CEDAR VALLEY
Digestive Health Center

RUSH

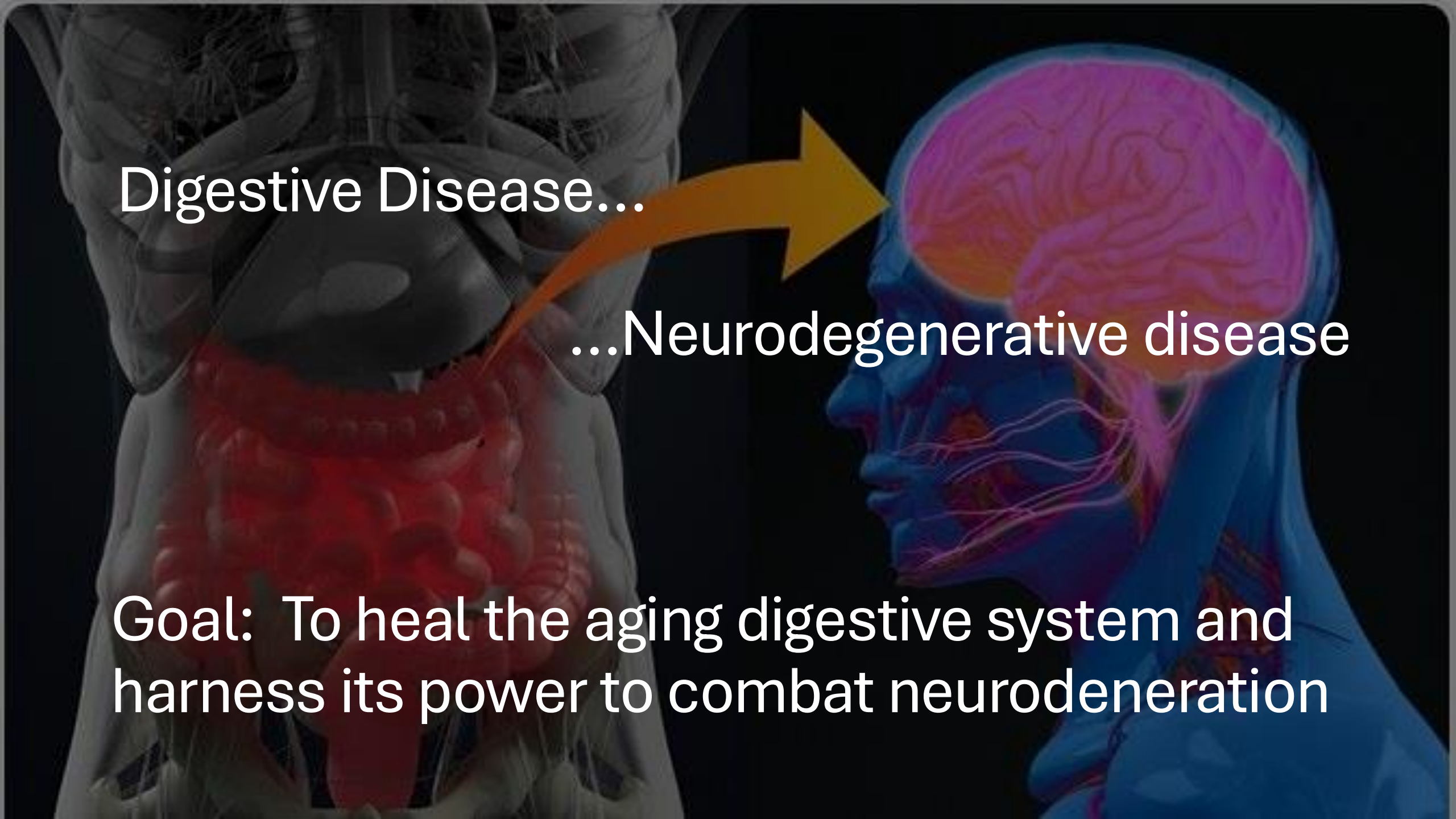
Gut-Brain Connection in Parkinson's Disease

Richard A. Manfready, MD, AM, FACP
Gastroenterology and Hepatology
Director, ANMS Motility Center
Cedar Valley Digestive Health

Assistant Professor of Medicine, Adj.
Center for Integrated Microbiome and Chronobiology
Rush University Medical Center

Disclosures

None


Digestive Disease…
…Neurodegenerative disease
Goal: To heal the aging digestive system and harness its power to combat neurodeneration

Digestive disorders in Parkinson’s disease

Almost 75% suffer

Underrecognized; many are undiagnosed

Makaroff, et al. (2011)

Common digestive issues in Parkinson's disease

Dysphagia (difficulty swallowing)

Gastroparesis (slow stomach emptying)

Malabsorption

Small intestinal bacterial overgrowth

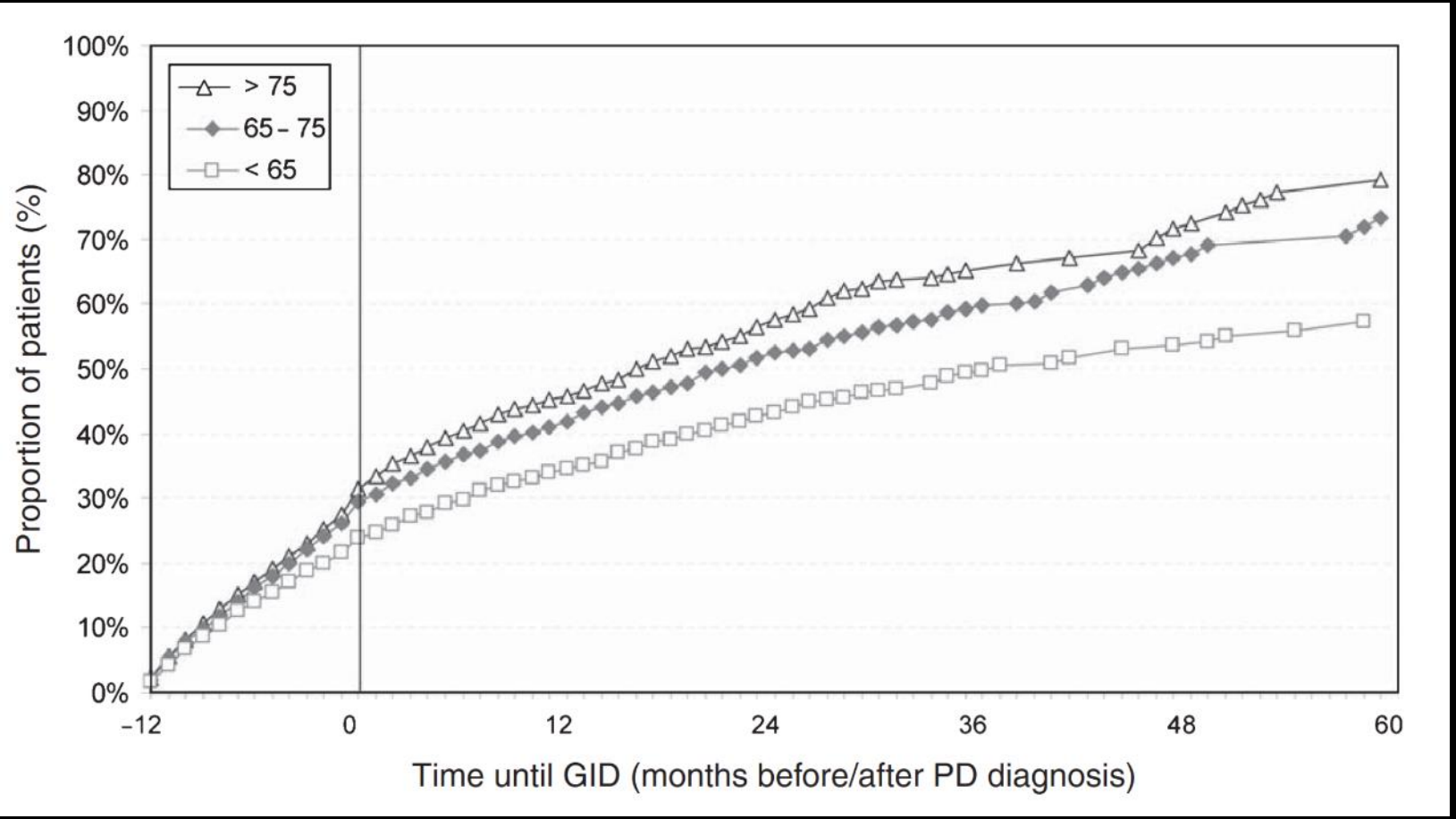
Constipation

Rectal evacuation disorders

Abdominal pain

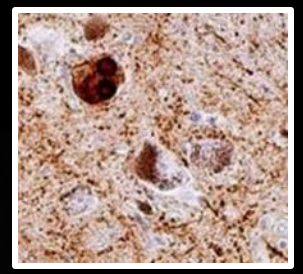
Weight loss

Gastrointestinal dysfunction (GID) in PD

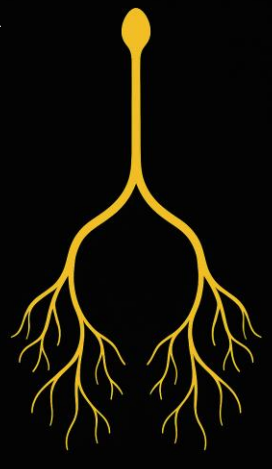


Makaroff, et al. (2011)

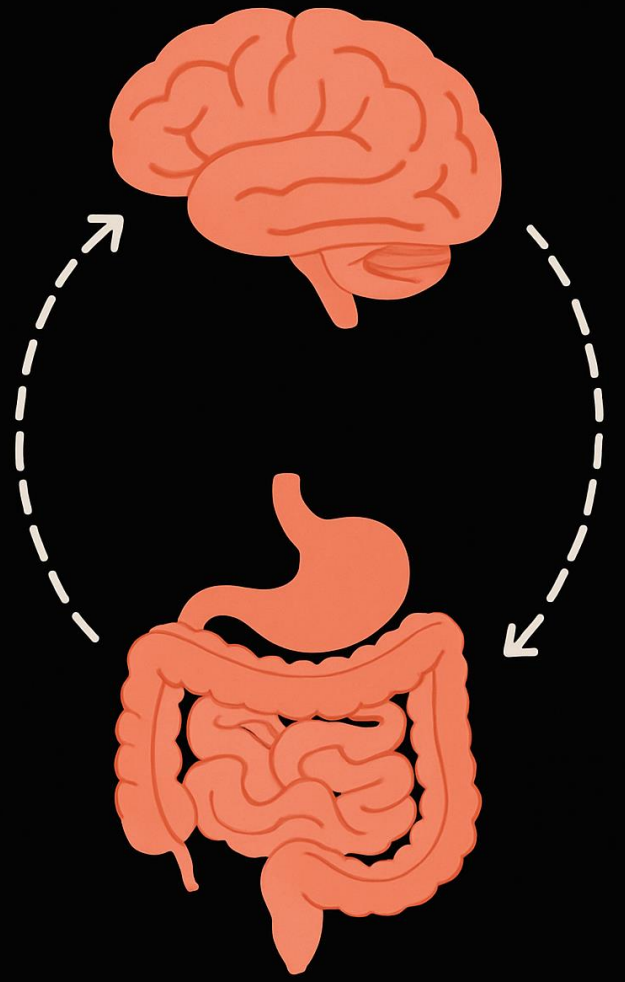
α-synuclein in the brain



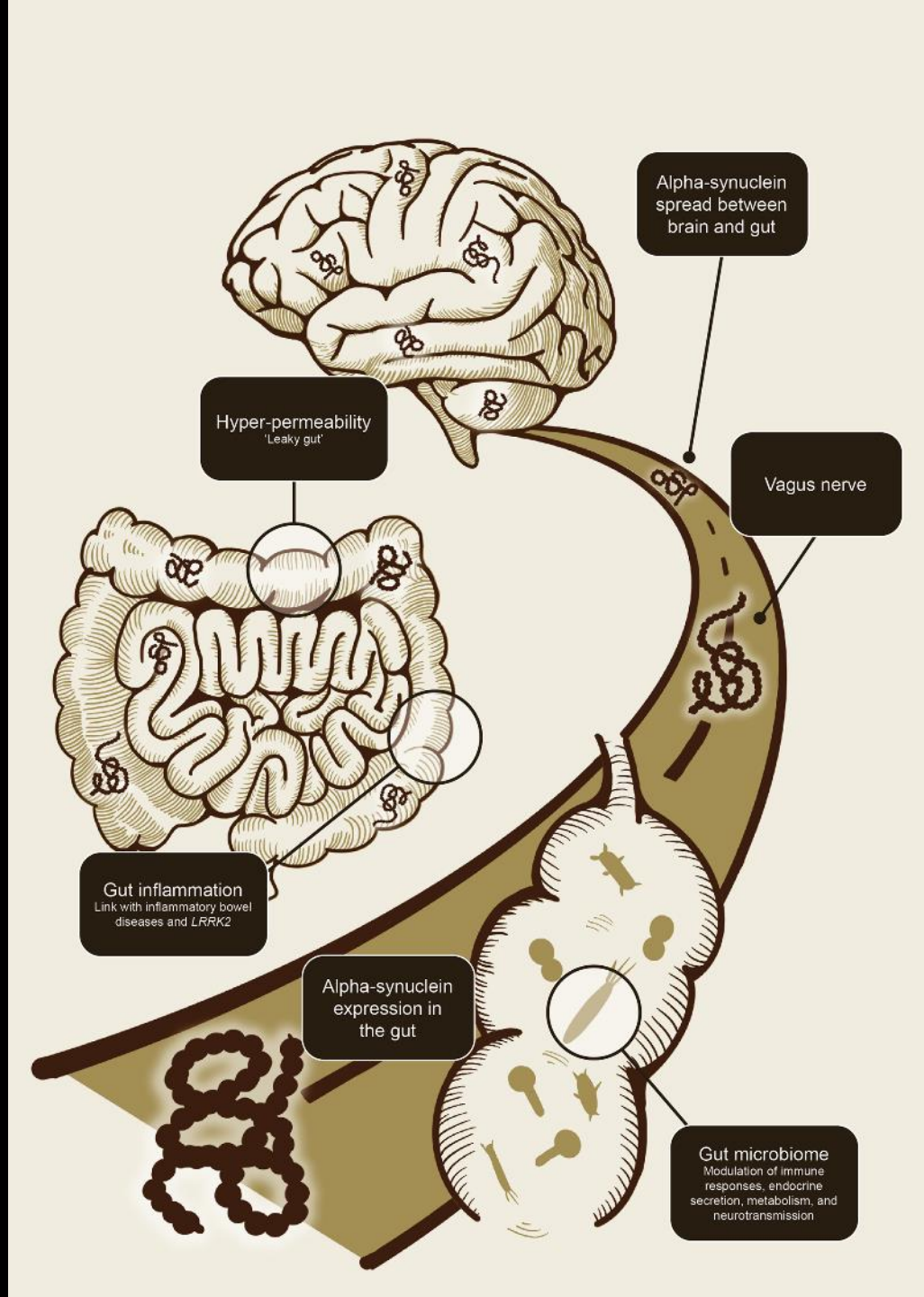
Vagus nerve



α-synuclein in the colon



Braak, et al. (2003)
Mensikova, et al. (2022)
Visanji, et al. (2015)



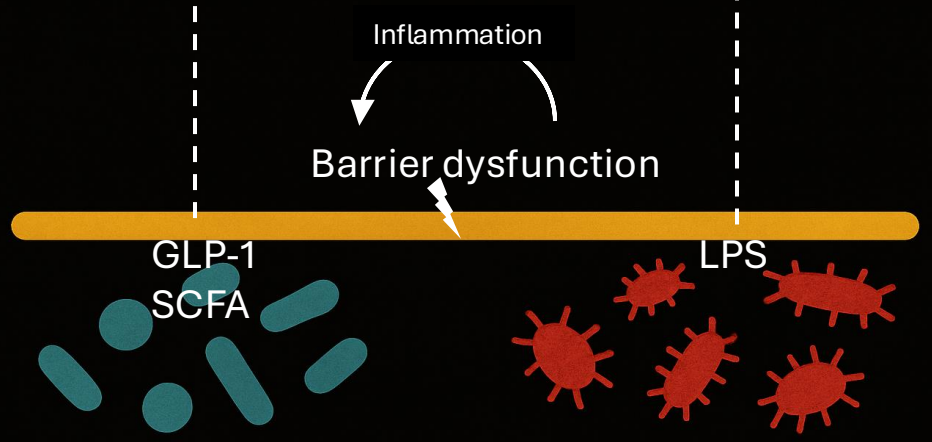
Shin-Yang, et al. (2021)

Healthy

- Neuroprotection
- Low systemic inflammation

Unhealthy

- Neurodegeneration (microglial activation)
- α-synuclein aggregation
- High systemic inflammation

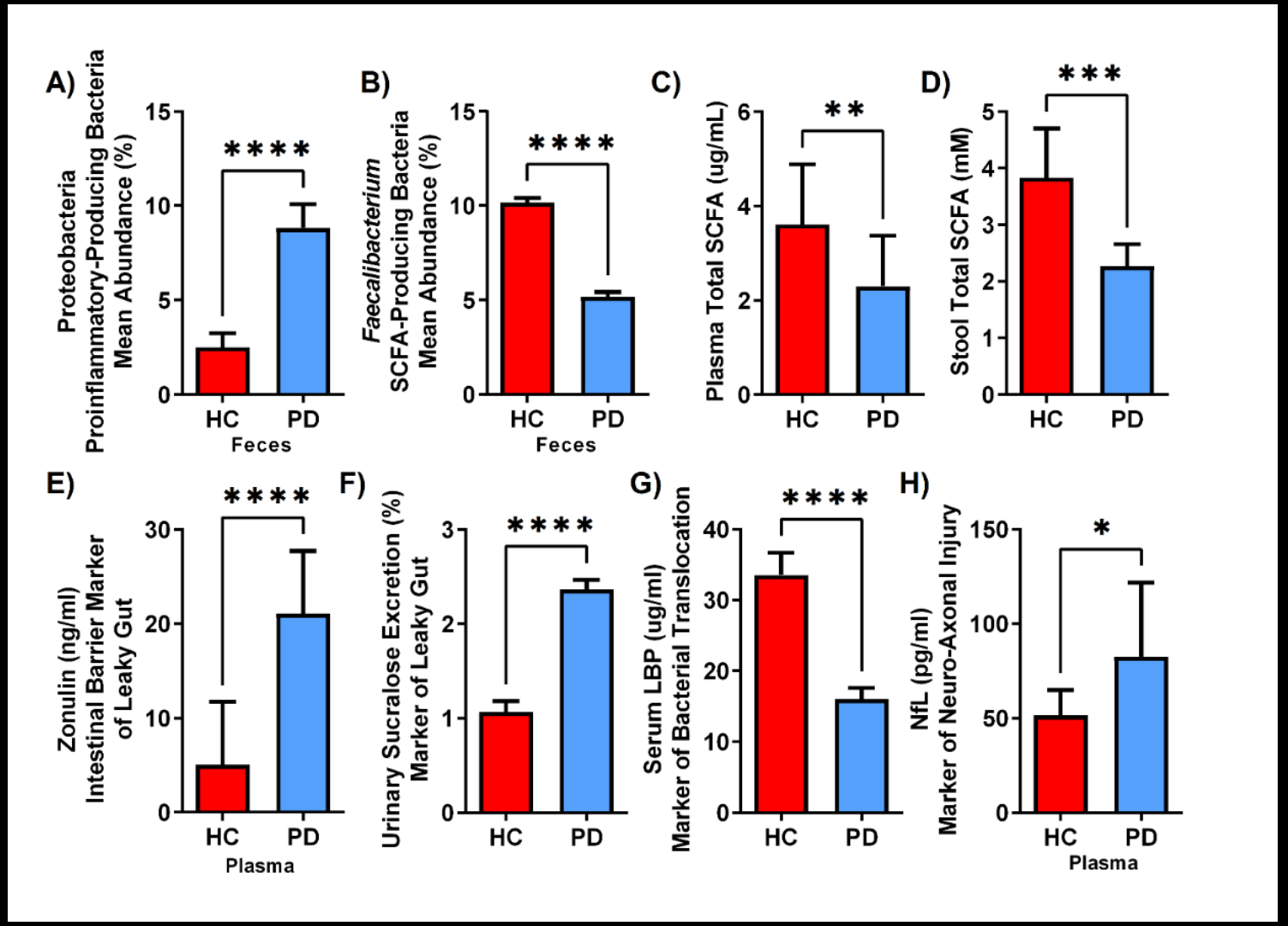


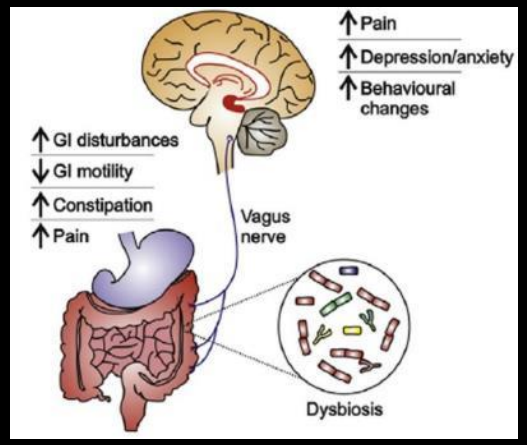
- Fiber/Mediterranean diet
- Physical activity

- Fat/Western-style diet
- Antibiotics
- Pesticides

Manfready, et al. (2023)

Gut microbiota changes in PD





Keshavarzian, et al. (2015)

Diet

Environment

Genetics

Altered gut microbiota

Inflammation

Diminished gut barrier function

Reduced neural protection by healthy bacteria

Neurodegeneration

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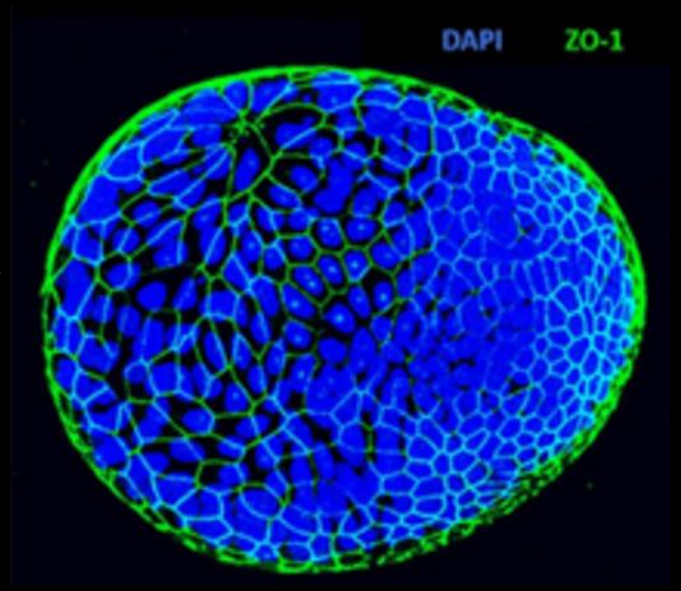

Neurodegeneration

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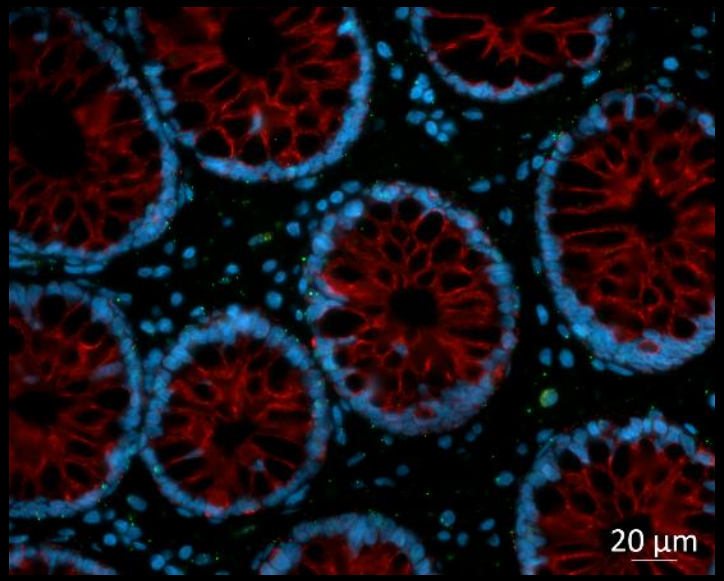
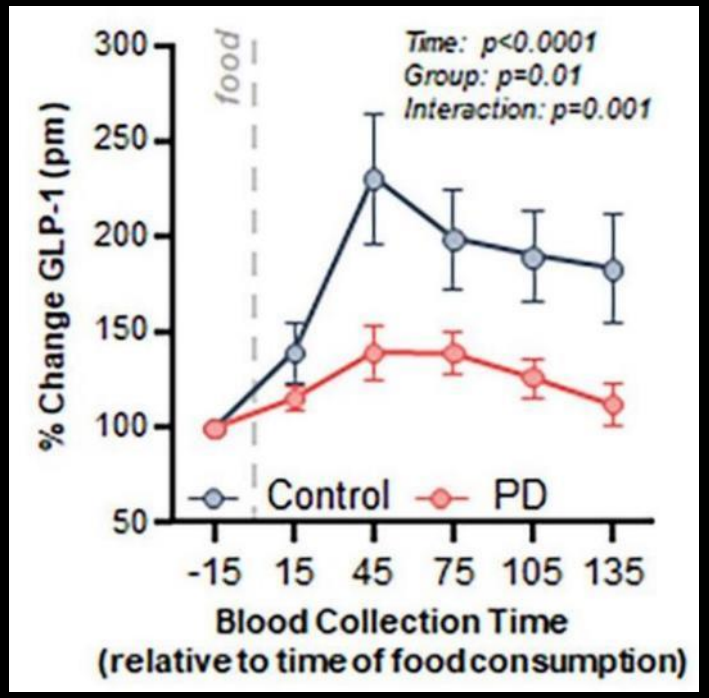
Neurodegeneration





Manfready, et al. (2021)

Diet

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Altered gut microbiota

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Neurodegeneration

Environmental toxins:

- Manganese
- Pesticides
  - Maneb
  - Paraquat
  - Rotinone
- Trichloroethylene
- PCB's and particulate matter

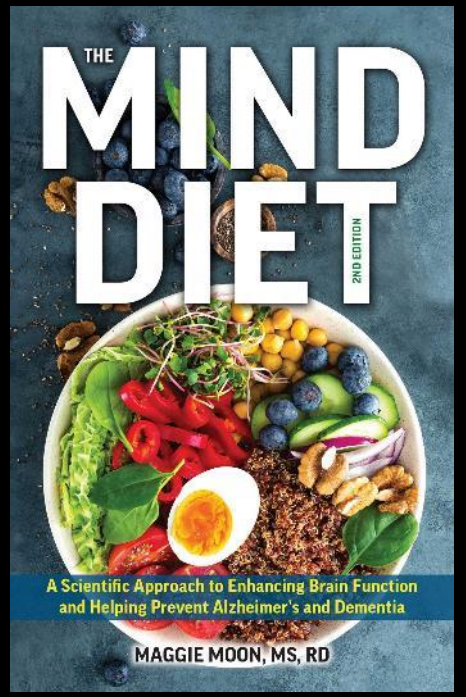
Diet

Goal: To fuel the body's 'healthy' microbiota while preventing growth of pro-inflammatory bacteria.

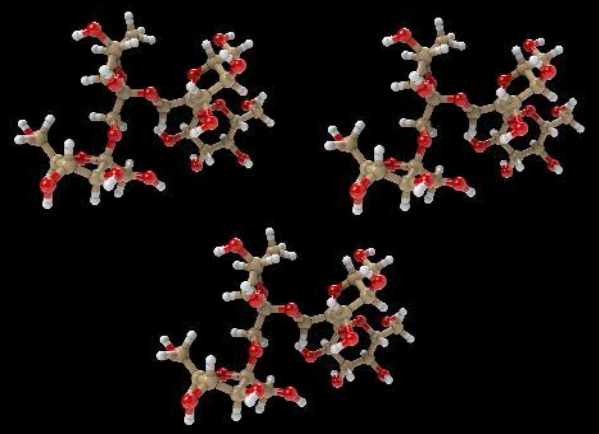
- Green leafy vegetables
- Fruits
- Whole grains
- Legumes
- Nuts
- Lean meats (chicken, fish)
- Olive oil

Mediterranean Diet

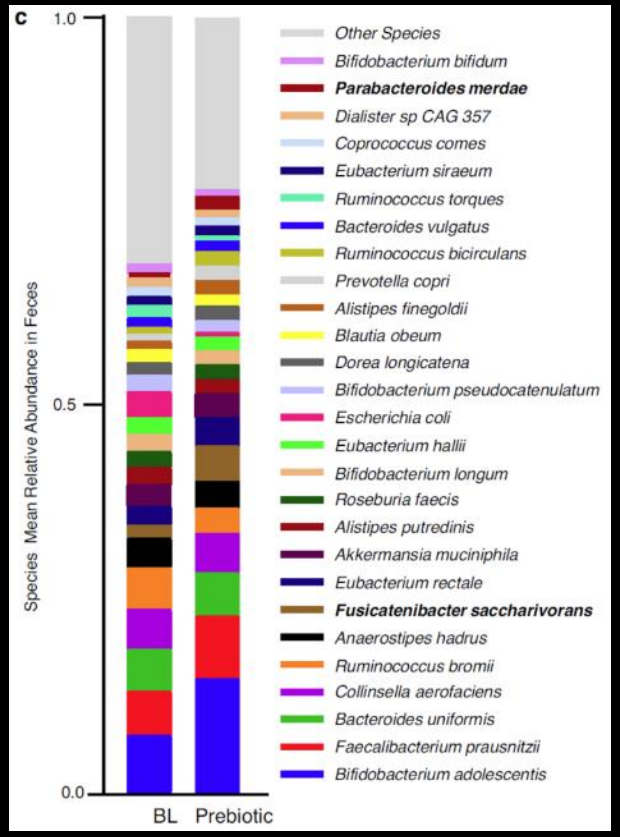
MIND Diet



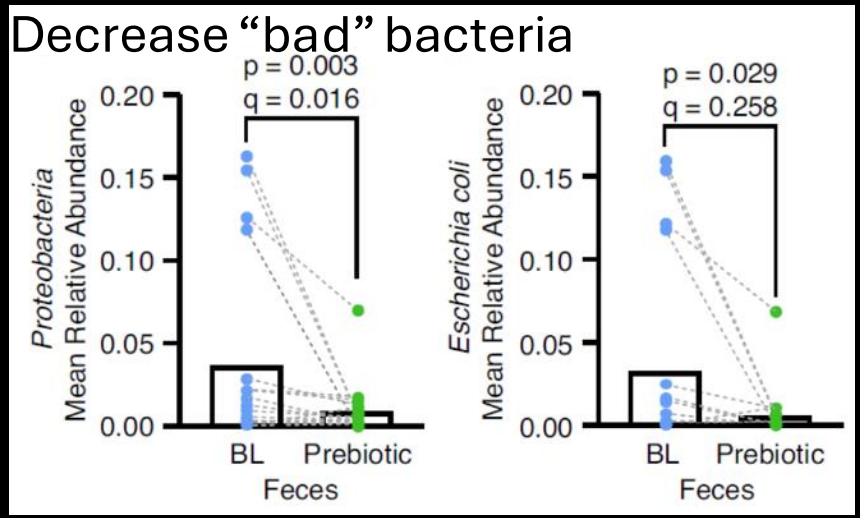
A targeted approach for Parkinson's patients



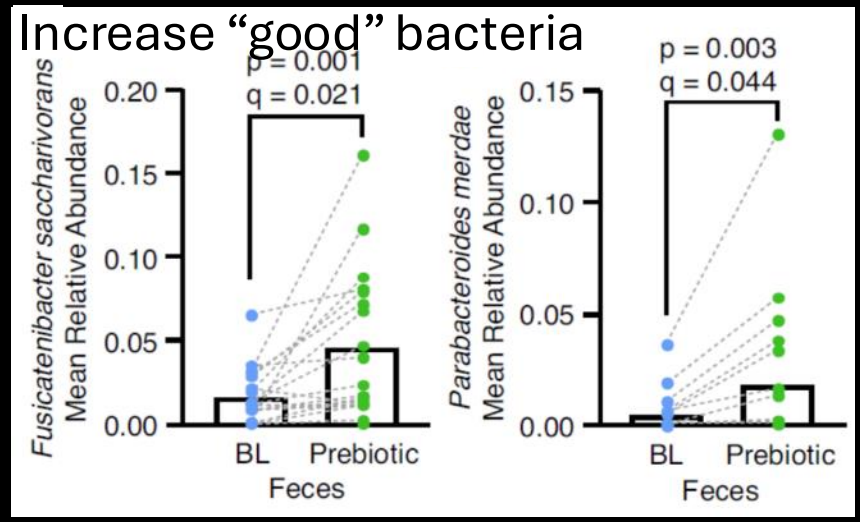
Custom-designed prebiotic fibers



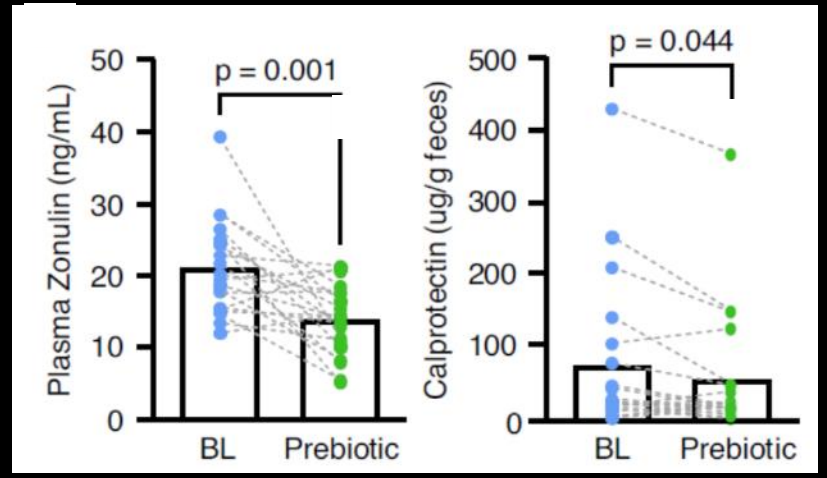
Decrease "bad" bacteria



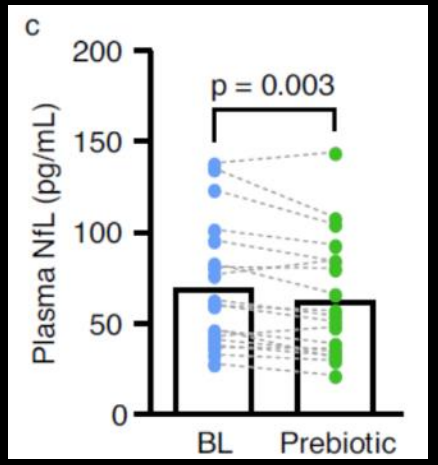
Increase "good" bacteria



Decrease gut inflammation



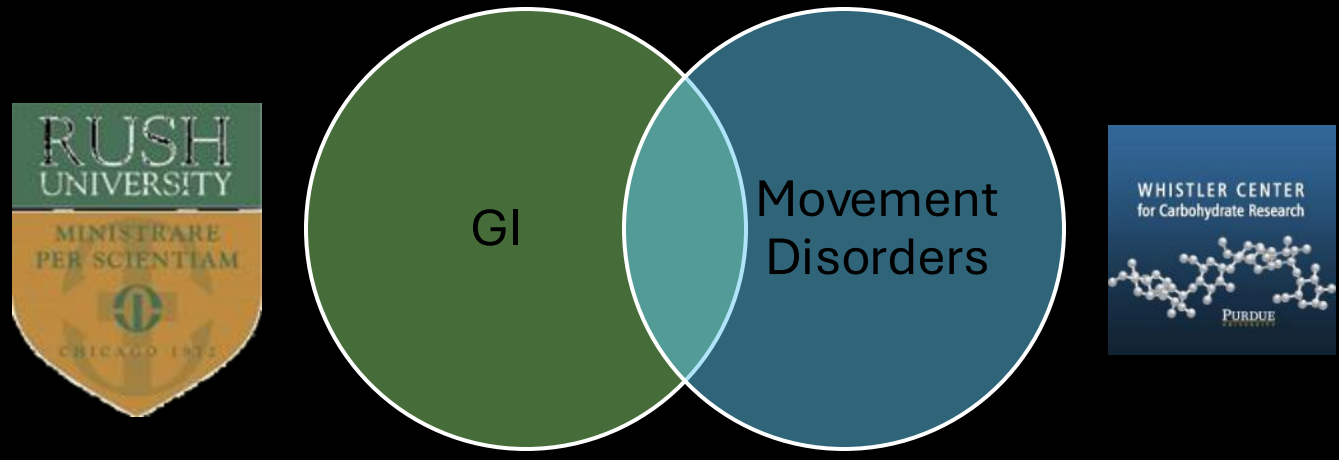
Protect neurons



Dietary strategies tend to **work better for early-stage Parkinson's.**

It is more difficult to restore gut-brain function once there is substantial brain involvement in advanced disease.

Experience from PD-GI Clinic



Constipation and bloating are major hurdles to dietary tolerance in advanced disease.

PD Constipation

α-synuclein accumulation

Inflammation

Gut barrier dysfunction

Impaired intestinal motility

Pelvic floor dyssynergia

PD Constipation

α-synuclein accumulation

Inflammation

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Distinct entity from IBS

5 or fewer spontaneous bowel movements (not aided by medications) a week with **lack of complete evacuation**.

PD Constipation

α-synuclein accumulation

Inflammation

Gut barrier dysfunction

Impaired intestinal motility

Pelvic floor dyssynergia

- Diet
- Exercise
- Special laxatives to reduce gut-brain inflammation

CLINICAL TRIALS ONGOING

PD Constipation

α-synuclein accumulation

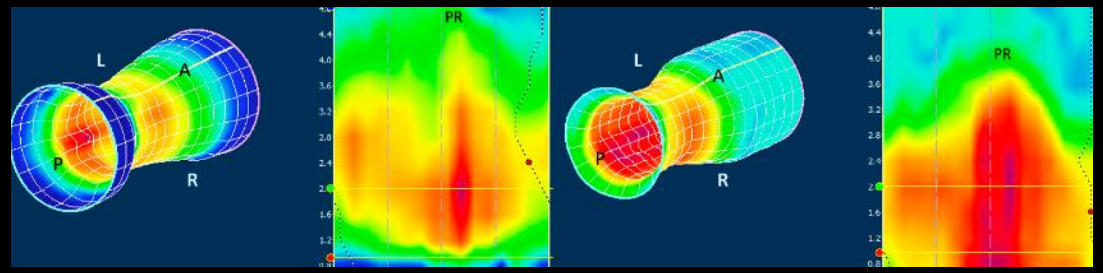
Inflammation

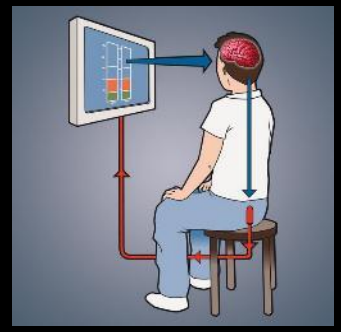
Gut barrier dysfunction

Impaired intestinal motility

Pelvic floor dyssynergia

- Anorectal manometry → Biofeedback therapy



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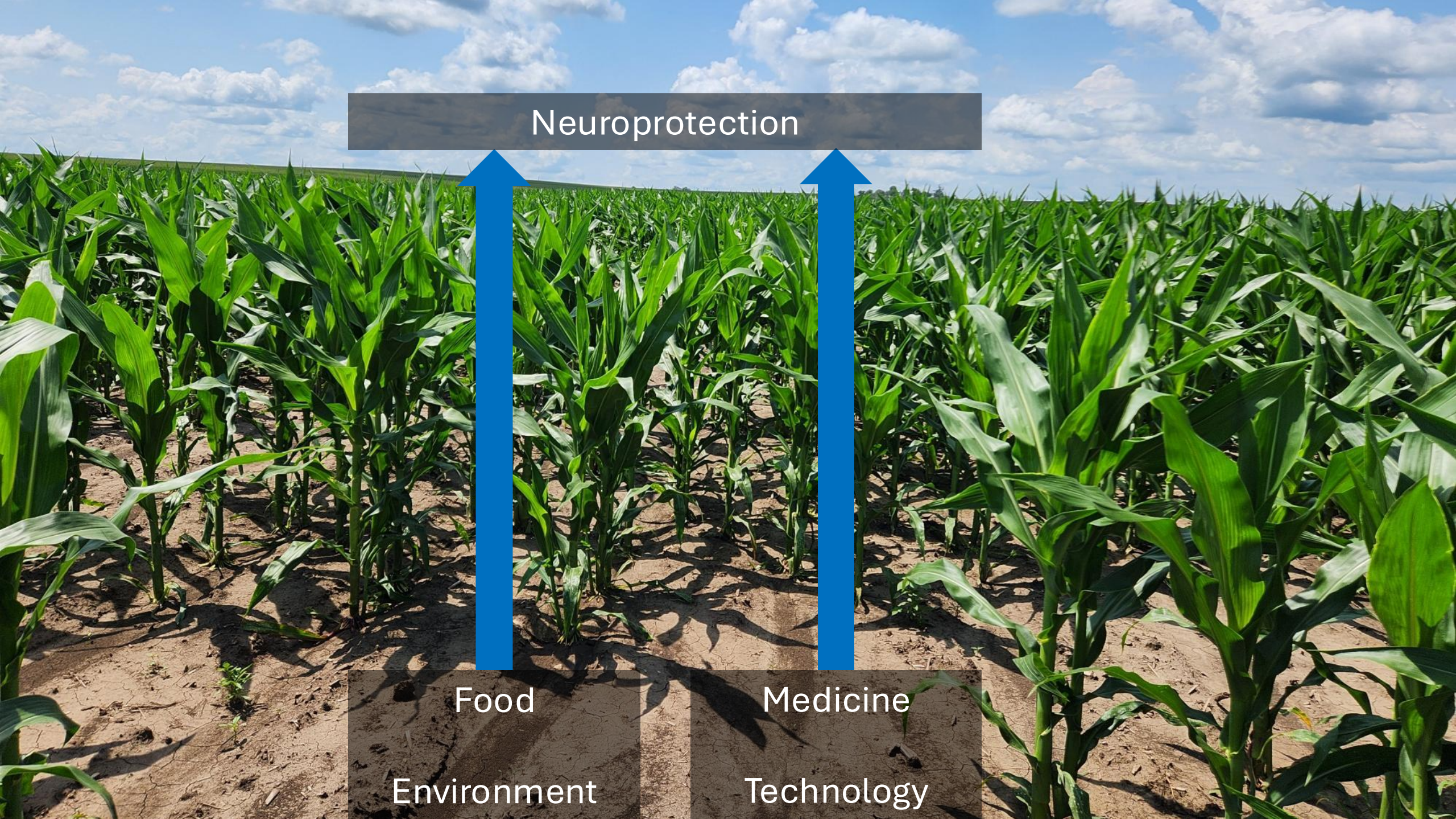
Neuroprotection
Food
Environment
Medicine
Technology

Thank you!

DHC Group:
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Zlata Bogin, MS

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Purdue Lab:
Bruce Hamaker, PhD
Thaisa Cantu-Jungles, PhD

To learn more about our Parkinson's trials or participate:

Email: hpunukula@cvmspc.com

To schedule a Parkinson's Digestive Health consultation:

Call: (319) 234-5990 (Dr. Manfready clinic)

Waterloo, IA location

Questions?