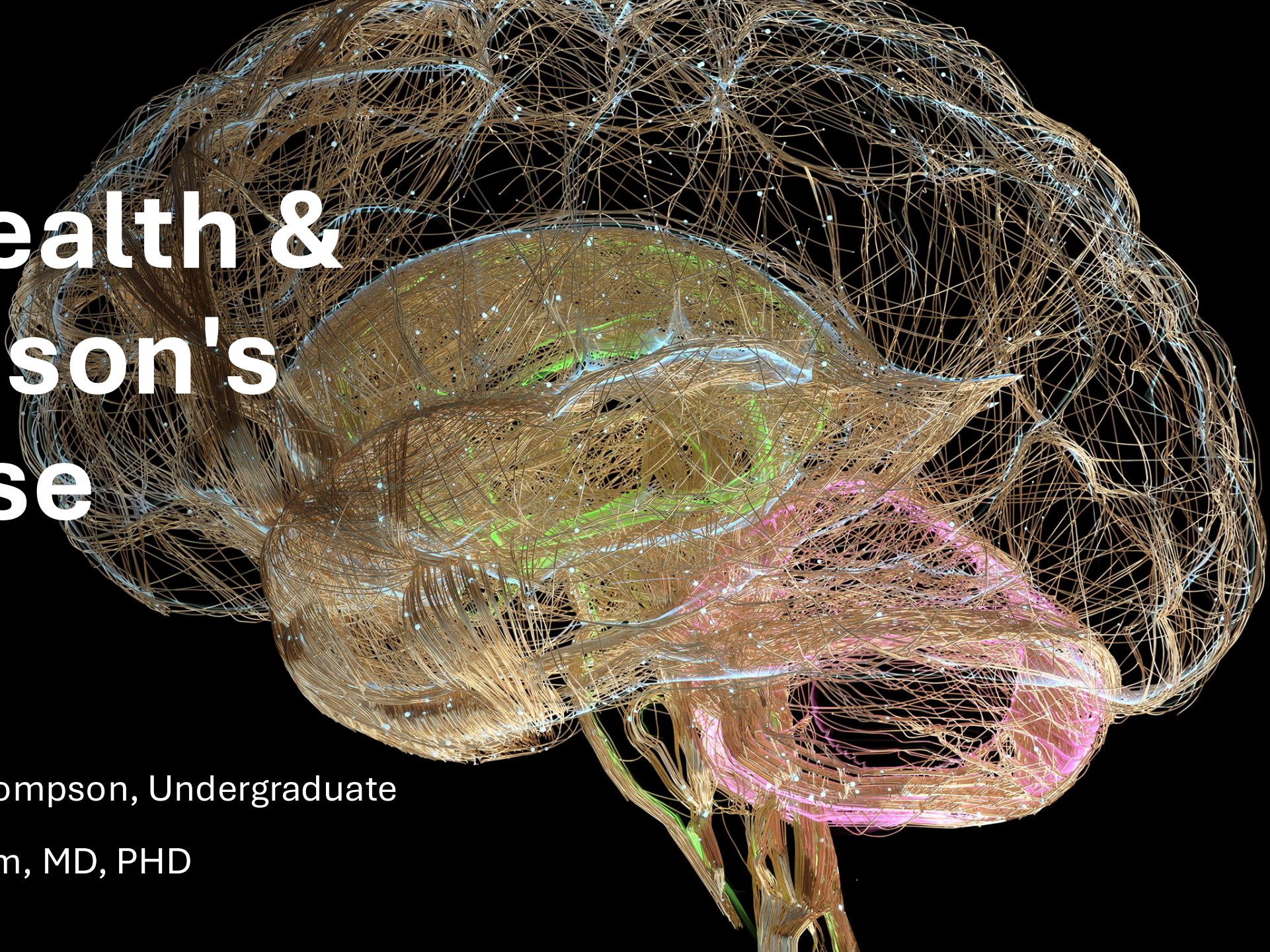


Gut Health & Parkinson's Disease

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What is Parkinson's Disease?

- A neurodegenerative condition that primarily affects movement, causing resting tremors, slow movements, and stiffness.
- Key Characteristics: Dopamine degeneration and the accumulation of α -synuclein.

Parkinson's Disease Symptoms



What are Gut Microbiota?

- A community of microorganisms that live in the stomach.
- A normal balance defends against disease and inflammation.
- **Proteins, fibers, and acids** affect Parkinson's symptoms.

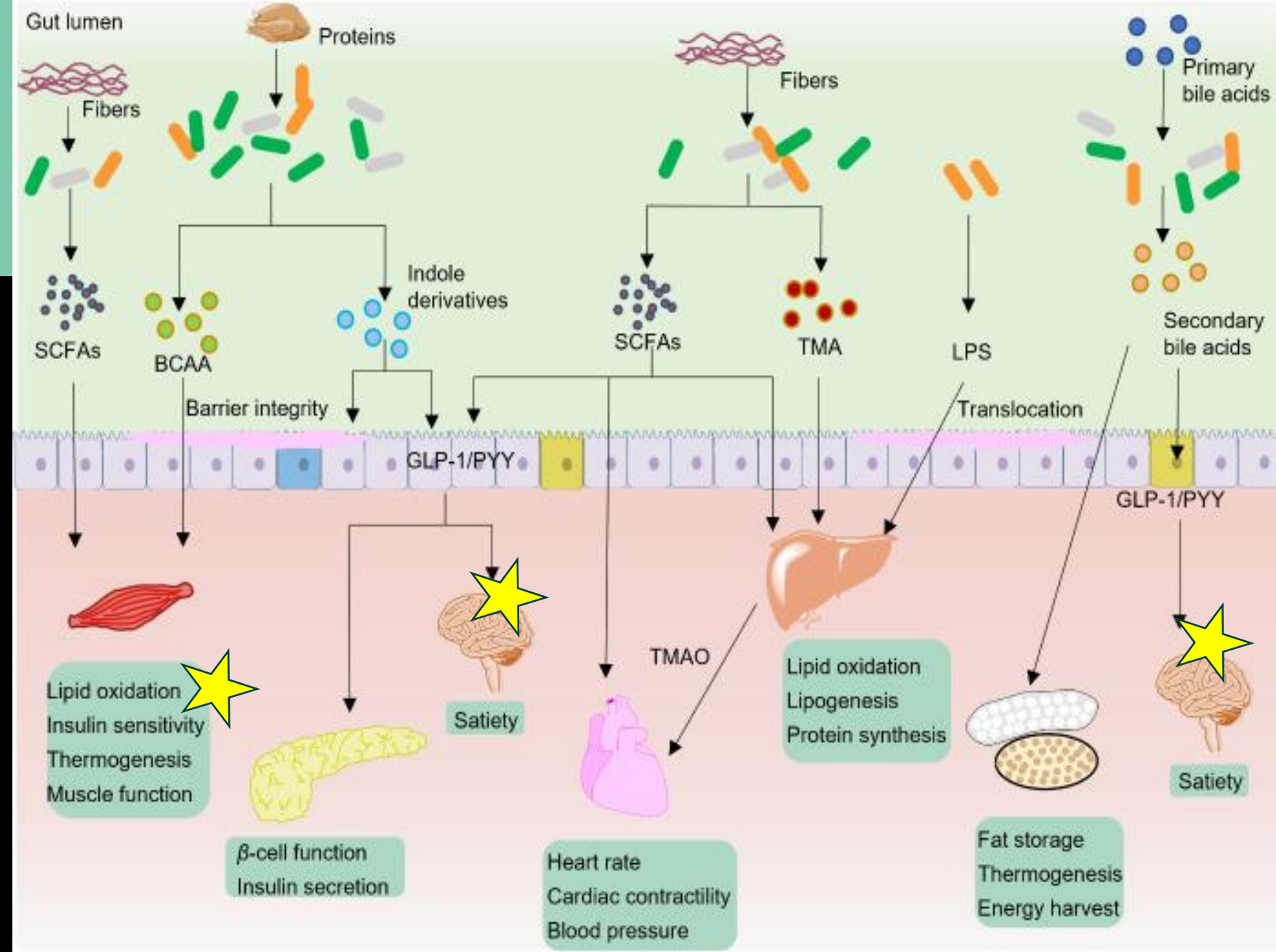


Figure 1. Typical Gut Microbiota (Liu, 2022)

What is the gut brain axis?

- Communication between the brain and gut that involves the nervous and immune system.
- Cells from the gut have a direct synapse to the vagus nerve.

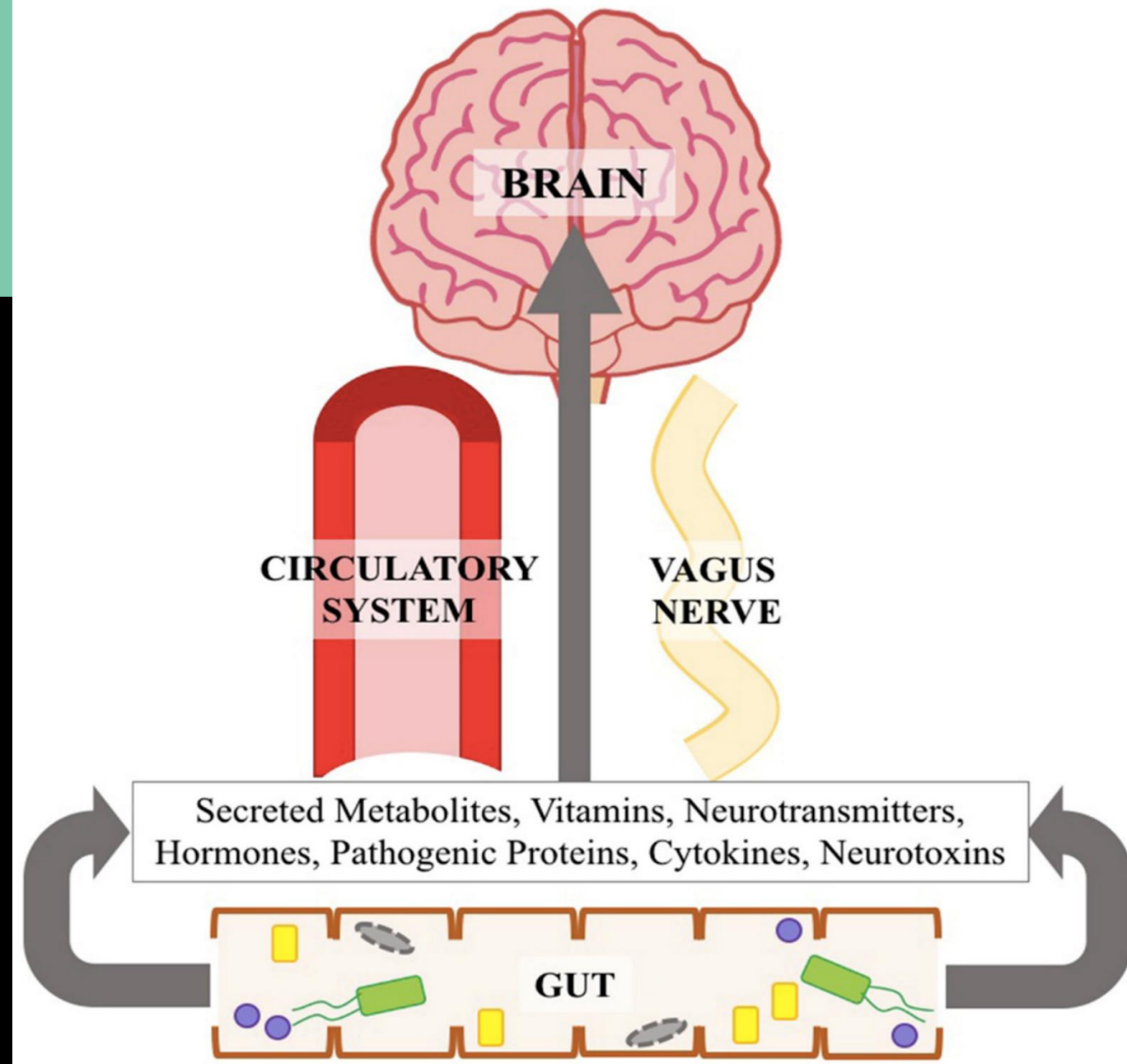


Figure 2. Communication between the gut microbiota and the brain
(Gazerani 2019)

The Gut and Parkinson's

- Imbalance increases accumulation of α -synuclein, inflammation, and decreases immune function. (Hirayama, 2021)
- Inflammation can also promote disruption of the Blood Brain Barrier (BBB) facilitating dopamine loss. (Gazerani, 2019)

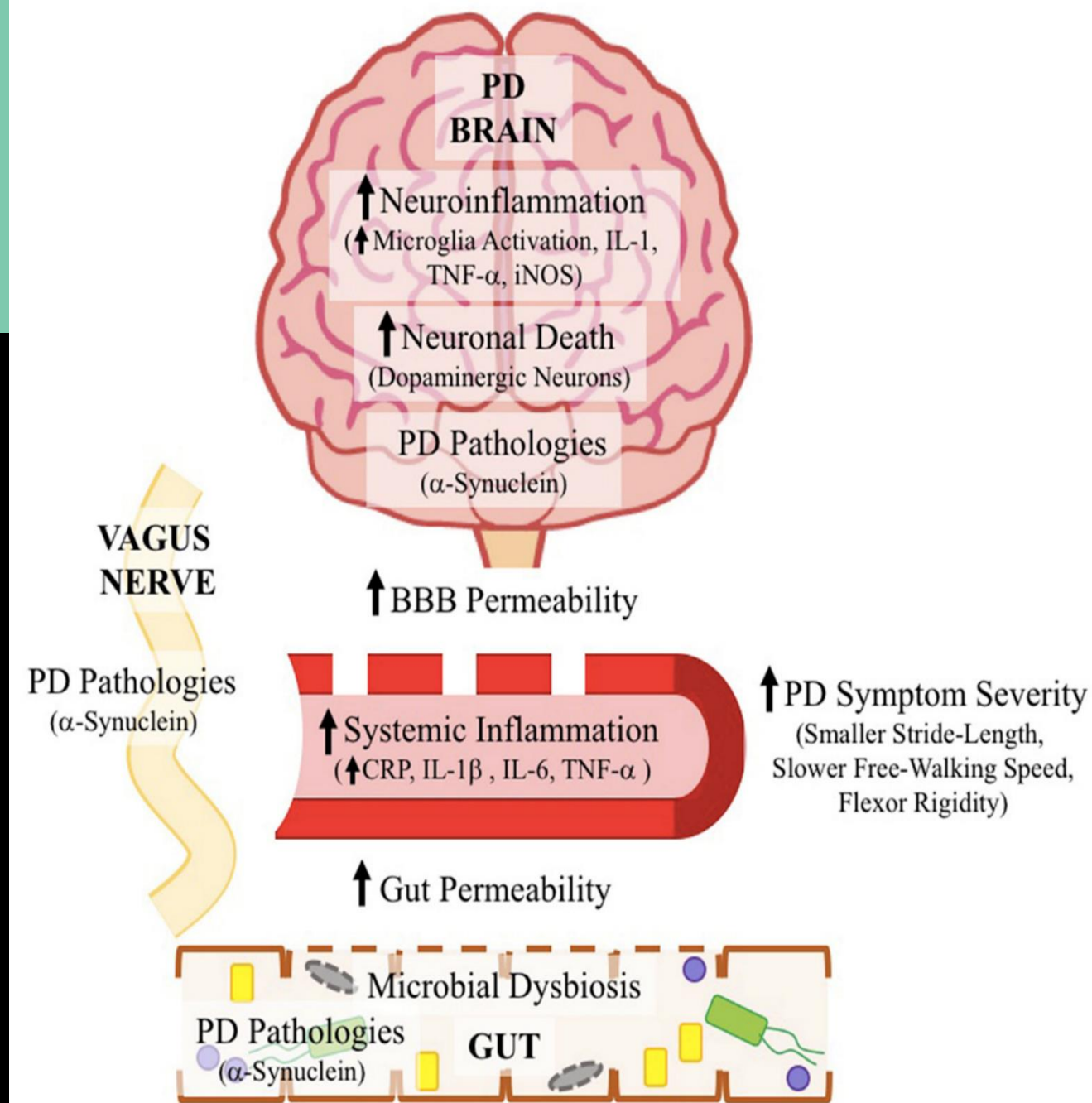


Figure 3: The role of gut microbiota in Parkinson's disease (Gazerani, 2019)

Potential Therapeutic Interventions for Parkinson's Disease

- **Probiotics and Prebiotics**
 - Restore microbiota, maintain immune functioning, and protect gut barrier disruption.
- **Fecal Microbiota Transplant (FMT)**
 - Gut microbiota from a healthy donor is delivered to a patient's Gastrointestinal tract.
- **Diet and Lifestyle**
 - More fiber intake, anti-inflammatory foods, aerobic exercise.
- **Unresolved Questions**
 - Causality vs. Correlation
 - Individual differences in microbiome response.



Cultural Exchange

- **Ece** Turkey
 - Learn to thrive in discomfort and be resilient.
- **Nathan** Uganda
 - Has many languages and dialects.
- **Lizbeth** Mexico
 - Her pueblito celebrates their saint for 2 weeks by throwing parties and having fireworks.



- A sincere thank you to Dr. Bayram for teaching us about not only Parkinson's and Lewy body Dementia but also about how it effects real people.
- I am also deeply grateful to Dr. Cristina Cenciarelli and Elizabeth Evans for fostering this program and for accepting me to be a part of it.

