

# The Great Microbiome: Our Greatest Ally for Optimal Health

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## Why A Healthy Microbiome Matters

- We contain 10x more microflora than we do human cells (100 trillion...about 3 lbs!)
- Breaks down complex carbohydrates to produce SCFAs that maintain a lower pH to reduce harmful bacteria and provide energy to colon epithelial cells
- Produces Vitamin K and increases calcium, iron and magnesium absorption for bone metabolism and blood circulation
- Controls expression of our genes to ↑ or ↓ regulation of intestinal barrier function, inflammation, immune response, and metabolism
- Regulates homeostasis of our immune system, more than 70% of which is in the gut
- Helps maintain normal metabolism and healthy body weight

## The Brain-Gut Connection: Why It Matters Even More!

- EC cells in the gut lining produce 95% of the body's Serotonin (Beattie & Smith, 2008)
- Gut-Brain Link: Vagus Nerve (Bravo et al, 2011)
- Specific bacterial strains in the gut produce/regulate neurotransmitters, including serotonin, dopamine, norepinephrine, GABA, acetylcholine and histamine (Clarke et al, 2014)
- Regulates hormones that affect Neuroendocrine Systems (the hypothalamic-pituitary-adrenal axis) (Farzi et al, 2018)

## How our garden grows: The Microbiome

- No bacteria in gut at birth; First mother's birth canal; Second exposure from mother's milk; Third exposure playing outdoors and interaction with others; Fourth from foods

## What decreases or changes Microflora in the Gut?

- Dietary Factors: Western diet (low intake of whole grains & fresh fruits and vegetables), sugar, artificial sweeteners, food pesticides and additives, chlorinated water
- Medications/Drugs: Antibiotics, PPI's, NSAIDS, etc; alcohol, tobacco
- Environmental Factors: stress, poor sleep, personal hygiene, cleaning products, household chemicals, outdoor vs. indoor
- Genetics

## Results of Low or "Modified" Gut Microbiota: Dysbiosis

- Dysbiosis: overgrowth of harmful bacteria, yeast and/or parasites overwhelms beneficial gut bacteria
- Dysbiosis damages intestinal lining, resulting in "Leaky Gut Syndrome"
- Leaky gut allows bacteria and undigested food particles to enter the bloodstream and joints
- Immune system treats as invaders and triggers inflammatory response

## Health Problems Related to Dysbiosis

- Disrupt neurotransmitters: behavioral health issues
- Dysregulation of neuroendocrine system: higher stress hormones
- Dysregulation of immune system: Increased food allergies, food sensitivities and autoimmune disorders
- Chronic pro-inflammatory and pro-oxidative stress: Increased risk for IBS, IBD, obesity, insulin resistance, dyslipidemia, oxidative stress, CVD, cancer (Neves et al, 2013)

## Behavioral Health Problems Associated with Leaky Gut

- Anger and hostility, anxiety, OCD, depression, bipolar disorder, eating disorders, ASD, ADHD