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Naturally Informed's
Microbiome: Mastering the Market
May 17-19, 2022

Gut-Brain Axis: New Paradigms in Nutraceuticals

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May 17, 2022, 12:40 to 1:10 pm ET

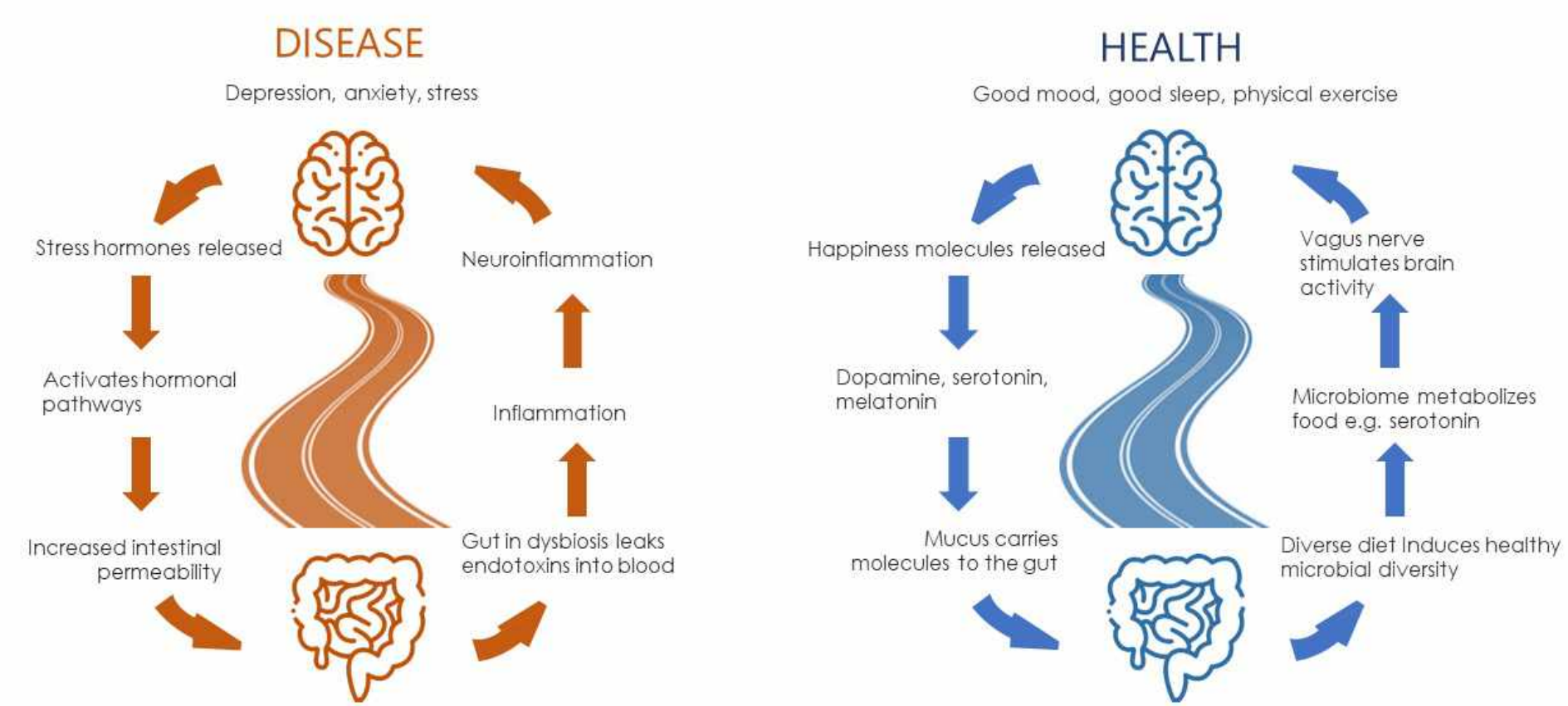
Disclosures

- **Co-founder and Scientific Research Officer of *Postbiotics Inc.***
- **Consultant of *MusB LLC***

Some Fun Facts About our Gut and Brain Interactions

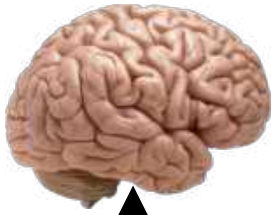
- We are more microbial than human, because our body have 10 times more microbial cells and than human cells
- We carry ~2kg as microbial mass in our body weight
- Our human genome express 23,000-24,000 genes, while microbiome express >300,000 genes
- Gut has as many neurons as our brain has.
- Gut makes 90% serotonin and 50% dopamine.
- Microbiome also produce neurotransmitters, GABA, Glutamine.

Gut and brain axis involves physical and humoral connections in diseases and health

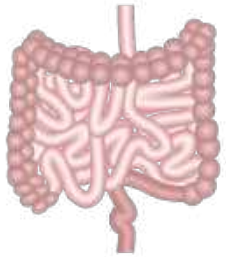


https://lifetimeomics.com/the-omics-gut-brain-axis-2/

Microbiome in obesity though Gut-Brain communications



Gut brain axis



Food Intake cycle

Foggy brain after eating

Precision effects

Happy after eating

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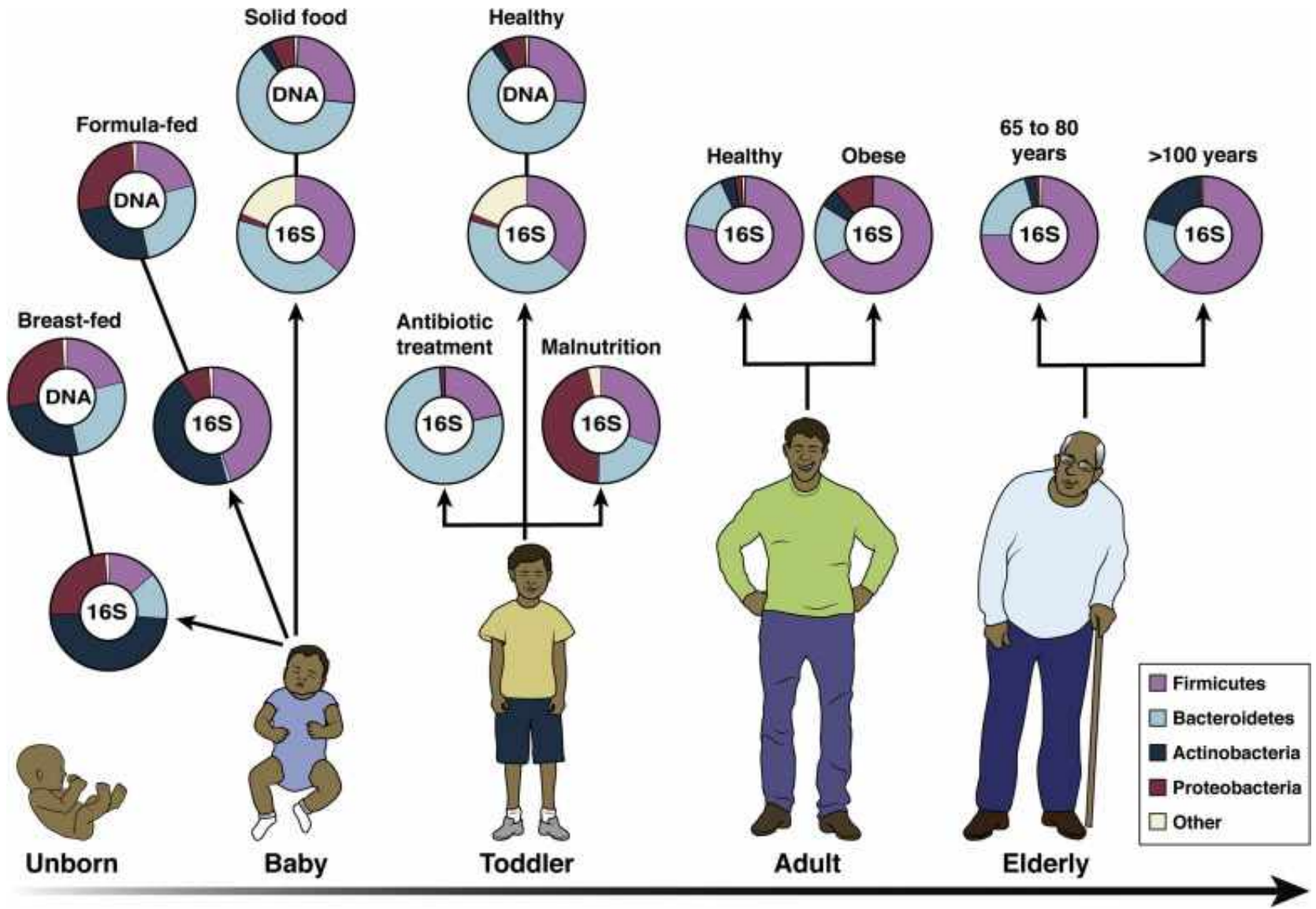
Microbiome composition is dynamic throughout the life and changes with age



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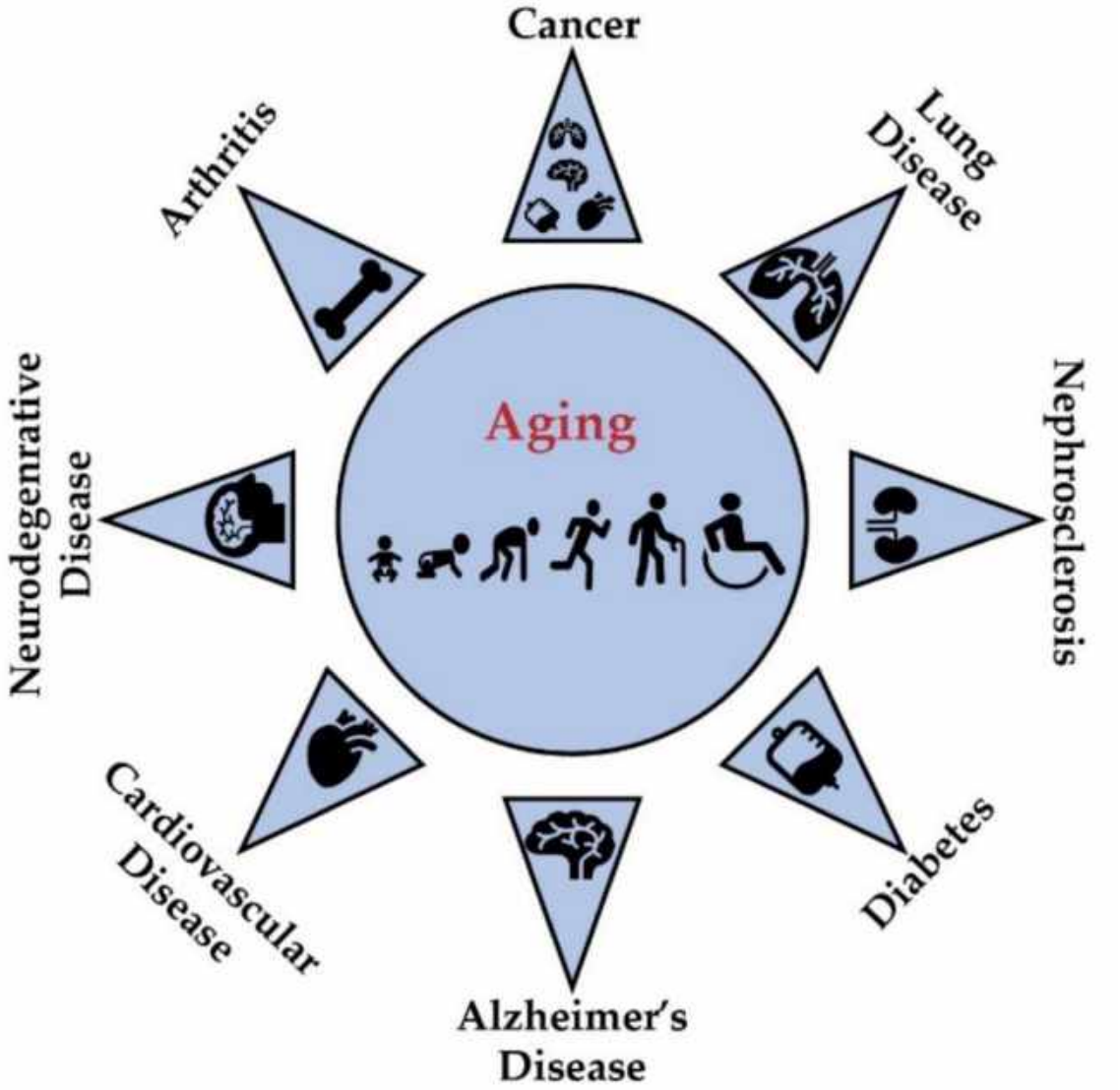
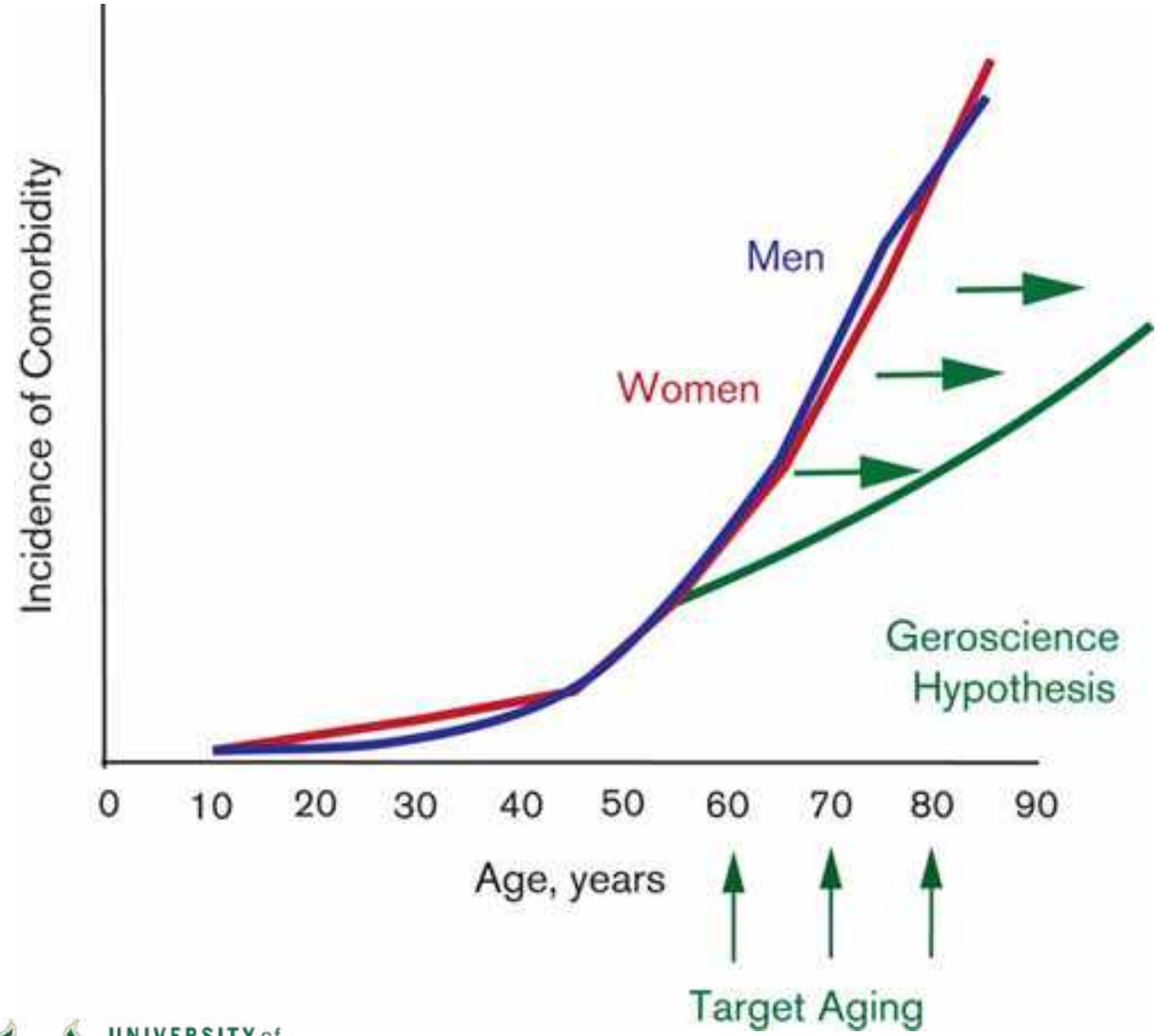
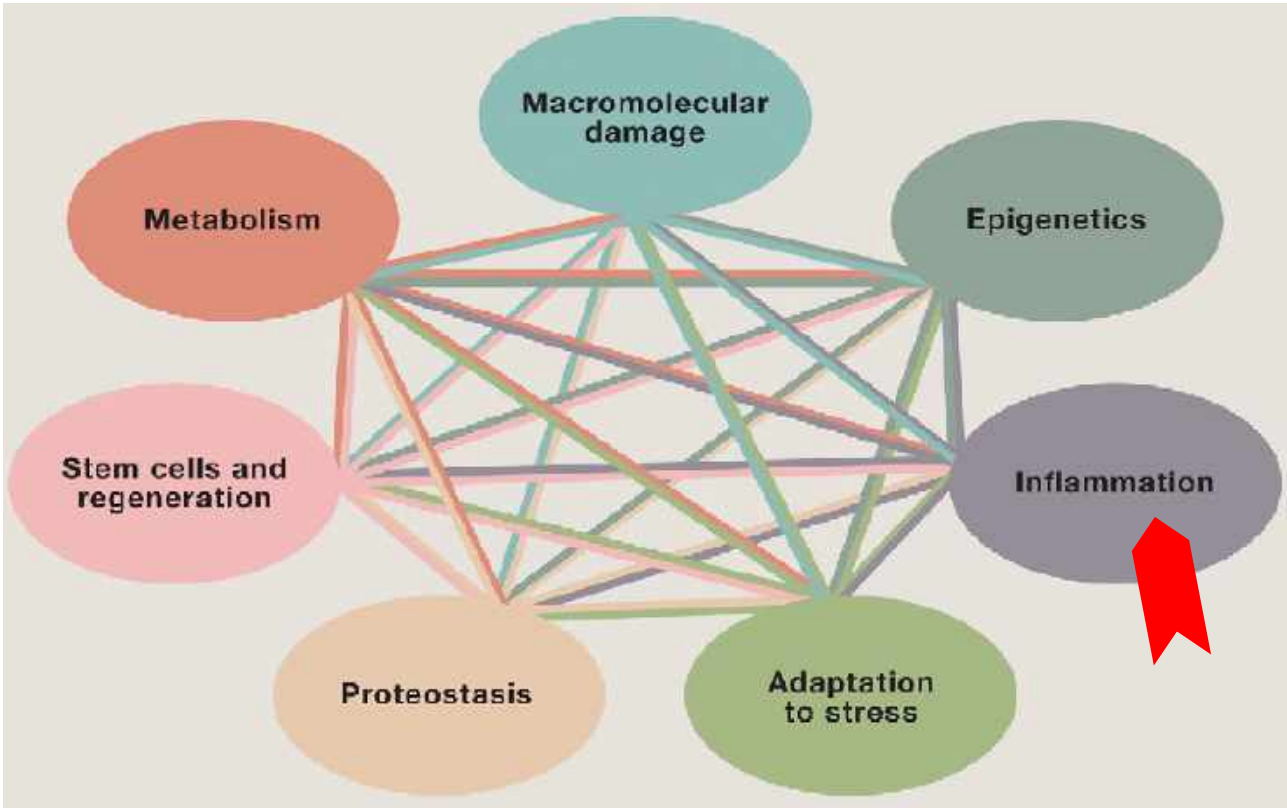
Aging-related disorders



- Aging is not a disease, so no chance of FDA approval
- However, it is a key risk factor of several chronic diseases
- But how remains largely unknown

Geroscience hypothesis is allowing to design therapies for aging





Geroscience Hypothesis

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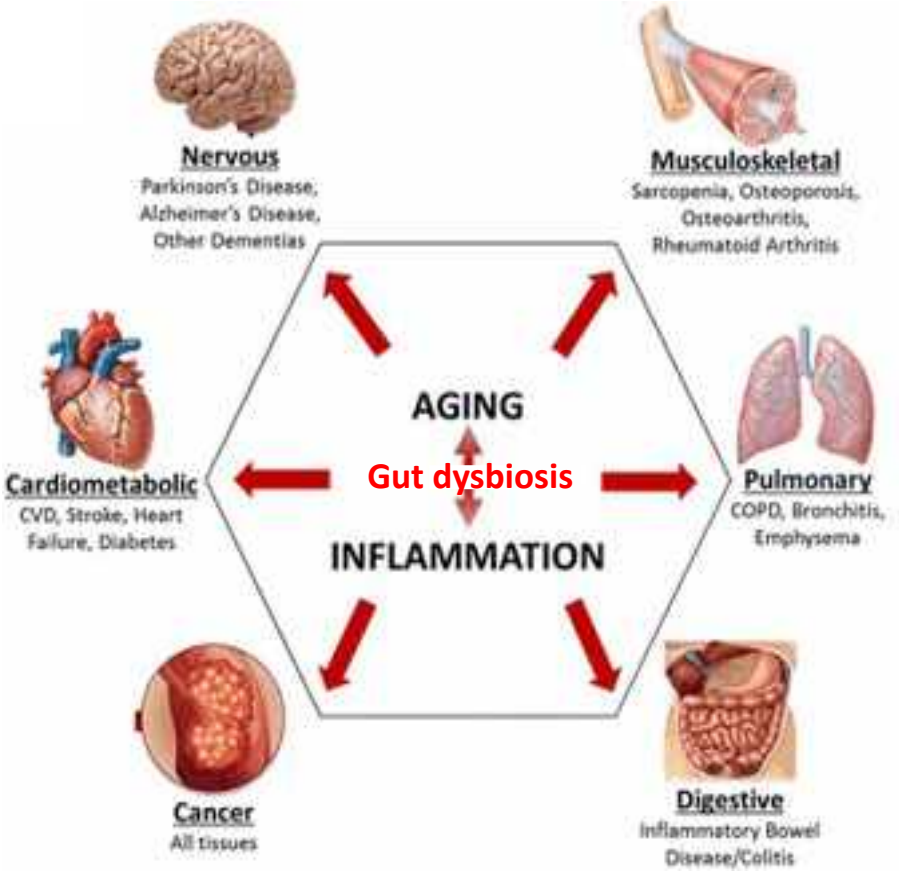
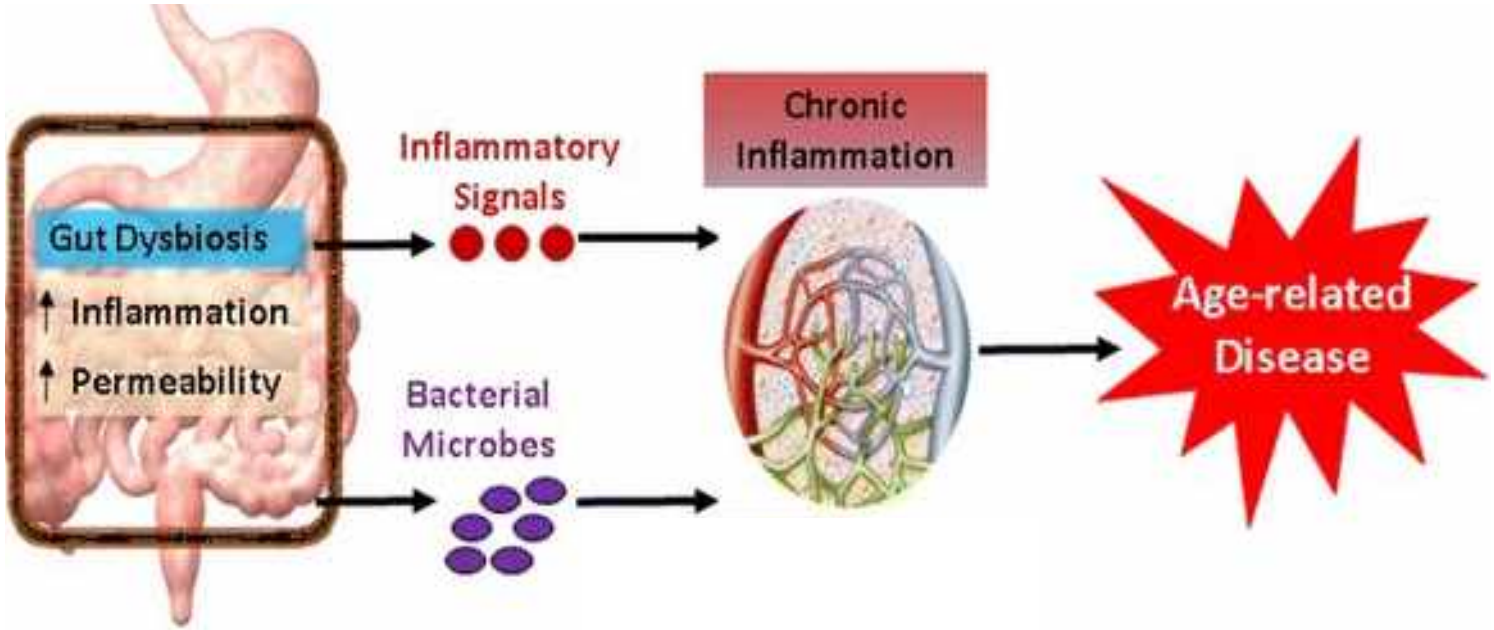
Inflammaging and gut microbiome





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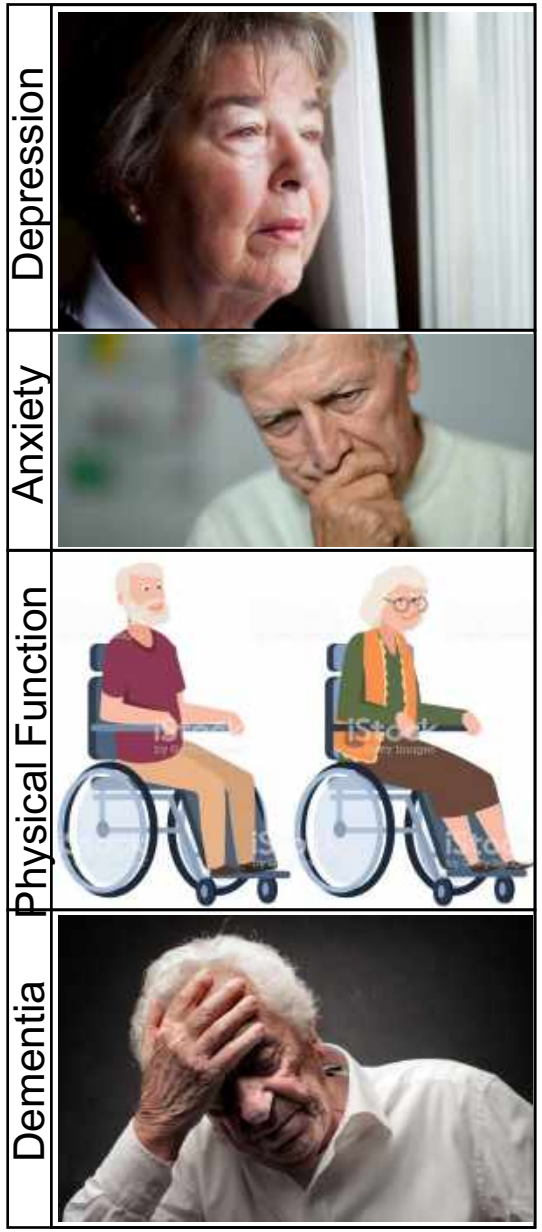
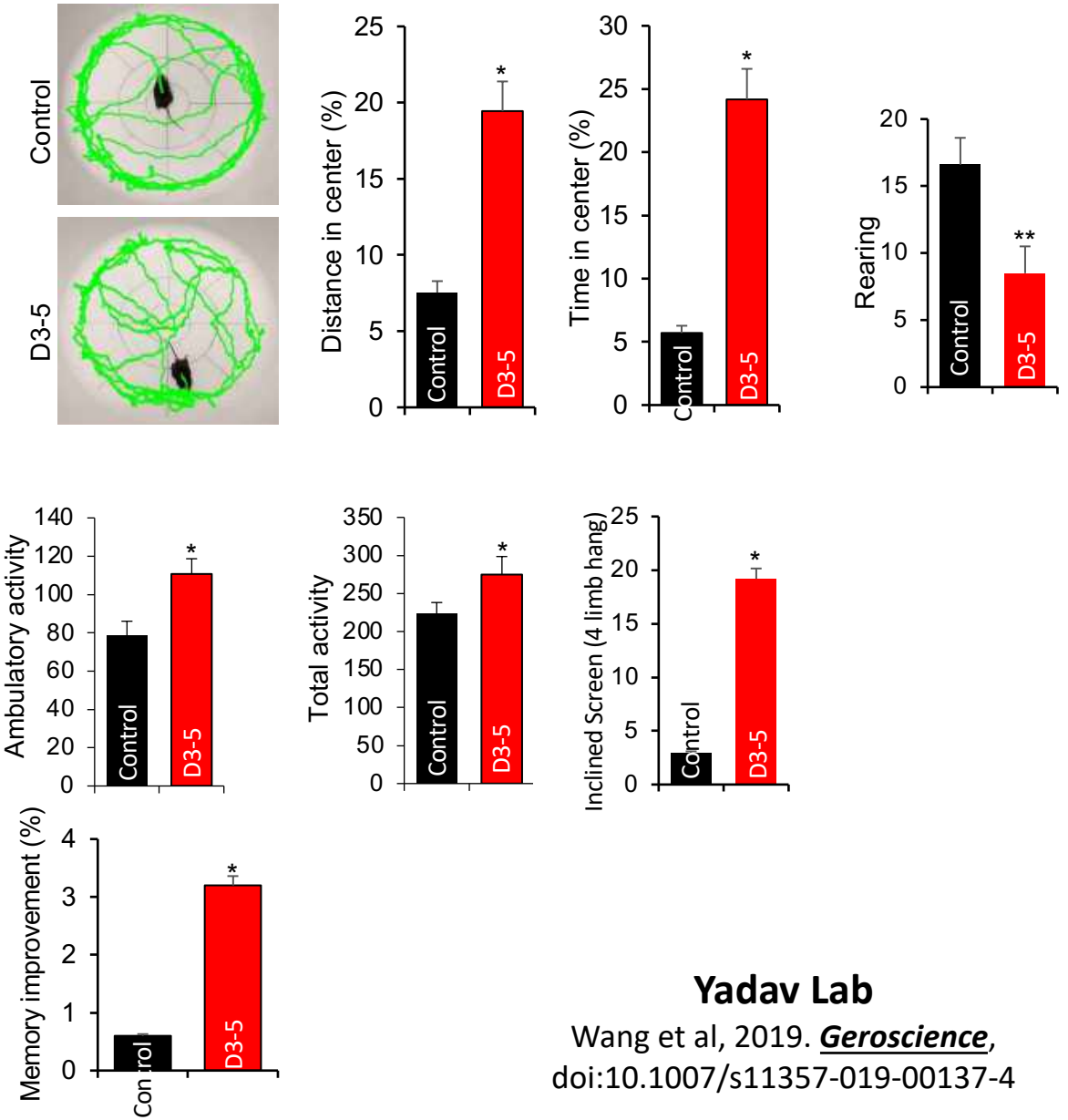
A postbiotic- D3.5 reduces aging-related comorbidities in older mice

Heat Killed *Lactobacillus paracasei* D3.5





Yadav Lab

Wang et al, 2019. ***Geroscience***, doi:10.1007/s11357-019-00137-4

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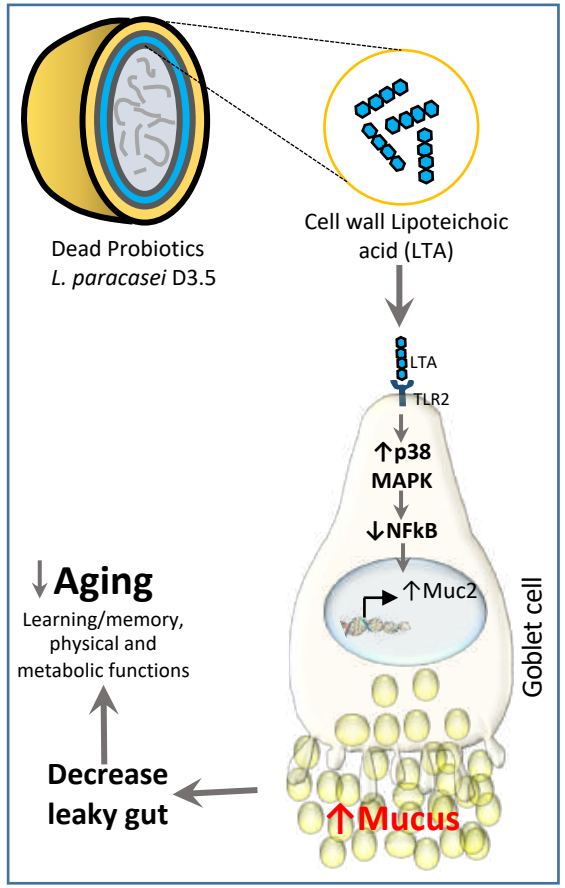
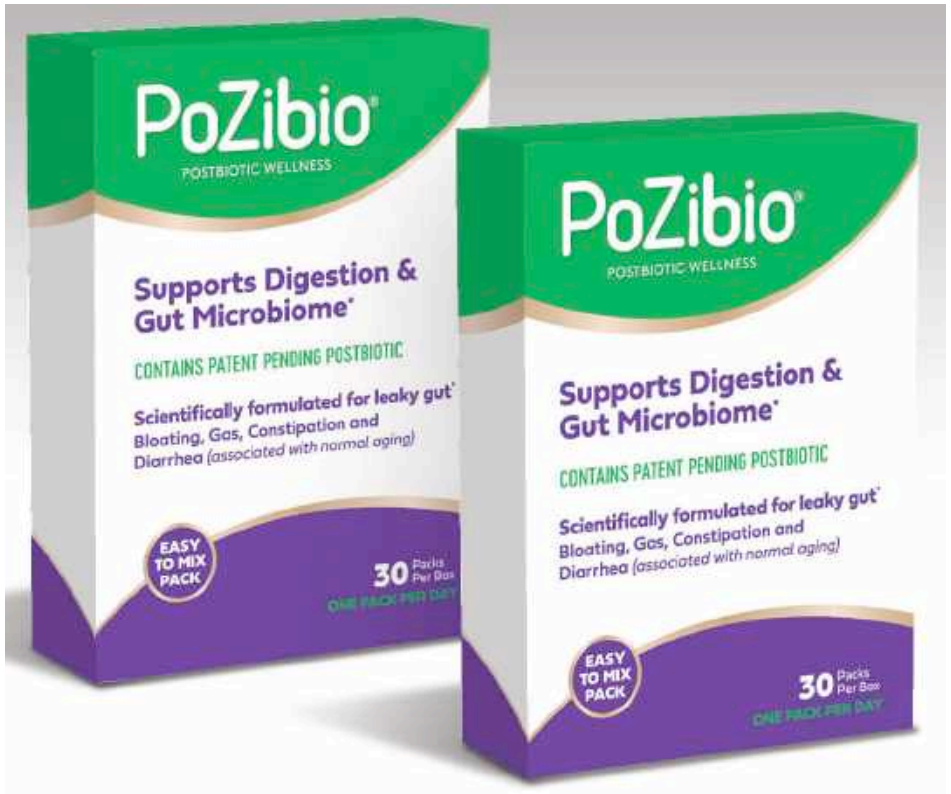
Probiotics cell wall component (LTA) reduces aging-related leaky gut and inflammation



Wang et al, 2019. ***Geroscience***, doi:10.1007/s11357-019-00137-4

Coming soon in the market with Postbiotics Inc



Partners are welcome!!

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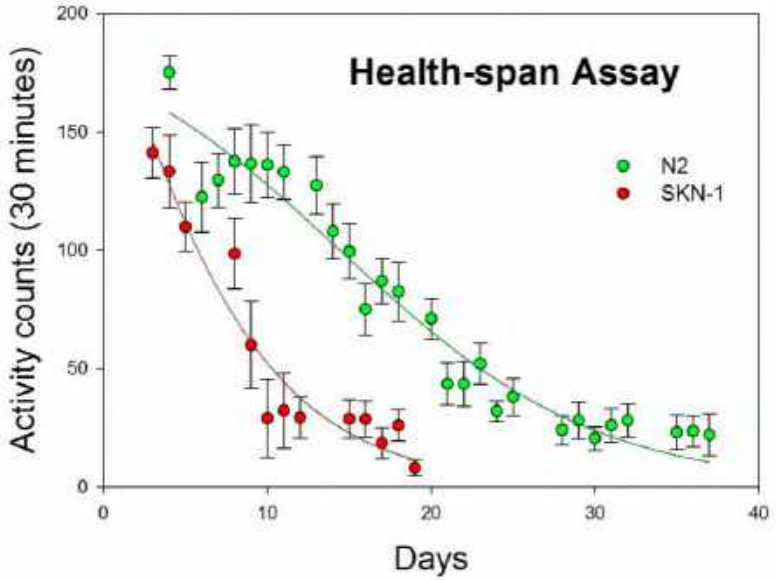
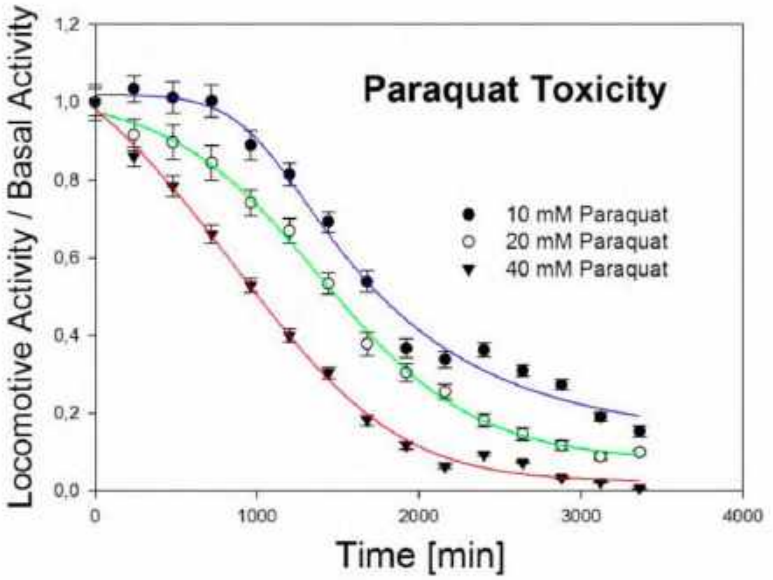
Large-scale screening of compounds for anti-aging effects





Welcome to use this system for your compounds!!

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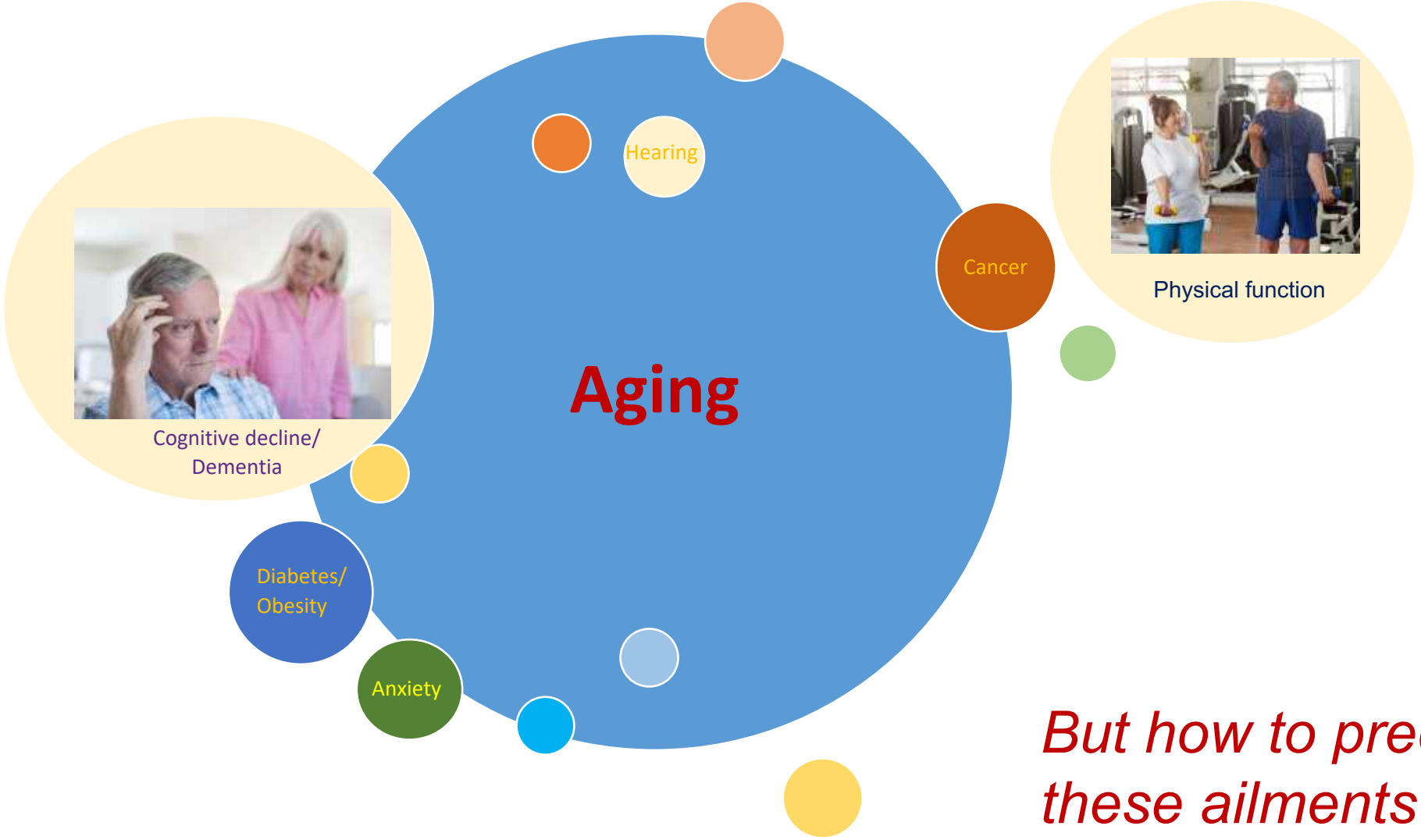
Summary #1

- Gut-brain communications are bidirectional and happens constantly through the day. Example is hunger-satiety
- Microbiome is important modulators which is dynamic and changes with aging
- Aging is not disease condition, however, manipulating aging biology can reduce comorbidities- Geroscience hypothesis
- Inflammation is a key risk factor for aging related disorders, and reducing leaky gut can using microbiome modulators like postbiotics can ameliorate aging related mental and physical disorders.
- Established a robust and high throughput anti-aging compound screening system

A new chapter began at USF, Tampa, FL



Cognitive decline/
Dementia

Physical function

But how to predict and prevent these ailments?

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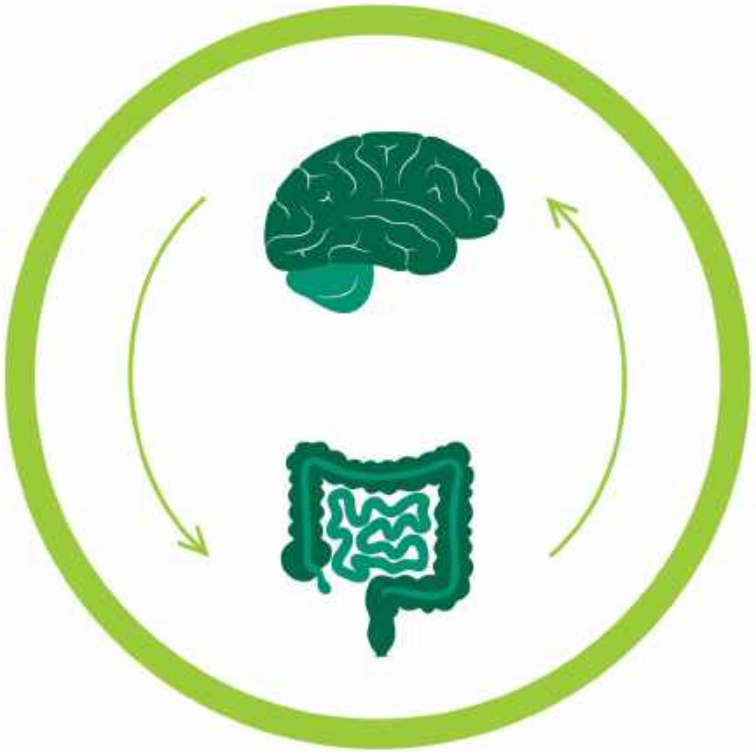
✓ We initiated a study called **Mi**crobiome in **a**ging **G**ut and **B**rain (**MiaGB**) consortium



MICROBIOME IN AGING GUT AND BRAIN (MiaGB) RESEARCH STUDY

USFHealth

ARE YOU 60 YEARS OR OLDER AND HAVE CONCERN FOR YOUR BRAIN HEALTH NOW OR IN THE FUTURE?

You may be eligible to participate in a research study determining how gut microbiome can influence your brain health during aging.

Participation may involve one hour of your time.

Contact Dr. Shalini Jain
jains@usf.edu or 813-974-6281

Conducted by USF Health Department of Neurosurgery and Brain Repair. IRB Study Number: STUDY002365

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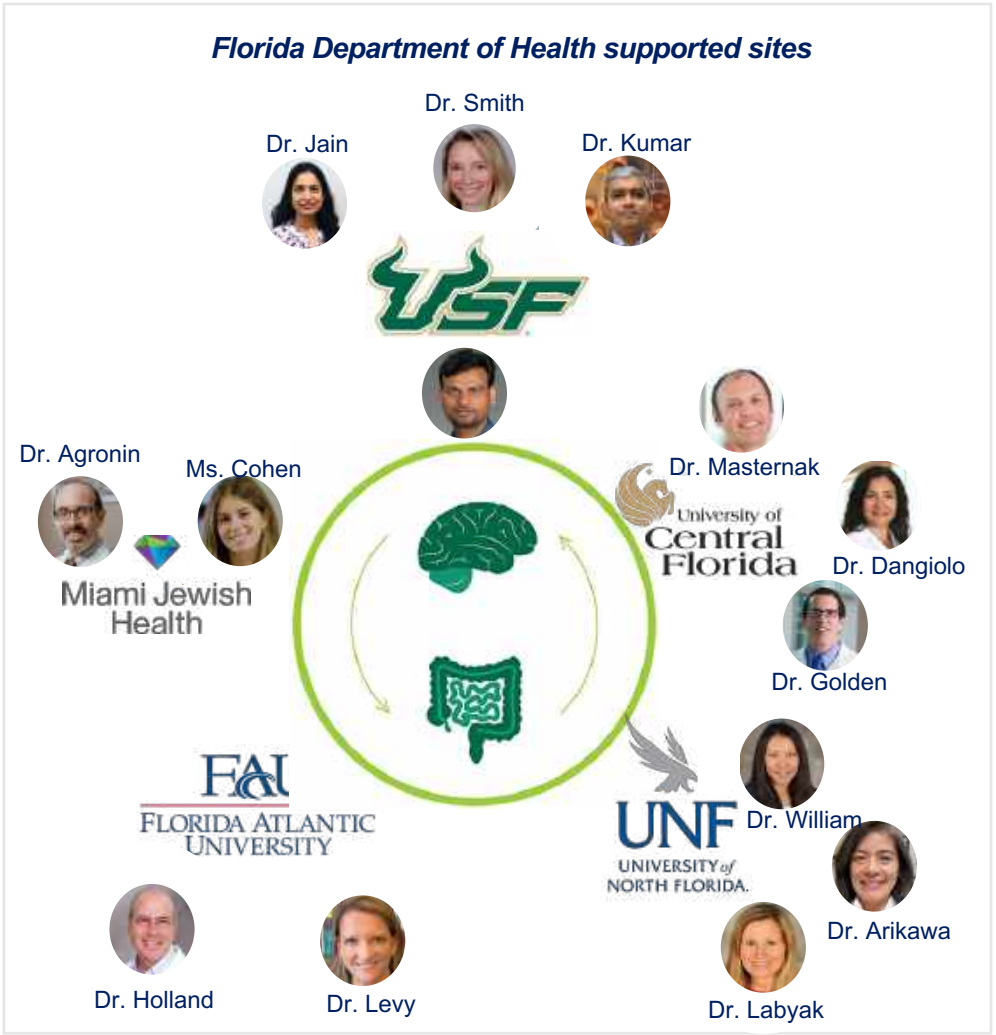
Microbiome in **a**ging of **G**ut and **B**rain (MiaGB) consortium



Recently funded by the **Florida Department of Health- Ed and Ethel Moore Alzheimer's Disease Research Program**

This puts us in **fore-front in Florida state**

As well as in the United States

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Microbiome in **a**ging of **G**ut and **B**rain (MiaGB) consortium

Recruitment:
Phase 1- Baseline
1. Healthy: 200
2. MCI: 100
3. AD/ related dementia: 100
4. Young healthy: 100

Phase 2: Prospective longitudinal follow-up for 4 years (Once in a year)
1. 200 Healthy
2. 100 MCI

Eligibility Criteria
- Older than 60 years
- Not taking antibiotics
- Not have brain and gut related surgeries
- Not have diarrhea, vomiting,
- 18-60 years (young healthy group)

- ✓ We have IRB approval
- ✓ Got funding from the Florida Department of Health
- ✓ Recruiting 5 sites- USF, UCF, FAU, UNF and Miami Jewish

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Measures and data we are collecting

Demographic and Exposomes

(Total no of outcomes-43)

- Demographic information
  Total no of outcomes-12
- Education, occupation, and economic status
  Total no of outcomes- 08
- Smoking history
  Total no of outcomes- 02
- Drinking history
  Total no of outcomes- 02
- Medical history information
  Total no of outcomes- 13
- Diet and activities
  Total no of outcomes- 06

Cognitive assessment

- Montreal cognitive Assessment
  Total no of outcomes-13
- 8-Item interview to differentiate aging and dementia
  Total no of outcomes-08
- Cognition decline questionnaire in Elderly
  Total no of outcomes-16
- Memory Impairment scheme
  Total no of outcomes-01
- Mini cog test
  Total no of outcomes-02

Measures and data we are collecting

Physical function assessment

- SPPB
- Grip strength
- 6 Minute walk
- Balance test

Biological samples

- Stools
- Saliva
- Blood
  - Whole blood
  - Plasma
  - PBMCs

Summary #2

✓ We launched a first-of-its-kind multisite study- MiaGB consortium to harness the potential microbiome-based markers to predict age-related cognitive decline and dementia risk.

- Collecting large sets of data and available for collaborations
- Developing markers to predict age-related cognitive and physical function decline
- Develop precision microbiome signatures and design products to improve personalized health

Acknowledgements and Collaborations

Our team

Hariom Yadav, PhD, Associate Professor
Shalini Jain, PhD, Assistant Professor
Shaohua Wang, PhD, Research fellow
Sidharth Mishra, Research associate
Vinod K Yata, PhD Postdoc fellow
Santosh Prajapati, Postdoc fellow
Diptaraj Chaudhari, Postdoc Fellow
Brandi Miller, PhD student
Meera Nagpal, MD/PhD student
Manan Mahani, BS/MD student
Mihir Kulkarni, BS/MD student
Juliana Madej, undergraduate student
Harris Chaudhary, BS/MD student

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Dr. Christian Brechot
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Dr. Paul Sanberg
Dr. Amanda Smith
Dr. Ming Ji
Dr. Bob Deschene
Dr. Cesar Borlongan
Dr. Paula Bickford
Dr. Laura Blair
Dr. Ambuj Kumar
Dr. Hongdao Meng
Dr. Wayne Guida
Dr. Shyam/Subhra Mohapatra
Dr. Ganesh Halade
Dr. Umesh Jinwal
Dr. Jennifer Glover
Dr. Keith Dombrowski
Dr. Mark Kindy

Moffit

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Dr. Brian Czerniecki
Dr. Krithika Kodumudi
Dr. Nam Tran
Dr. Anthony Patrizz
Dr. Erik Hayman

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