the product under this name.**



**Neuropolen is a natural neuroregenerator of the nerve cell.**

**Neuropolen contains freeze-dried pollen from Deniplant plants, cocoa bean and carob seed powder, brewer's yeast.**

**Combining them we managed to obtain a product with a wide spectrum of action without side effects or side effects.**

**The components themselves are foods that we can eat daily.**

**That's why Neuropolen has the slogan "Eat and heal"**





## Conclusions

**Substantial evidence supports the involvement of microbiota-gut-brain signaling in dopamine release, synthesis, and bioavailability.**

**The gut microbiota has a clear impact on neurotransmitters including dopamine.**

**The gut microbiota is involved in modulating neurotransmitters like dopamine.**

**There is a strong relationship between the gut microbiome and dopamine. Some gut microorganisms have been found to have neuroprotective effects on dopaminergic neurons, slowing dopamine depletion.**



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