Gut Microbiome Alterations in Parkinson's Patients

Prelims: *Current events of national and international importance | Health*

Why in News?

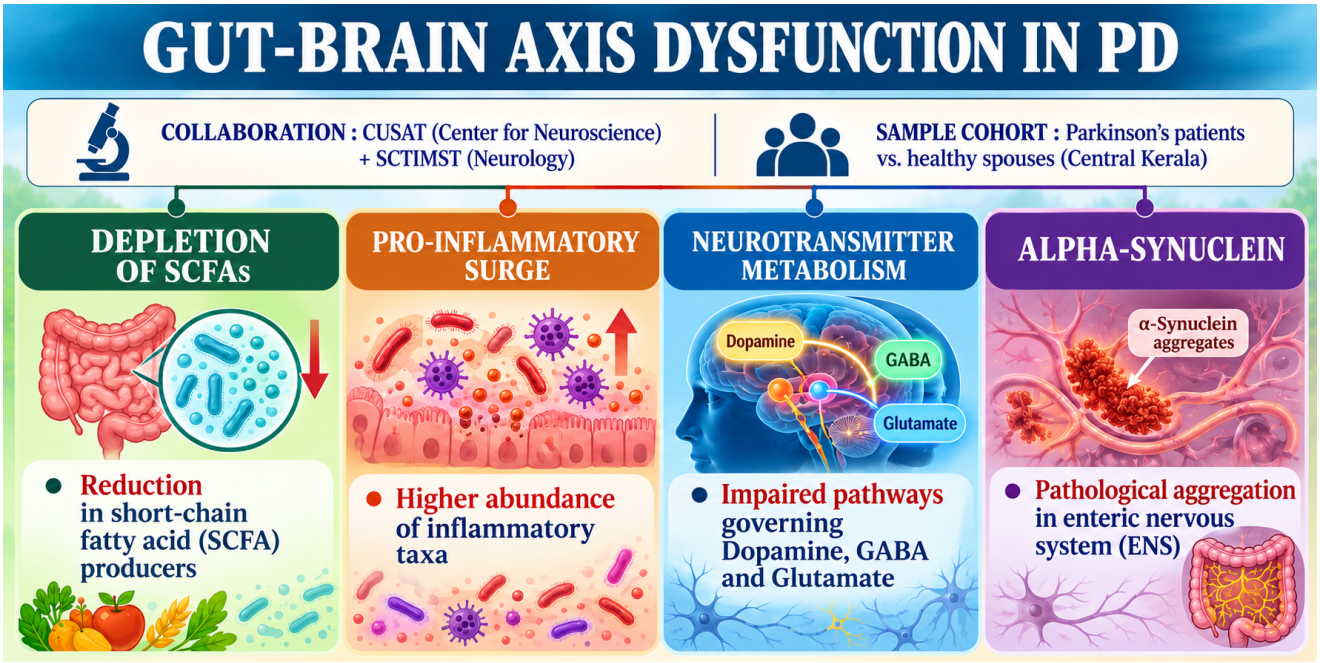
Recently, researchers established a direct correlation between gut microbial dysbiosis and Parkinson's Disease (PD) progression within an Indian population cohort.

Key Findings

Parameter	Experimental Findings
Microbial Dysbiosis Pattern	• **Depletion of Anti-Inflammatory Taxa-** Significant reduction in Short-Chain Fatty Acid (SCFA) producing bacteria (which maintain the gut mucosal barrier and modulate systemic immune response). • **Enrichment of Pro-Inflammatory Bacteria-** Higher relative abundance of inflammatory bacterial strains promoting low-grade systemic inflammation.
Neurotransmitter Pathway Modulation	• Microbial metabolic functional profiling revealed significant alterations in pathways responsible for synthesizing and metabolizing **Dopamine**, **GABA (gamma-aminobutyric acid)**, and **Glutamate** key chemical messengers regulating motor control and neural signaling.
Enteric Nervous System (ENS) Link	• Reinforces the hypothesis that pathological misfolding and aggregation of **α-synuclein protein** may originate in the gut's enteric nervous system prior to propagating to the brain's *substantia nigra* via the **vagus nerve**.

Strategic Significance

- **Validation of the Gut-Brain Axis (GBA) -** Provides localized clinical proof from an Indian regional cohort that neurodegenerative motor disorders are deeply interconnected with gastrointestinal health, dietary profiles, and microbial homeostasis.
- **Non-Invasive Diagnostic Biomarkers -** Identifying gut microbiome signatures enables early, non-invasive biomarker screening for at-risk individuals' years before classical motor symptoms (resting tremors, bradykinesia, muscle rigidity) manifest.
- **Therapeutic Targets -** Paves the way for targeted microbiome interventions such as SCFA supplementation, specific probiotic/prebiotic regimens, or fecal microbiota transplantation.



Reference

[The Hindu | Link between gut bacteria, Parkinson's disease]

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