

# The Brain-Gut Food Connection and the Human Microbiome

Dr. Rosa De Vermette CC  
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## Did You Know?



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## The 3 Brains

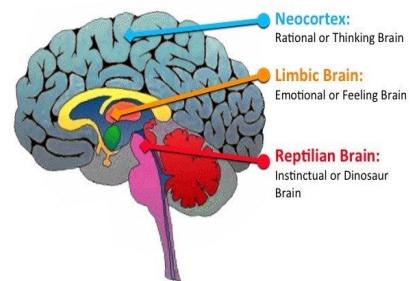
- \* Head Brain
- \* Heart Brain
- \* Gut Brain



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## Head Brain

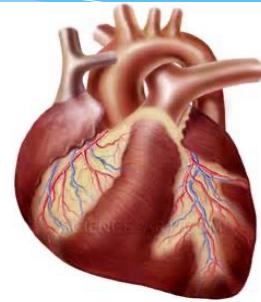
- \* **100 billion neurons**
- \* Cognitive Perception
- \* Thinking
- \* Making Meaning
- \* **CREATIVITY**



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## Heart Brain \*

- \* **40 000 neurons**
- \* Emotions
- \* Values
- \* Relational affect
- \* **Compassion**

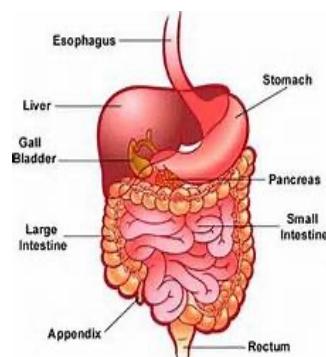


\* The heart has the strongest electromagnetic field

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## Gut Brain

- \* **100 million neurons**
- \* Core Identity
- \* Self Preservation
- \* Mobilization
- \* 30 Neurotransmitters
- \* 90% Serotonin and
- \* 50% Dopamine
- \* **COURAGE**



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## Brain Gut Connection and Communication Through the Vagus Nerve



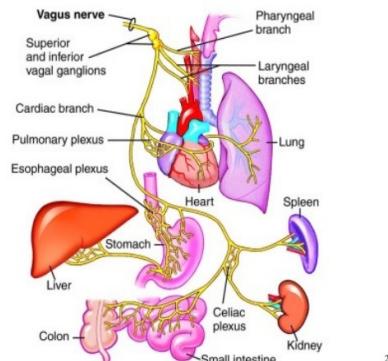
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## Brain Gut Connection

- The gut brain connection refers to the physical and chemical connections between the head brain and the gut brain.
- Neurotransmitters and other chemicals produced in your gut also affects the brain
- There are more than 30 neuro transmitters produced in the gut, the main ones are: **serotonin and dopamine**

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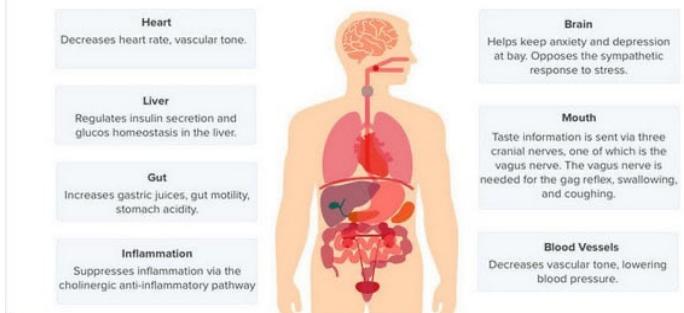
## How these 2 Brains Connect?



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## The Vagus Nerve

### How The Vagus Nerve Affects Organ Systems



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## Vagus Nerve (1)

- Longest of the cranial nerves
- 10<sup>th</sup> cranial nerve
- Connects the brain to the rest of the body
- Prevents inflammation
- Help us to make memories (norepinephrine-amigdala)
- Help us breath (acetylcholine)
- Controls heart rate variability(HRV)
- Initiates body relaxation response

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## Vagus Nerve 2

- It translates signals between your gut and your brain (walkie-talkie)
- Overstimulation of the vagus nerve is a common cause of fainting (vagal syncope)
- Electrical stimulation reduces inflammation and may inhibit it altogether
- Vagus nerve stimulation has created a new field of Medicine

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## Gut-Brain Neurotransmitters

- \* 90% Serotonin-sense of happiness and antidepressant
- \* 50% Dopamine- feel good hormone
- \* Some production of GABA-amino butyric acid
  - \* Reduce stress
  - \* Relieve anxiety
  - \* Improve sleep

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## Signs of an Unhealthy Gut

- Upset stomach
- Unintentional weight changes
- Sleep disturbances or constant fatigue
- Skin irritation
- Autoimmune conditions
- Food intolerance

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## How Can We Increase Production of Dopamine and Serotonin Naturally

- \* Exercise
- \* Spend time in nature
- \* Nutrition
- \* Meditation
- \* Gratitude
- \* Essential Oils
- \* Goal achievement
- \* Happy Memories
- \* Novelty
- \* Therapy

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## What Decreases Serotonin Level

- \* Caffeine
- \* Alcohol
- \* Nicotine
- \* Artificial sweeteners
- \* Sugary snacks
- \* Cholesterol lowering medication

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## The Gut-Brain Connection Diet Foods Rich In Omega 3 Fats

- \* Anchovies
- \* Cod liver oil
- \* Salmon
- \* Mackerel
- \* Herring
- \* Pumpkin seeds
- \* Flax seeds
- \* Walnuts
- \* Chia seeds
- \* Leafy greens (e.g., kale, spinach)

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## The Gut-Brain Connection Diet Fermented foods

- \* Yogurt
- \* Sauerkraut
- \* Kimchi
- \* Miso
- \* Tempeh
- \* Pickles
- \* Sour Cream
- \* Natto
- \* Kombucha
- \* Kefir
- \* Yogurt (with live cultures)
- \* Grass fed cheese

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## The Gut-Brain Connection Diet High Fiber Foods

- \* Apples
- \* Asparagus
- \* Avocado
- \* Bananas
- \* Barley
- \* Buckwheat
- \* Cabbage
- \* Celery
- \* Chicory root
- \* Garlic
- \* Onion
- \* Legumes (beans, lentils)

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## The Gut-Brain Connection Diet Food Rich In Polyphenols

- \* Cocoa or dark chocolate
- \* Berries
- \* Green tea
- \* Extra virgin Oil
- \* Coffee
- \* Red wine

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## The Gut-Brain Connection Diet Foods Rich in Tryptophan

- \* Almonds
- \* Chickpeas
- \* Pumpkin seeds
- \* Milk
- \* Turkey
- \* Cheese (cottage, cream)
- \* Eggs
- \* Soybeans
- \* Tuna
- \* Avocado
- \* Seaweed
- \* Spirulina
- \* Oat Bran

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## The Gut-Brain Connection Diet Foods Rich in Vitamin B12 and folate

- \* Salmon
- \* Organ meats
- \* Anchovies
- \* Clams
- \* Meat and Poultry
- \* Eggs
- \* Spirulina
- \* Seaweed
- \* Nutritional yeast flakes
- \* Shiitake mushrooms

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## The Gut-Brain Connection Diet

### Ways to Improve Your Gut Health

- \* Take probiotics and eat fermented food
- \* Eat prebiotic fiber
- \* Eat less sugar and sweeteners
- \* Reduce stress
- \* Avoid taking antibiotics unnecessarily
- \* Exercise regularly
- \* Get enough sleep
- \* Use different cleaning products
- \* Avoid smoking
- \* Eat a vegetarian diet

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## The Gut-Brain Connection Diet

### Foods That Naturally Boost Serotonin

- \* Salmon
- \* Poultry
- \* Eggs
- \* Spinach
- \* Turkey
- \* Cheese
- \* Green tea
- \* Almonds
- \* Seeds
- \* Milk
- \* Soy products
- \* Nuts
- \* Cacao
- \* Anchovies
- \* Sweet potato
- \* Sauerkraut

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## How Can We Restore The Brain Gut Connection

- \* Diet
- \* Exercise
- \* Limit medications
- \* Stress Management
- \* Meditation
- \* Mindfulness
- \* Breathing Exercises
- \* Yoga

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## Things You Can Do for Your Gut Health

- Lower your stress level (MEDITATE/BREATH)
- Get enough sleep
- Eat slowly
- Stay hydrated
- Take a prebiotic (vegetables) and a probiotic (fermented food)
- Check for food intolerances
- Change and adjust your diet

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## Root Cause of Chronic Disease

- Poor life style choices
  - Smoking
  - Overuse of alcohol
  - Poor diet
  - Lack of physical activity
  - Stress
  - Lack of sleep

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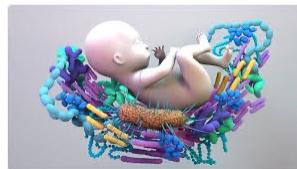
## Conclusion Gut Brain Connection (GBC)

- \* The GBC consists of bidirectional communication between the CNS and ENS, linking emotional and cognitive centers of the brain with peripheral intestinal function.
- \* The bidirectional communication of the GBC is enabled by the Vagus Nerve.
- \* Good GBC diet is vital for the production of serotonin and Dopamine and for maintaining a healthy bacteria in the gut positively impacting mood disorders and the immune system

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## What is the Microbiome?

- The human microbiome is the population of more than 100 trillion microorganisms that colonize our gut, mouth, skin and elsewhere in our body
- Thousands of different microbial species colonize our bodies, together contain over one hundred times more genes than our genome.



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## Our Body: A Collection of Microbial Ecosystems

We have 10 times more microbial cells in our body than human cells and the majority lives in our guts especially in the large intestine.



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## How do we develop our microbiome

- In utero
- Mode of birth
  - Vaginal delivery
  - Caesarean section
- Completely developed by 3- 5 years of age

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## Dietary Sources of Prebiotics

<ul style="list-style-type: none"><li>* Whole grains</li><li>* Apples</li><li>* Leeks</li><li>* Onions</li><li>* Garlic</li><li>* Cocoa extract</li><li>* Bananas</li><li>* Asparagus</li></ul>	<ul style="list-style-type: none"><li>* Nuts</li><li>* Seeds</li><li>* Red wine extracts</li><li>* Root vegetables</li><li>* Beans</li><li>* Lentils</li><li>* Chickpeas</li><li>* Green tea extracts</li></ul>
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## Probiotic foods

- \* Idli and Dosa
- \* Pickles
- \* Dhokla
- \* Yogurt
- \* Kefir
- \* Buttermilk
- \* Cheese and Paneer
- \* Apple
- \* Dark Chocolate
- \* Soy Milk

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## Benefits of Having a Healthy Microbiome

- Strong immune system
- Heart health
- Brain health
- Improved mood
- Healthy sleep
- Effective digestion
- May help prevent some cancers and auto immune disease

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## Healthy Microbiome

- Healthy
- Happy
- Strong
- Resilient



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BE HAPPY!



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