Postbiotic Metabolites:
The New Frontier in Microbiome Science

by

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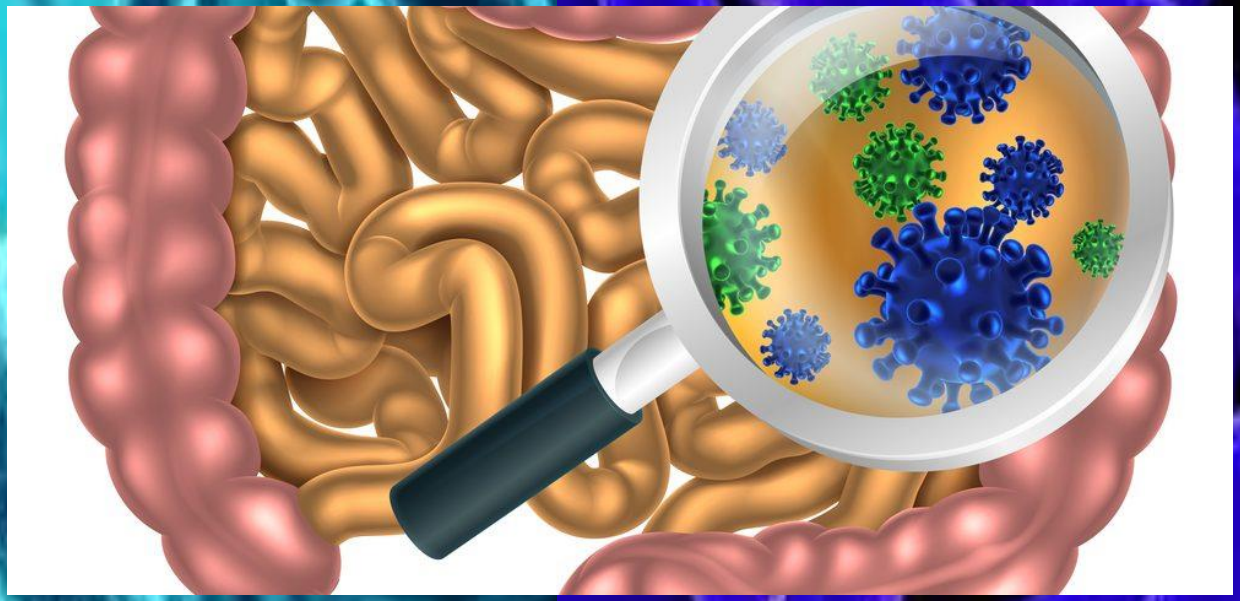

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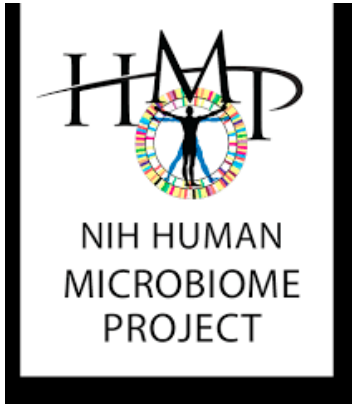
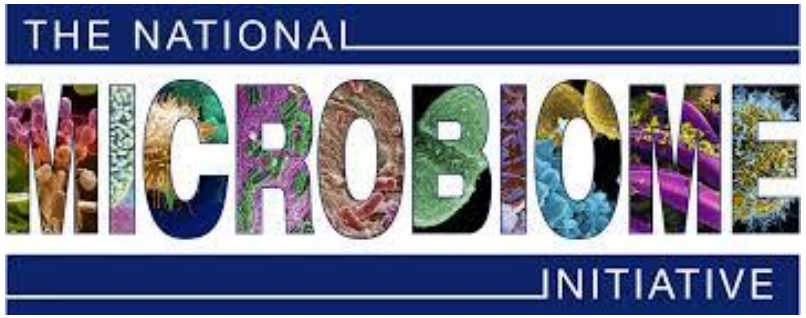
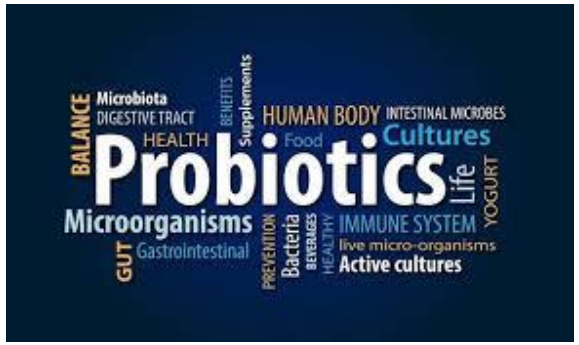






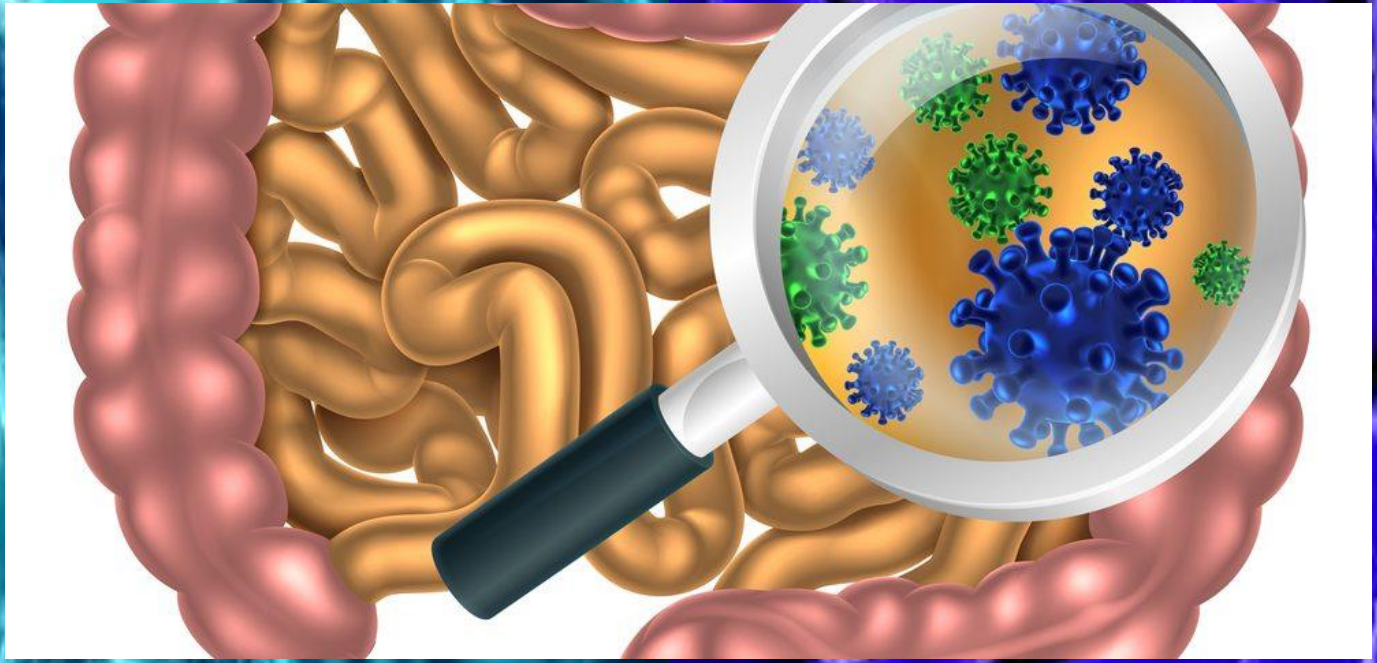
PubMed: 5,396 Microbiome studies in past 10 years (title)

Probiotics:
A Vast Universe of Micro-Organisms

The Gut Microbiome is a Critical Regulator of Health

but….

What is the mechanism of action……?
How Does It Function…..?

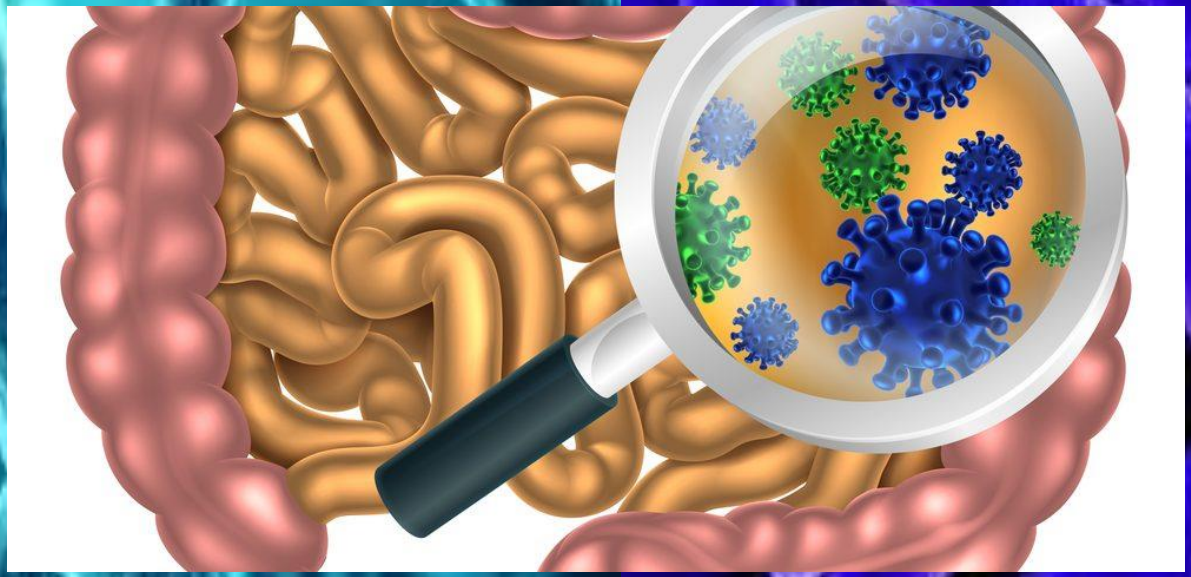


We are…..

a Human-Microbiome Superorganism

Microbiome Ecosystem: Probiotics + Postbiotic Metabolites

Over 99% of your DNA is the DNA of your bacteria

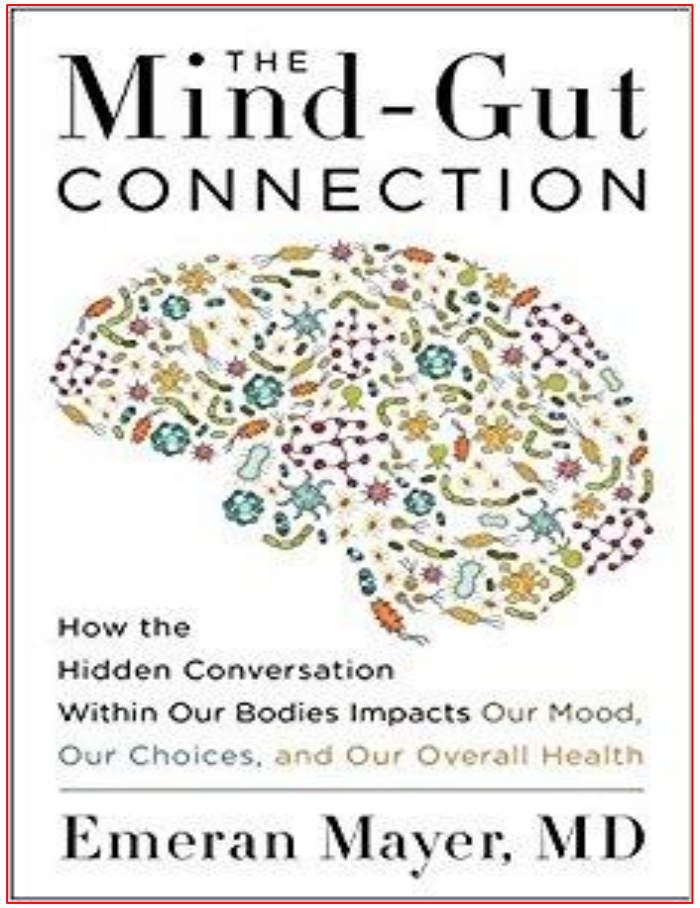


Why are probiotic bacteria important?

Because of the work they do…

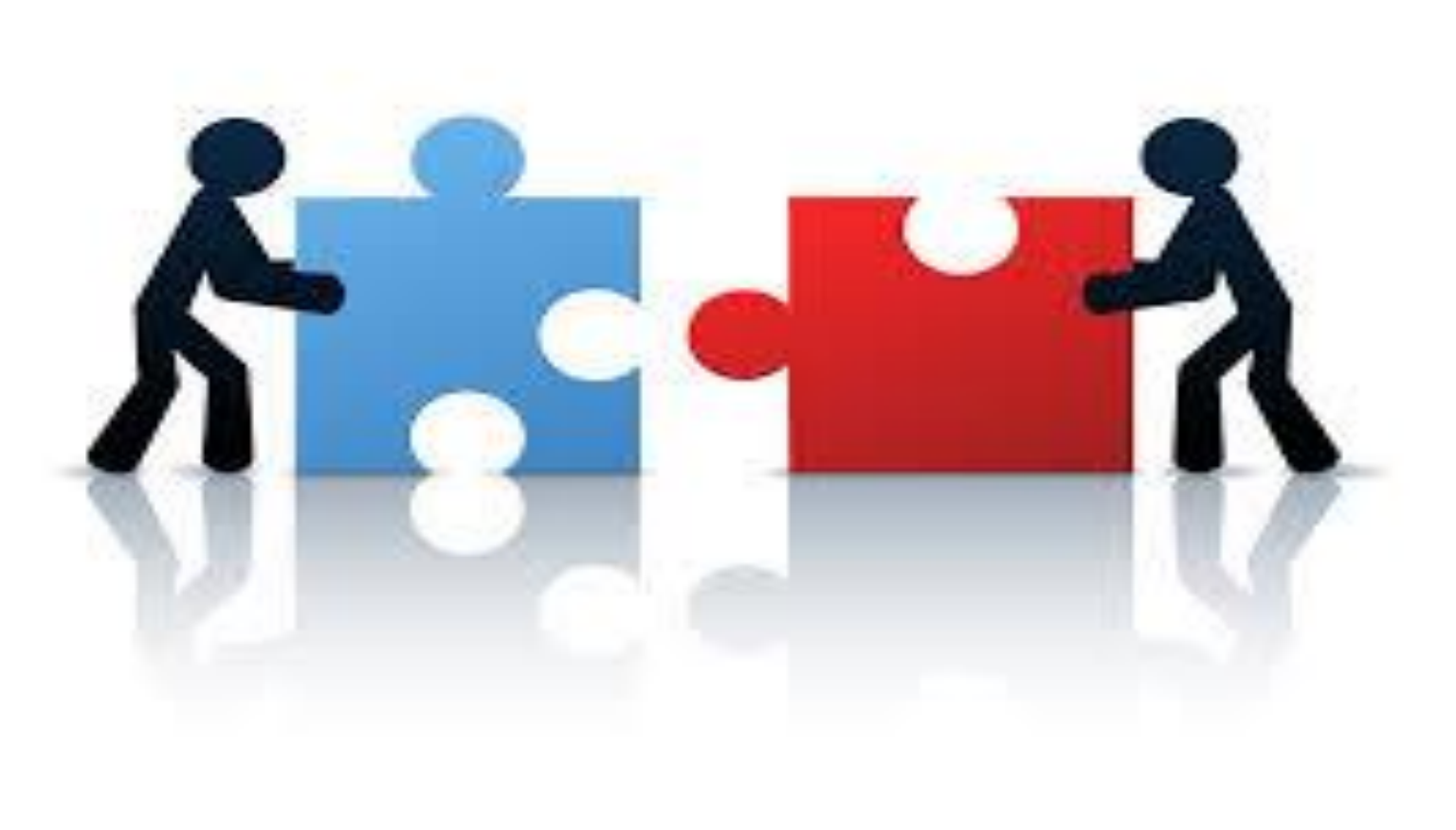
Probiotic bacteria convert food fibers into postbiotic metabolites

"Your bacteria use the information stored in their millions of genes to transform food into hundreds of thousands of metabolites."



Two Pieces To The Puzzle

Probiotic Bacteria + Dietary Fibers = Postbiotic Metabolites



PubMed: Postbiotic Metabolites

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- Aguilar-Toala JE, et al. ***Postbiotics: An evolving term within the functional foods field*.** Trends in Food Science & Technology. 2018 May;75:105-114.

Postbiotic Metabolites: The Foundation of Health

- Pelton R. ***Postbiotic Metabolites: The New Frontier in Microbiome Science***. Townsend Letter, June 2019;431:64-69.

- Pelton R. ***Beyond Probiotics: Postbiotic Metabolites Regulate Your Health***. Natural Medicine Journal, 2019 Mar 15.

Postbiotic Metabolites are…

Master Health Regulating Compounds in the body

Influence every organ system, especially the brain and immune system

How To Maintain A Healthy Microbiome

Consume a Big MAC Diet

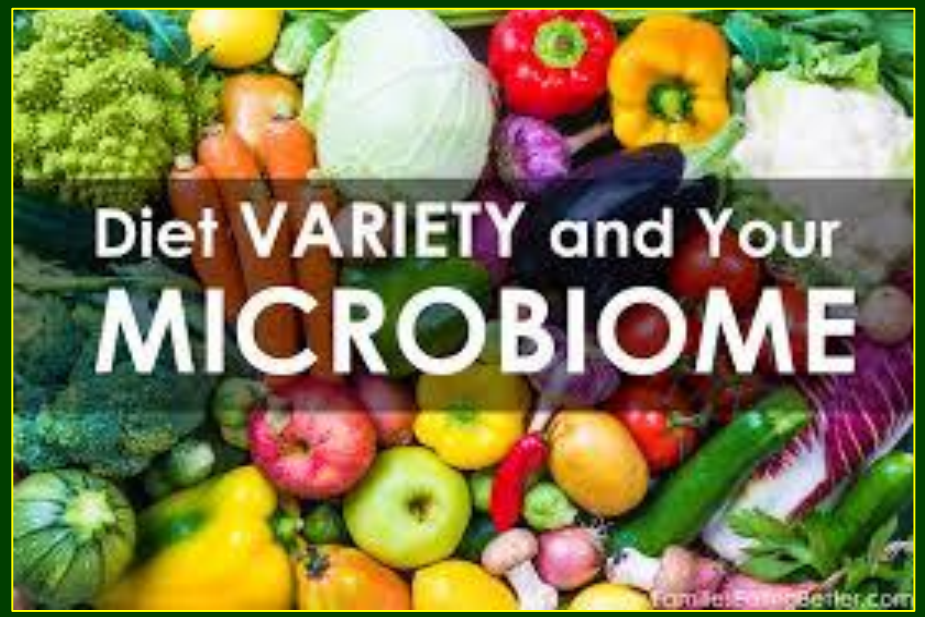
MAC = Microbiome Accessible Carbohydrates

How To Maintain A Healthy Microbiome

Consume a Big MAC Diet = Fiber-Rich Foods

MAC = Microbiome Accessible Carbohydrates

Microbiome Diversity



#1 factor to maintain a healthy microbiome?
You must feed your probiotic bacteria well
It takes more than probiotics….
A diverse range of fiber-rich foods
How many different fiber-rich foods will you consume today….?

↑ diversity fiber = ↑ diversity microbiome = ↑ diversity postbiotics

All ecosystems: ↑ diversity = stronger, more stable, more resilient

Categories of Postbiotic Metabolites

B-vitamins, vitamin K
Amino acids:, tryptophan, tyrosine & phenylalanine
SCFAs; acetic, lactic, butyric & propionic acids
Immune system-regulating compounds
Natural antibiotics-Antimicrobial peptides (AMPs) bacteriocins, defensins
Neurotransmitters; GABA, serotonin, acetylcholine
Polyphenols, antioxidants
CAZymes: Carbohydrate-Active enzymes/Microbiome Accessible Carbs
Fulvic acids

Multi-year Probiotic Fermentation Production Process

- 80 gallon Fermentation Vats
- Sterile manufacturing facility
- 12 strains of probiotic bacteria
- Dozens of organically grown foods
- 3-year fermentation period
- **Over 500 Postbiotic Metabolites**

Activity of Postbiotic Metabolites

- Anti-inflammatory activity
- Directly kill pathogens
- Accelerate growth of new epithelial cells
- Rebalance acid/base level
- Reestablish gut-brain communication
- Aid in healing leaky gut/intestinal permeability
- Aid in digestion and absorption of nutrients
- Enhance immune system
- Detoxify toxins
- Improve conditions in the GI tract fast…!!!

Highly Inflamed Intestines

Healthy Intestines

Probiotic Bacteria vs Postbiotic Metabolites

Just Ingest Probiotic Bacteria

- Bacteria must survive stomach acid
- They must “find” specific fiber-rich foods
- Must “fight” hostile ”bad” bacteria
- Entering a highly inflamed environment
- GI tract 10x to 100 x too alkaline

- **If** they survive, and **if** they find fiber-rich foods, then they must begin the process of fermenting those fibers into postbiotic metabolites …..**it takes time….!!!**

Directly Ingest Postbiotic Metabolites

↓

Postbiotic Metabolites Immediately begin transforming the microbiome ecosystem

Microbiome Science: New Directions

Identifying and naming species & strains of bacteria

↓

What are the compounds (postbiotic metabolites) the bacteria produce

What are the health-regulating effects of the postbiotic metabolites

Which strains most effectively produce health-regulating postbiotics

What are the specific fibers that each strain requires

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