

# **Food for Thought – Nutritional Psychology & the Role of Nutrition in Mental Wellness**

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# Outline

1. Nutrition plays well-known effects on "physical health and wellness" - including cardiovascular, musculoskeletal, and cellular.
2. Less well-known are the effects of nutrition on "mental" health and wellness - including depression, anxiety, pain, and burnout.
3. The emerging field of "Nutritional Psychology" describes the biochemical/physiological basis for the behavioral/psychological effects of nutrition and lifestyle choices to impact mental wellness.
4. This presentation will describe research-supported nutrition modalities to positively influence mental wellness - including pre/probiotics, plant polyphenols ("phytobiotics"), essential fatty acids, and traditional herbal therapies.



# MENTAL WELLNESS



# OUR MISSION

We create natural mental wellness products for a community of passionate people who desire an extraordinary life



# GRIM REALITY

- Americans spend over \$100 billion annually on “feel better” products, from painkillers and anti-depressants to alternative and complementary therapies
- 100 million Americans suffer from chronic pain – this is one of the top reasons for the \$100 billion expenditure
- 350 million people globally are affected by depression each year – another major reason for the \$100 billion expenditure
- 90% of adolescents have a depressive disorder before the age of 18



# GRIM REALITY

- 800,000 people die of suicide each year – that’s over 2000 suicides per day
- 24 million people, some as young as 12 years old, received treatment for illicit drug or alcohol abuse in 2016
- 1 in 5 new mothers in the U.S. report postpartum depression each year
- The World Health Organization calls stress “the health epidemic of the 21st century”
- 85% of the nation’s 20 million college students reported feeling overwhelmed by stress - and more than 35% reported feeling “depressed” to the point of dysfunction

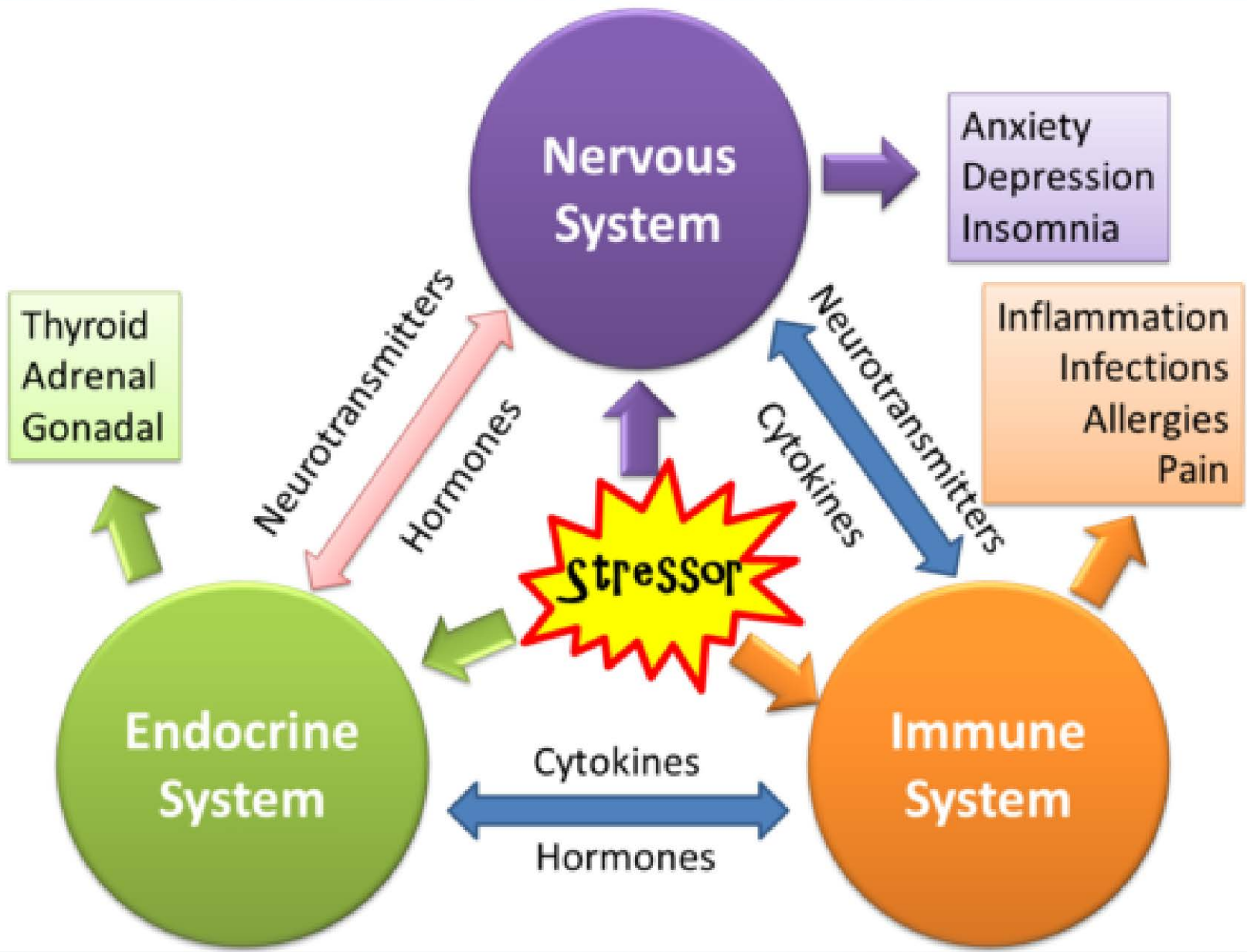


**S:**  
**back pain, neck pain, joint**  
**pain, arthritis, & anxiety**



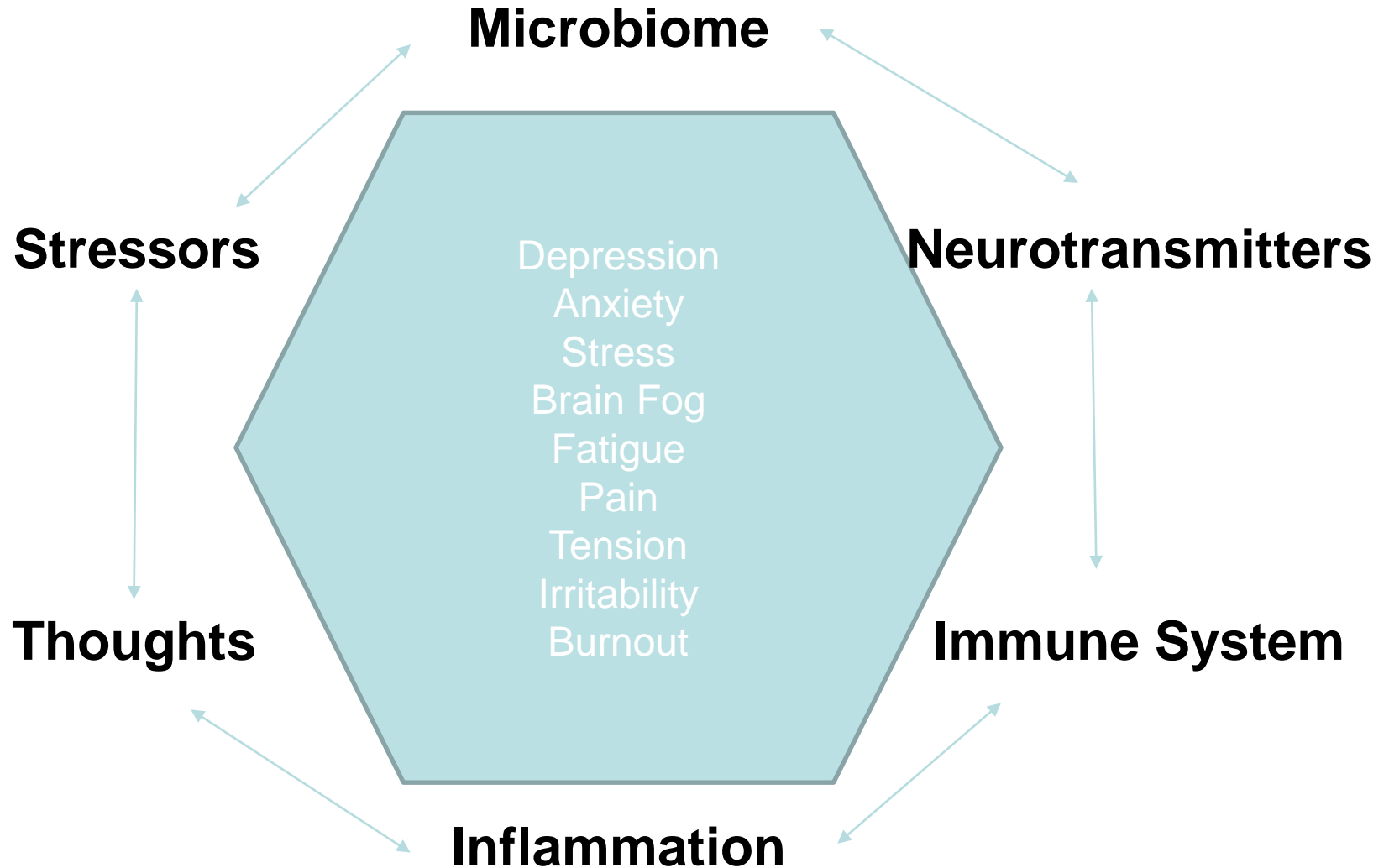
U.S. consumer supplement sales  
= \$52.5B by 2020



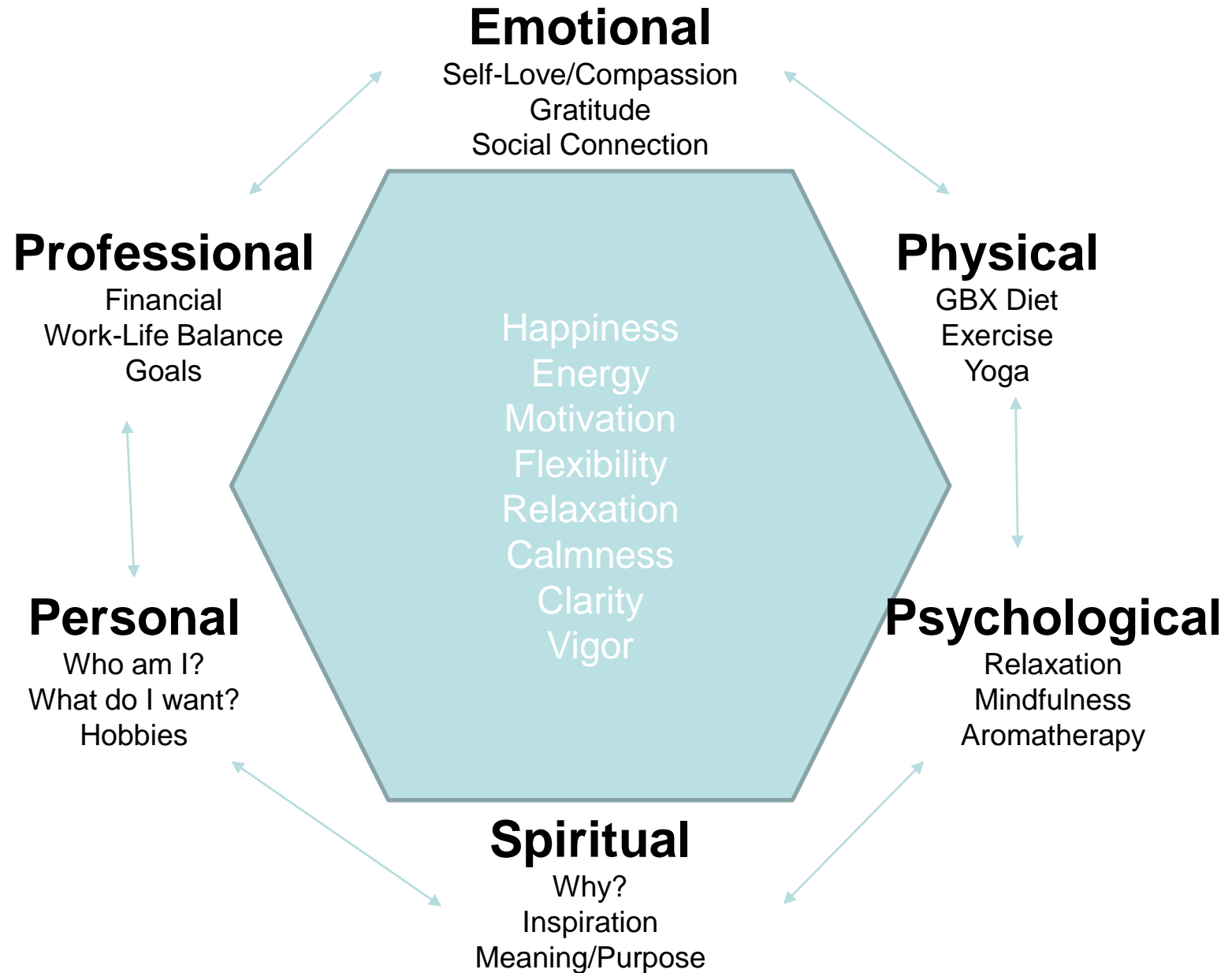


Hypothalamus = homeostatic interface between electricity of nervous system & hormones/neurotransmitters of endocrine/immune systems

# Multi-Factorial Problem



# Multi-Factorial Solution



# The NEW Science of Mental Wellness

Science has forever focused on the BRAIN as the primary source to addressing mental wellness problems & answers.

We've been relying highly on antidepressants and other forms of serotonin reuptake inhibitors (SSRIs) to resolve these issues.

**BUT IS THIS THE RIGHT SOLUTION?**



# New Era in Science/Medicine



1600s



1900s



1800s



2000s



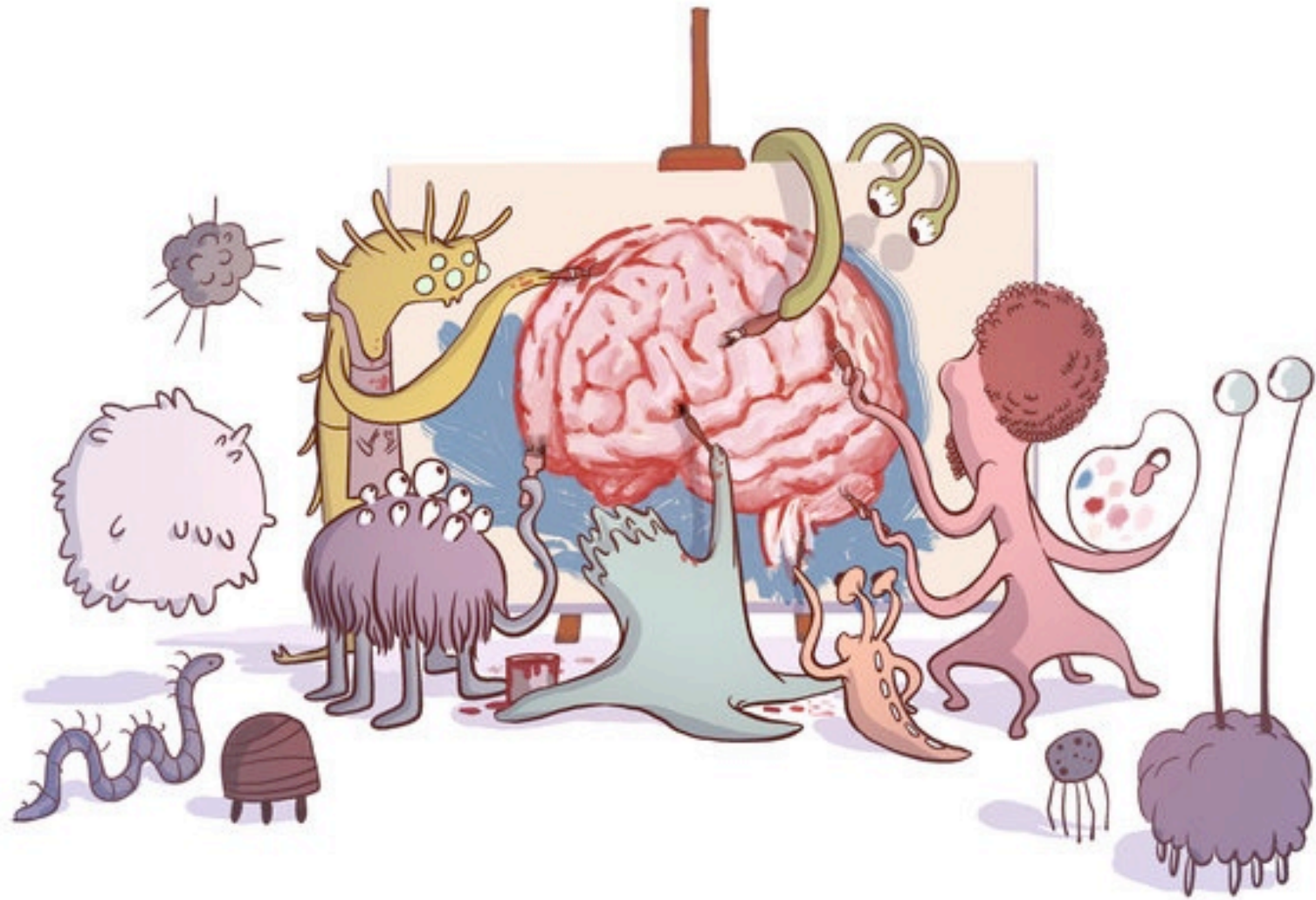
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# RECENT SCIENTIFIC DISCOVERIES

- Science now tells us that we actually have a **SECOND BRAIN!**
- There has been a massive scientific shift towards the **MICROBIOME**, also known as our gut and second brain, as being the source to addressing mental wellness issues.

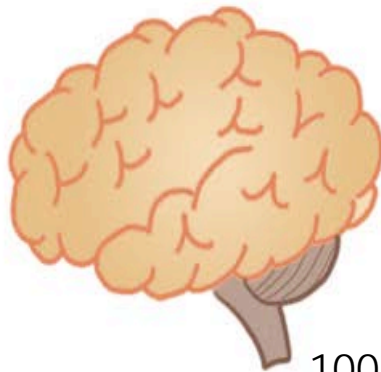
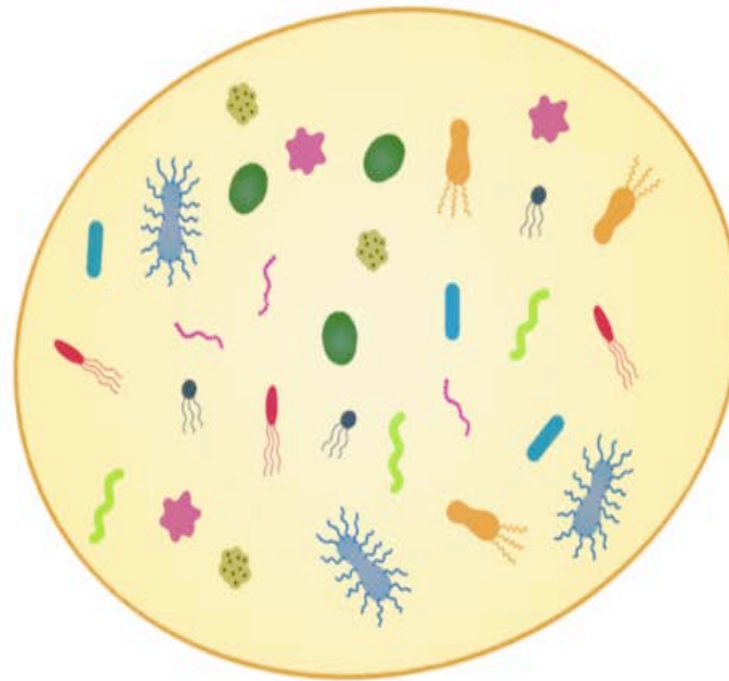




# The Forgotten Organ

## Microbiota:

100 trillion cells  
~0.9 kg – 2.7 kg



## Brain:

100 billion cells  
~1.2 kg



## Heart:

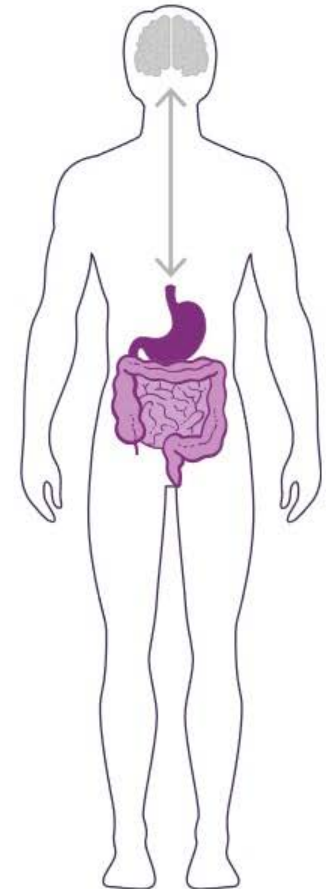
~0.3 kg



# DID YOU KNOW?

- **90% of the cells in your body are non-human**
  - Human genes = ~23,000
  - Bacterial genes = ~20 million (~1,000x **MORE** than human genes)
- **Microbiome is an ecological community of trillions of bacteria living symbiotically in/on our body**
  - "2<sup>nd</sup> Brain" = 3-4 lbs (approximately the same size as our 1<sup>st</sup> brain)

**YOUR GUT IS CONSIDERED  
YOUR SECOND BRAIN**



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# HOW IMPORTANT IS YOUR MICROBIOME?

- Communicates with the brain to regulate health, weight, immune function, digestive function, mood, and overall mental health.
- What we put in our bodies affects the microbiome, which in turn affects our mind and other crucial bodily systems

## IN BALANCE

Feeling Great

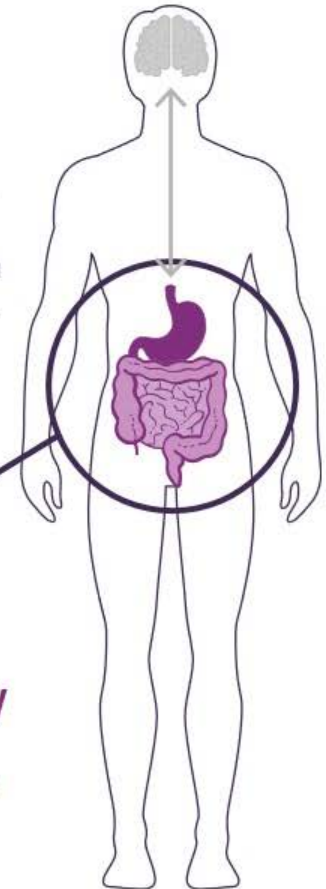
## OUT OF BALANCE

Feeling fatigue, sad, tense, hungry, heavy, bloated, confused, stiff/sore

The microbiome plays an important role in the way you feel mentally & physically.



This explains why you have those "GUT-FEELINGS"



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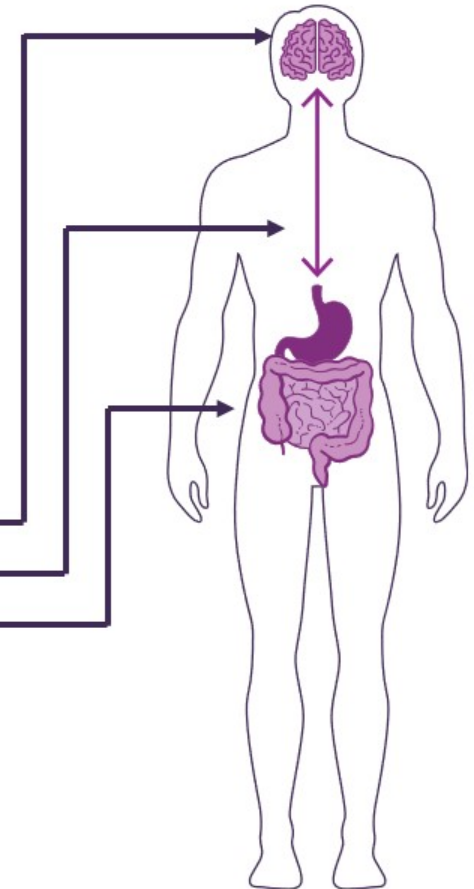
# HOW DO YOUR "TWO BRAINS" COMMUNICATE?

Our "two brains" communicate through a highly extensive network, known as the **gut-brain axis (GBX)**.

## NETWORK CONSISTS OF:

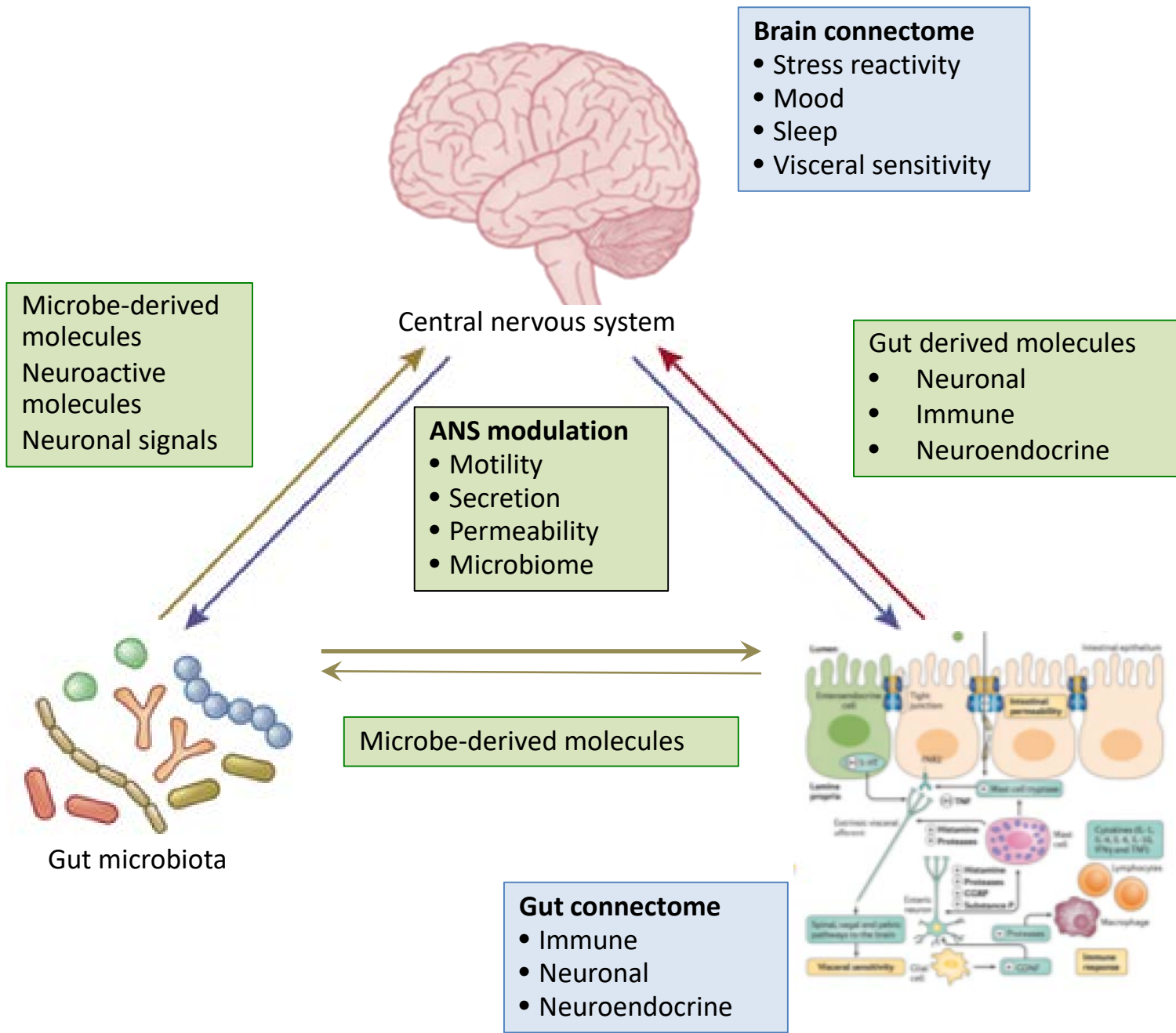
- "wires" – nerves
- "chemicals" – neurotransmitters/hormones
- "cells" – immune system

The GBX connects our **nervous system (brain)**, **immune system (axis)**, and **gastrointestinal system (gut)** with a vast array of cellular and biochemical messengers throughout the entire body, which include the microbiome, hormones, cytokines, and neurotransmitters.



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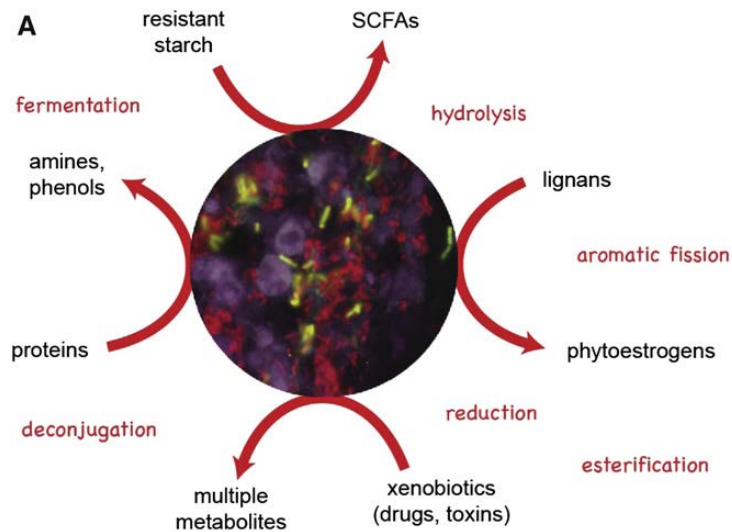
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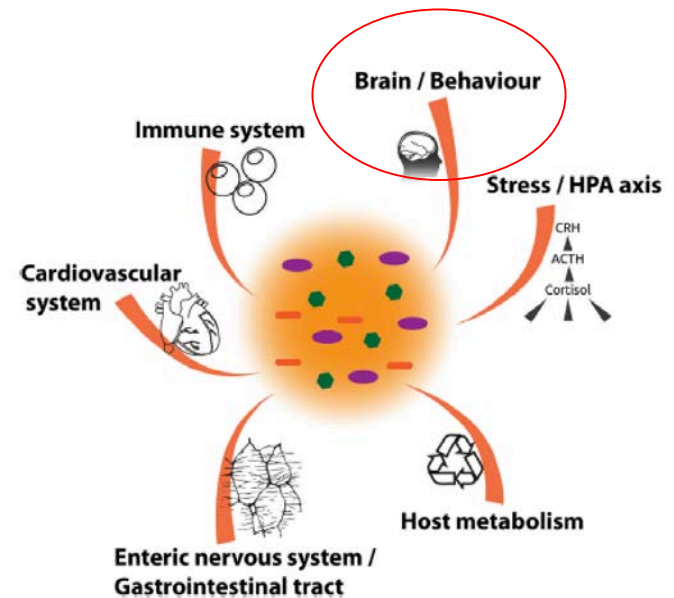
Modified from Fung, Hsiao et al, Nature Neuroscience 2017

# What Gut Microbes Do Most of the Time

What they produce



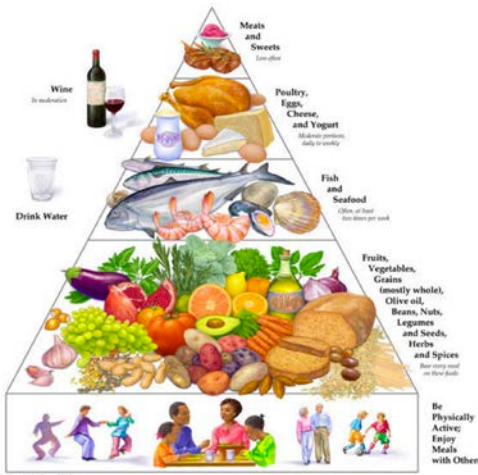
With whom they communicate



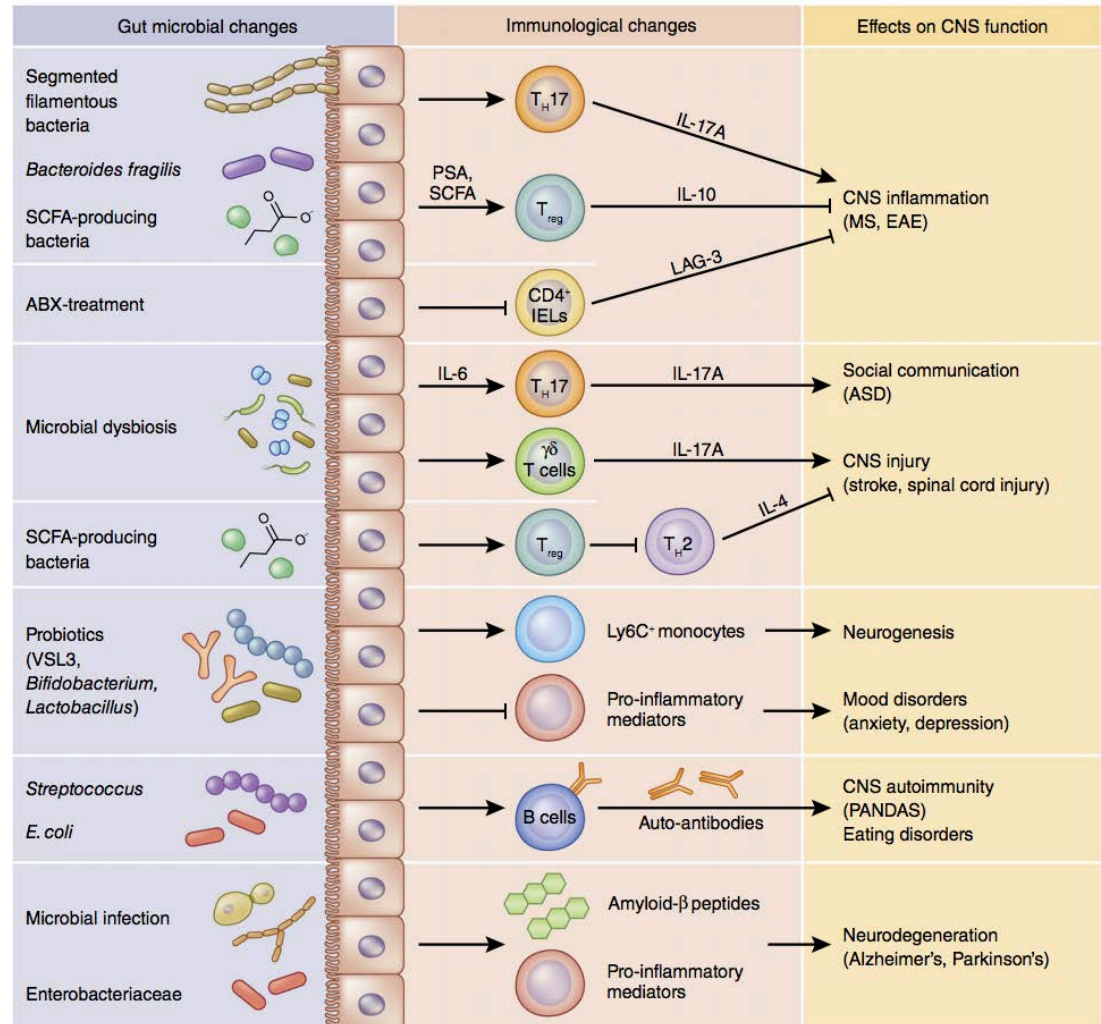
# Modulation of BGM Interactions by Food and the Brain



**Mediterranean Diet Pyramid**  
A contemporary approach to delicious, healthy eating



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Modified from Fung, Hsiao et al, Nature Neuroscience 2017

# Stress-Induced Brain Gut Microbiome Interactions

Psychosocial Stress



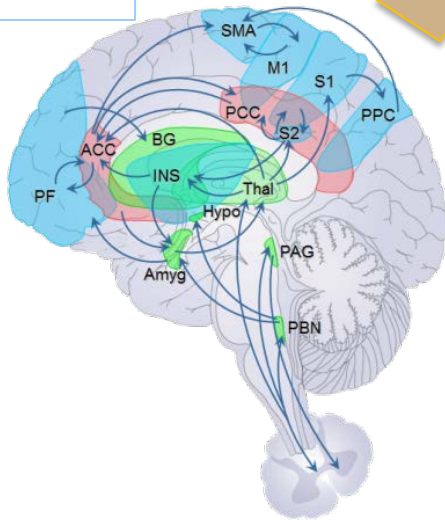
Anxiety  
Fear  
Anger  
Sadness  
Pain



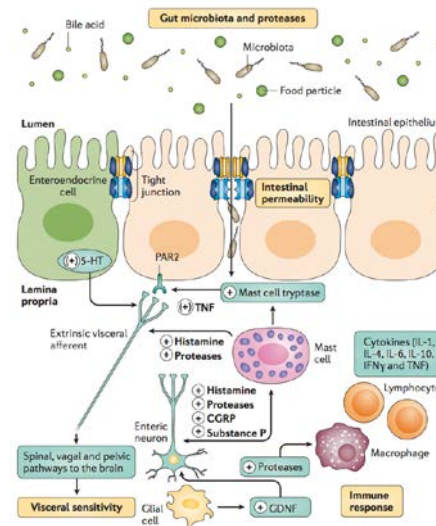
Diarrhea  
Pain  
Discomfort

# Stress-Induced Brain Gut Microbiome Interactions

Psychosocial Stress



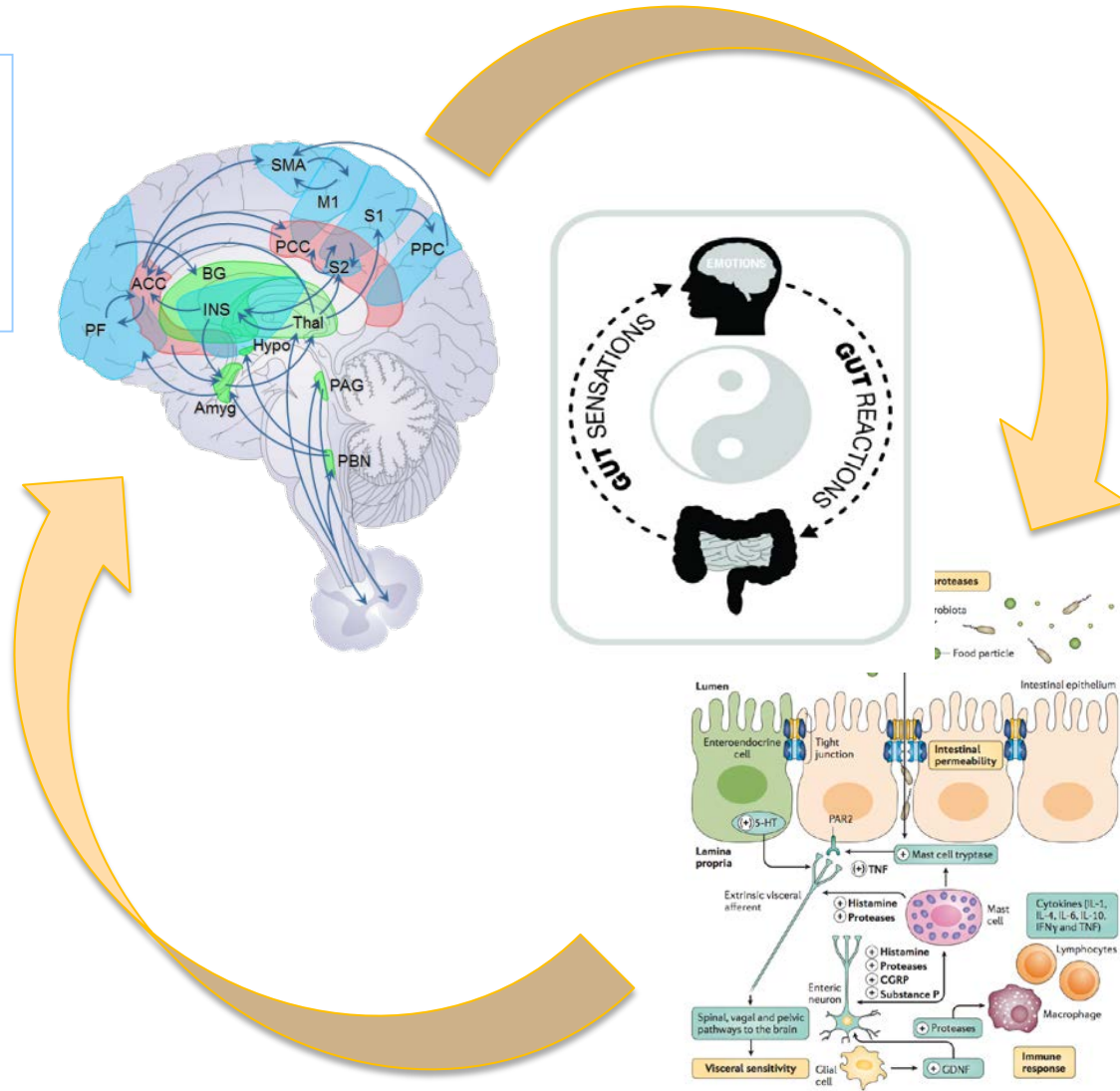
Anxiety  
Fear  
Anger  
Sadness  
Pain





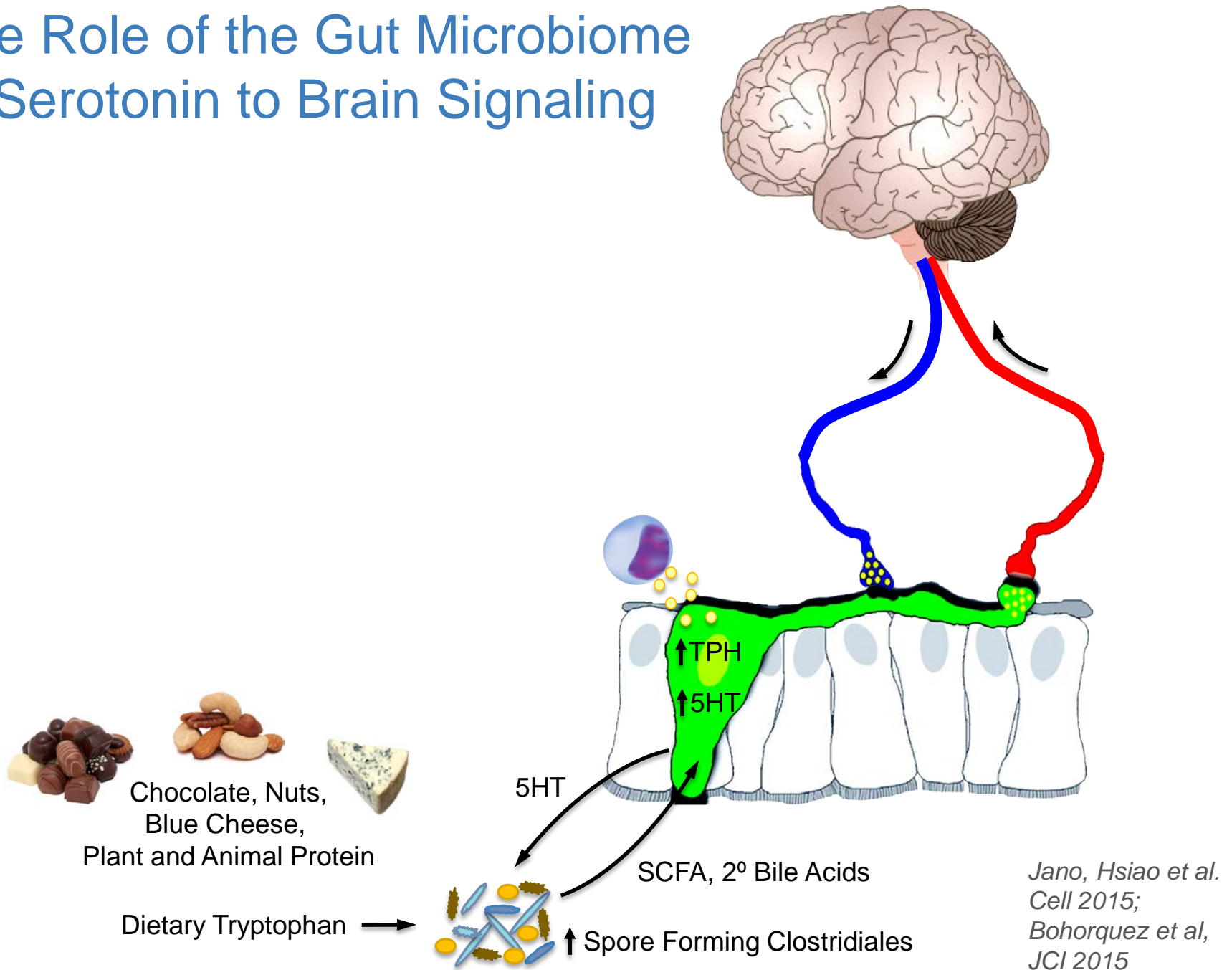
# The Mind Body Concept of Emotions

Anxiety  
Fear  
Anger  
Sadness  
Pain



Belly discomfort,  
Belly pain  
Diarrhea,  
Constipation

# The Role of the Gut Microbiome In Serotonin to Brain Signaling



**Timid  
“Introvert”**



Normal gut  
microbes



**Outgoing  
“Extrovert”**



Germ-free



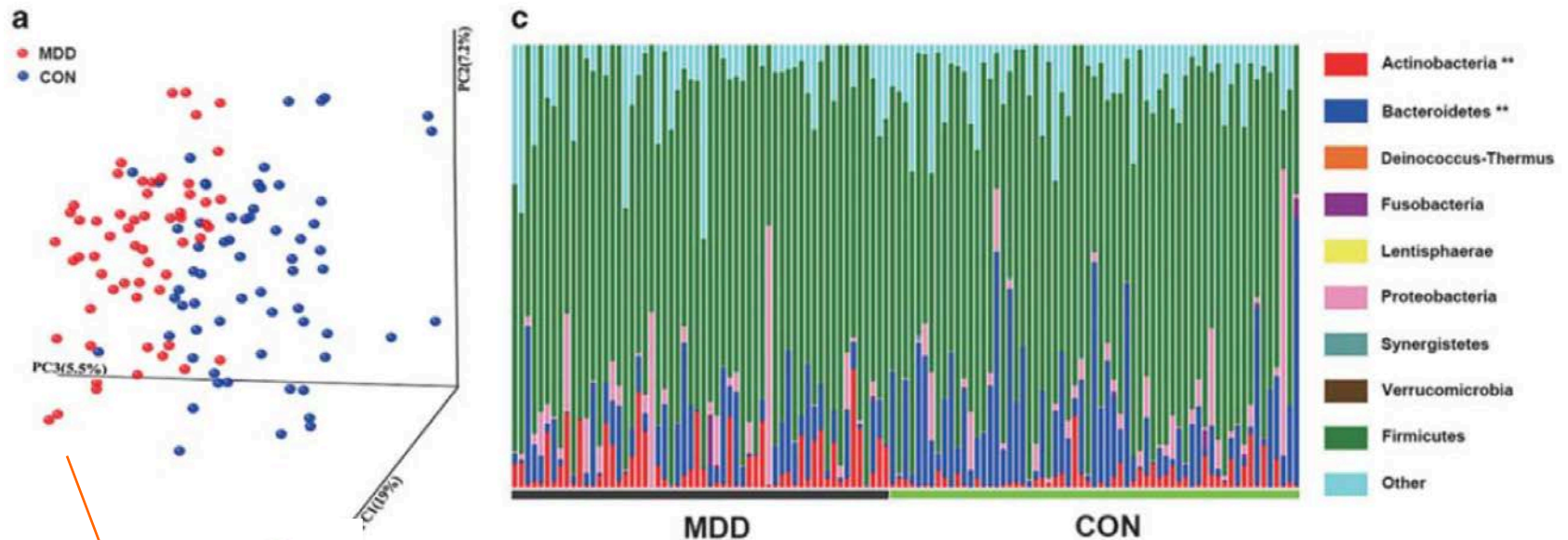
**Timid  
“Introvert”**



Transplanted

## ORIGINAL ARTICLE

## Gut microbiome remodeling induces depressive-like behaviors through a pathway mediated by the host's metabolism



**Obese  
Overeating**



Obesogenic  
microbiota

**Lean**



Germ-free

**Obese  
Overeating**



Obesogenic  
microbiota

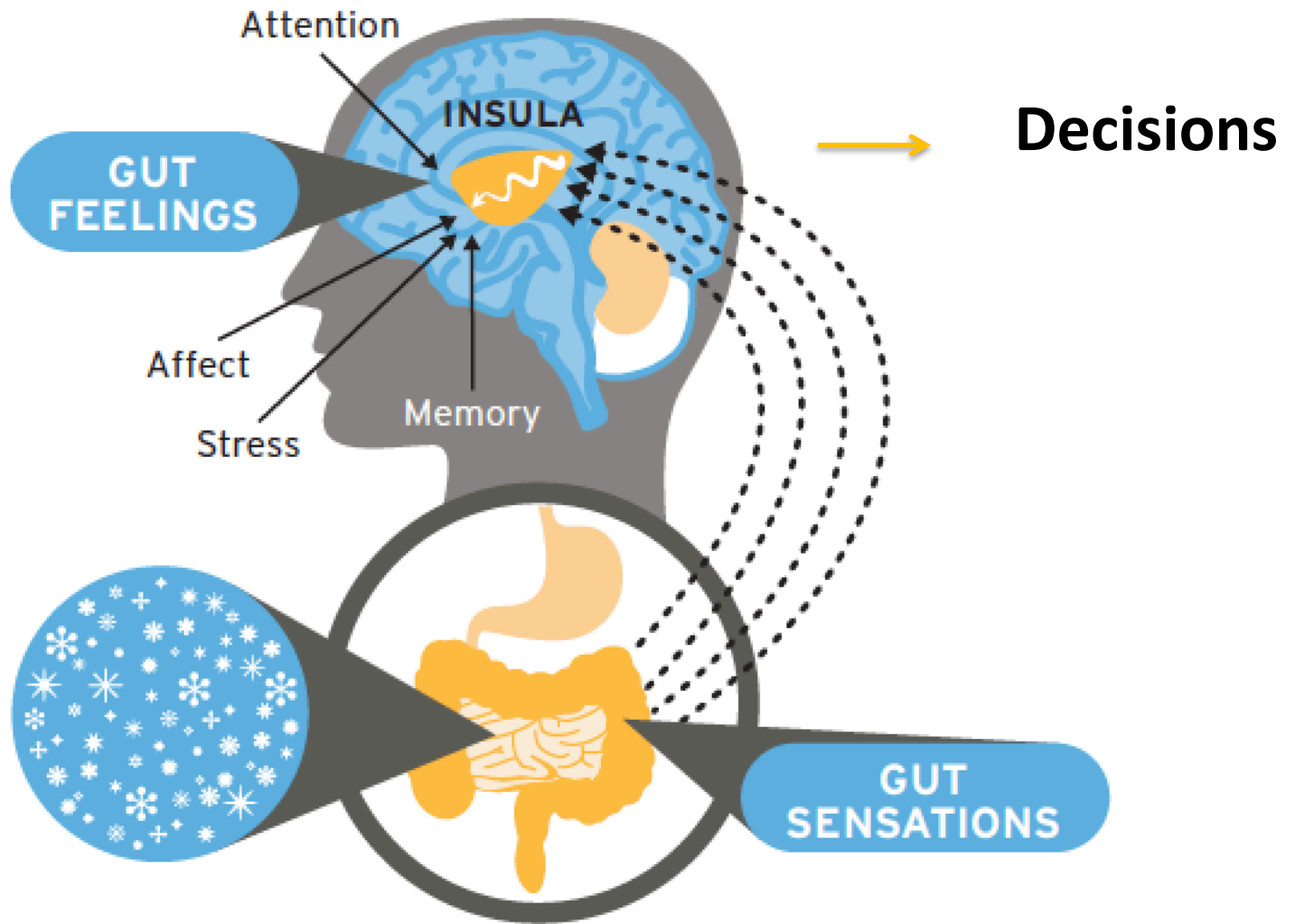
# Gut-Based Decision Making

## ***Rational decision making:***

- Slow, linear, objective, weighing multiple options (+/- lists), advice from others, evaluating data

## ***Gut-based decision making:***

- Rapid, intuitive, subjective, deeply personal,
- The “secret author of many of the choices and judgements [we]... make.” *Daniel Kahneman*



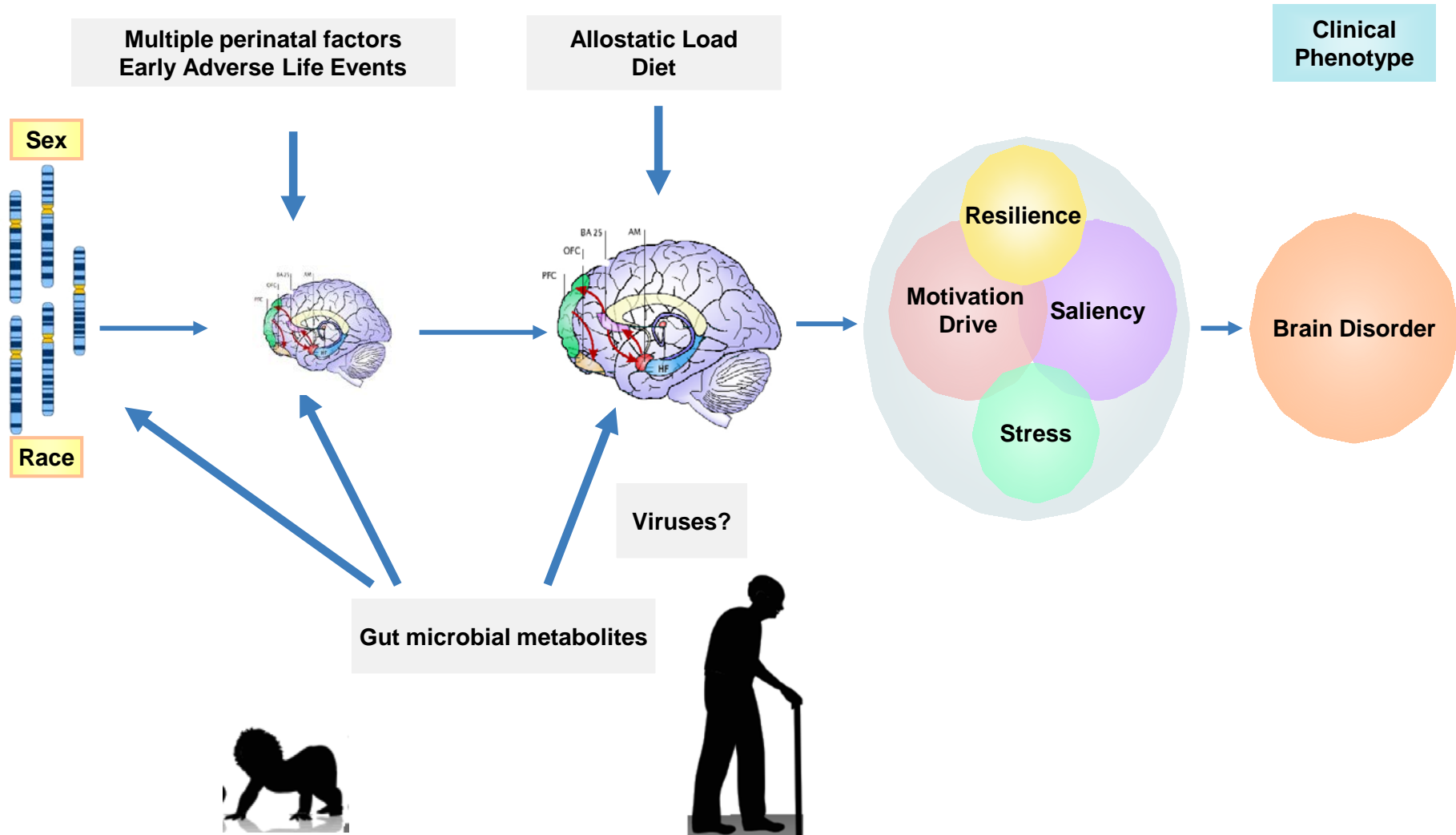
# Antibiotic Consumption by the Numbers

- >73 billion doses worldwide yearly
- 258 million courses (833/1000) in USA (2010):
- 2.7 courses by age 2; 10.9 courses by age 10





# Putative Role of Gut Microbial Metabolites in Brain Development and in Activity of Brain Circuits



# The Standard American Diet (SAD)



Salt

Sugar

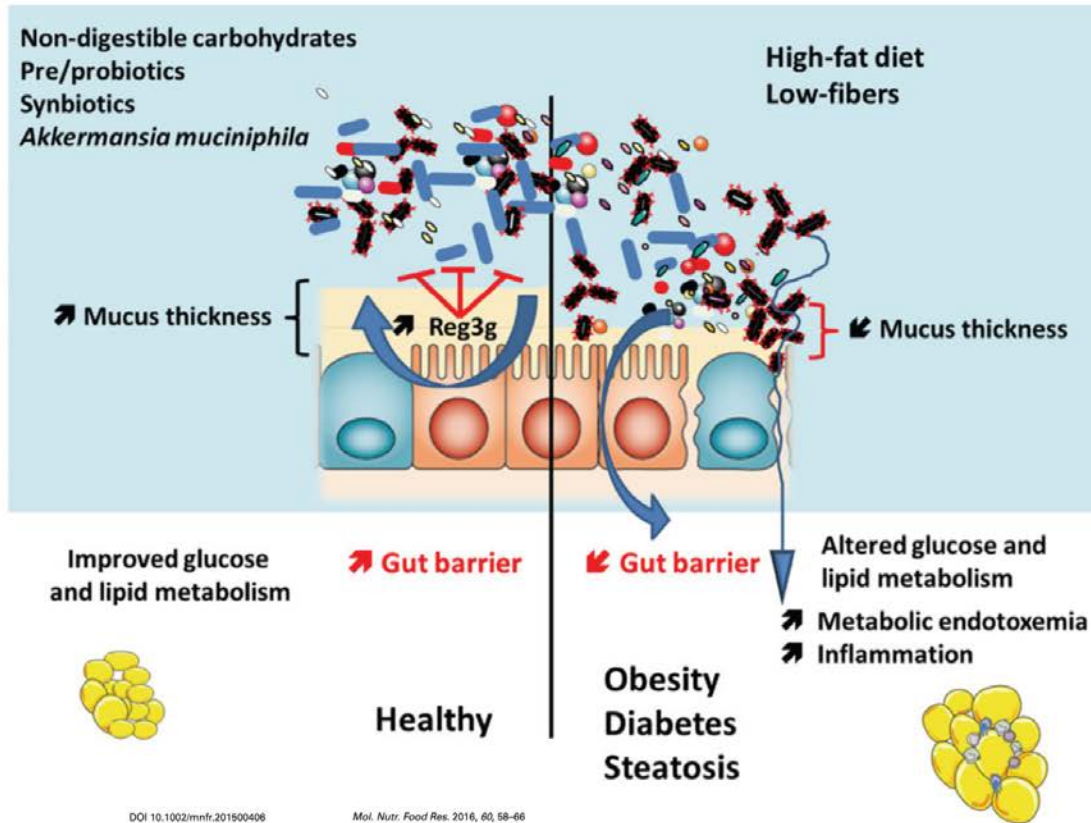
Animal Fat

Processed food

Non caloric sweeteners

Emulsifiers

# Diet induced Microbiome Perturbations Can Result in Local and Systemic Immune Activation

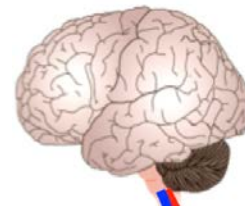


## Talking microbes: When gut bacteria interact with diet and host organs

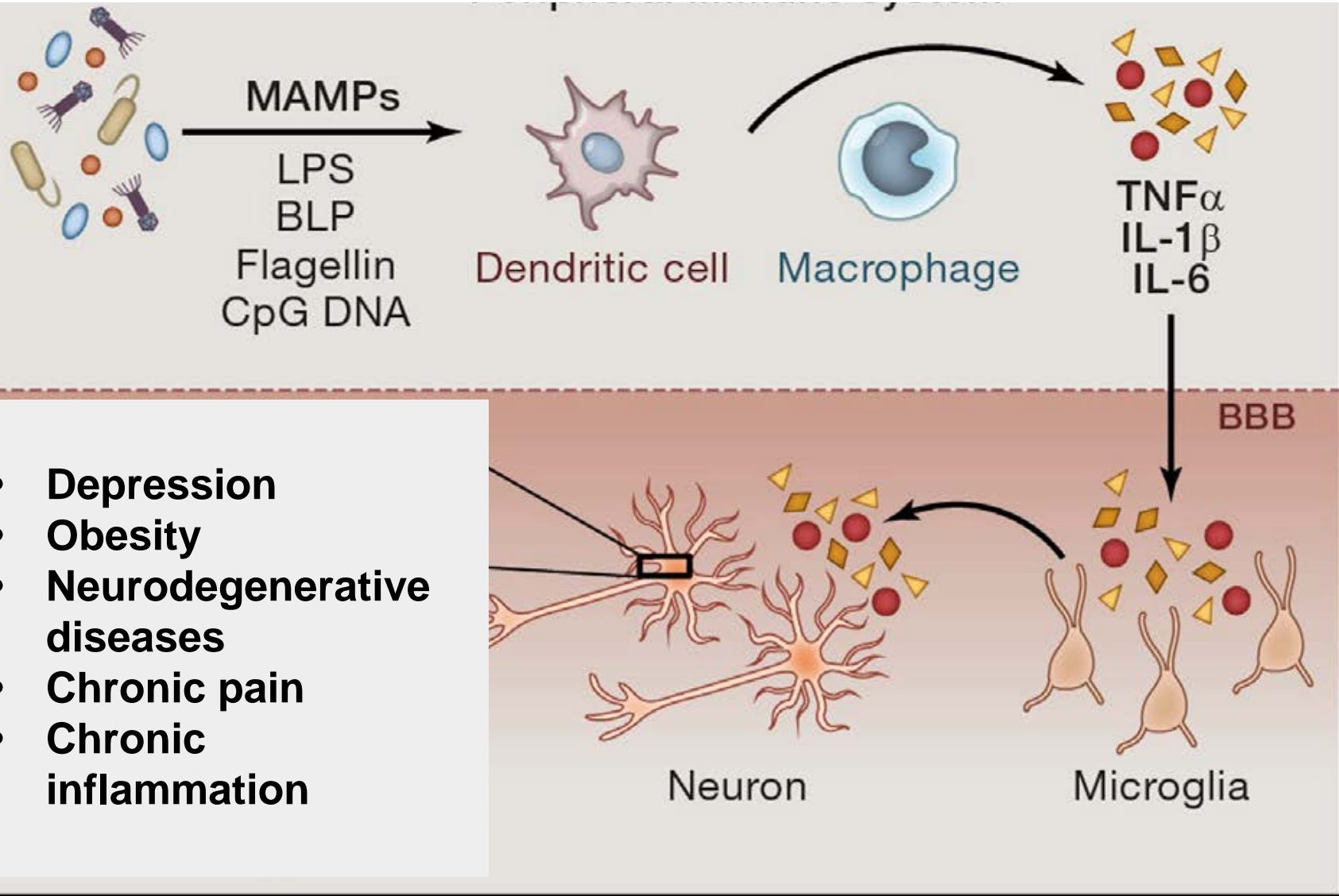
Patrice D. Cani and Amandine Everard

Metabolism and Nutrition Research Group, WELBIO- Walloon Excellence in Life Sciences and BIOTEchnology, Louvain Drug Research Institute, Université catholique de Louvain, Brussels, Belgium

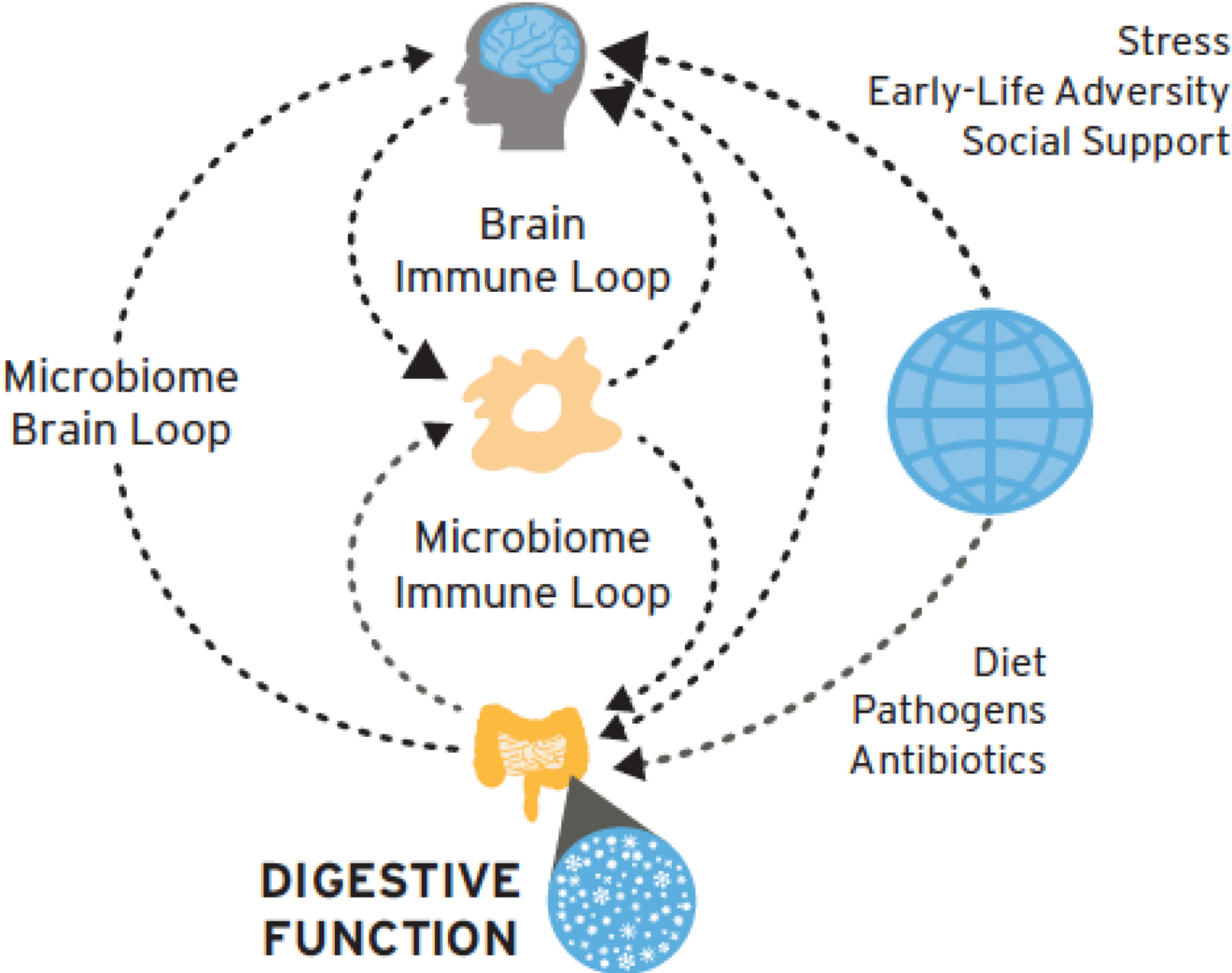
Depression?  
 Anxiety?  
 Food sensitivities?



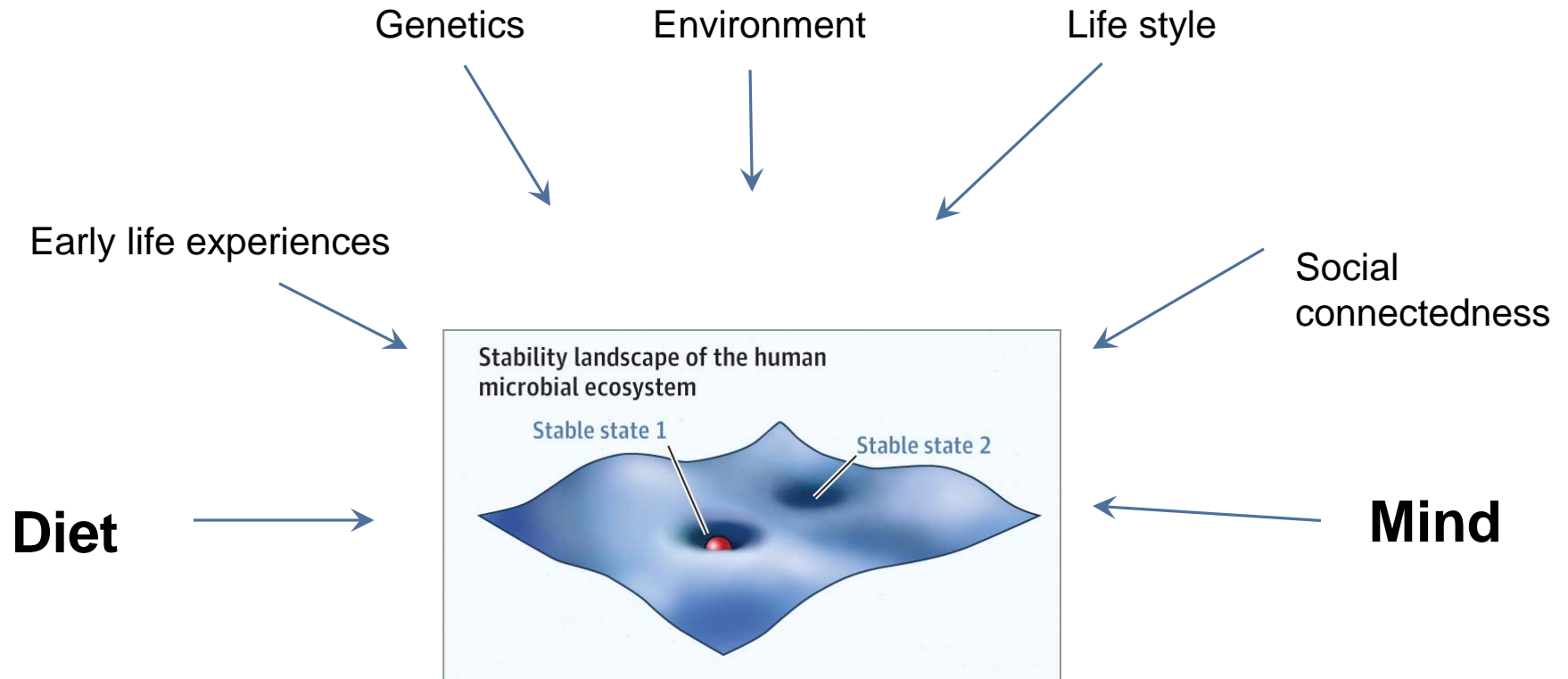
# The Inflamed Brain: Microbiota-related Signaling to the Central Immune System



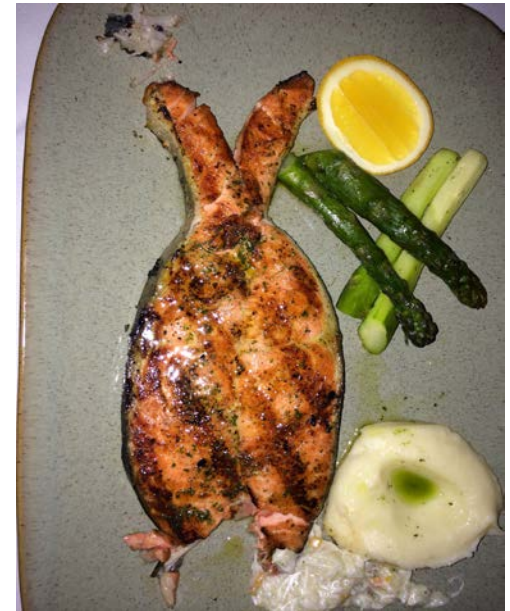
# GUT FEELINGS, EMOTIONS, COGNITIONS



# The New Ecological View of Health and Disease



# Optimal Health



“Complete physical, mental, emotional, spiritual and social well being”

# The Mediterranean Diet Pyramid

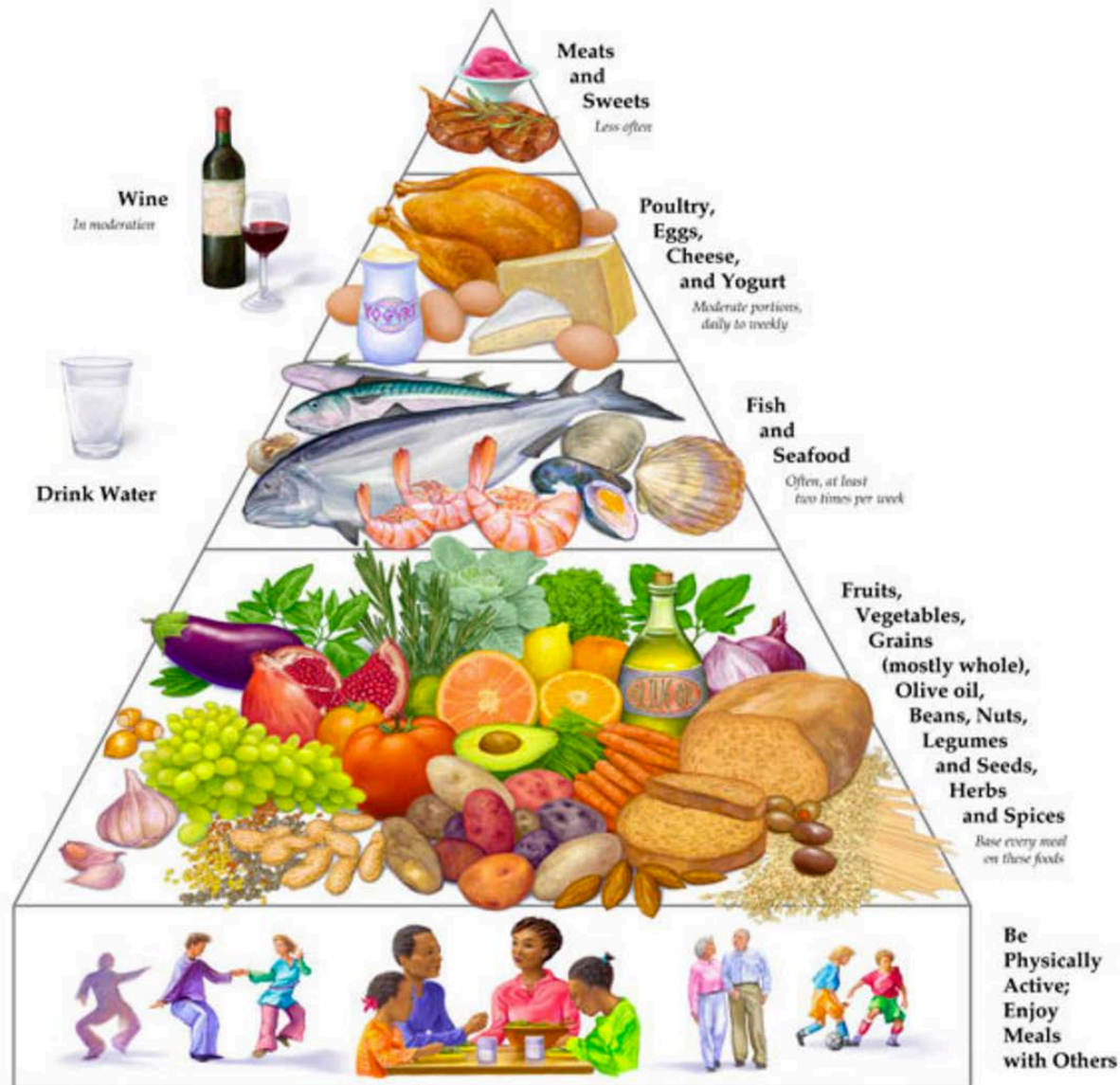


Illustration by George Middleton



# Well Documented Health Benefits of the Mediterranean Diet

Cardiovascular disease

Cancer

Metabolic syndrome

Brain structure and function

Cognitive impairment (Alzheimer's)

Depression

# Why is a Mediterranean Type Diet Good for Your Health?

- **Good for your gut microbes:**
  - High ratio of plant to animal based foods
  - High ratio of plant based (unsaturated fats) to animal based fats
  - Anti inflammatory effects on the gut, brain and body
- High concentration of antioxidants and polyphenols produced by plants for their own protection (olive oil, red wine, roots, leaves) which require the gut microbiota to digest
- Social interactions

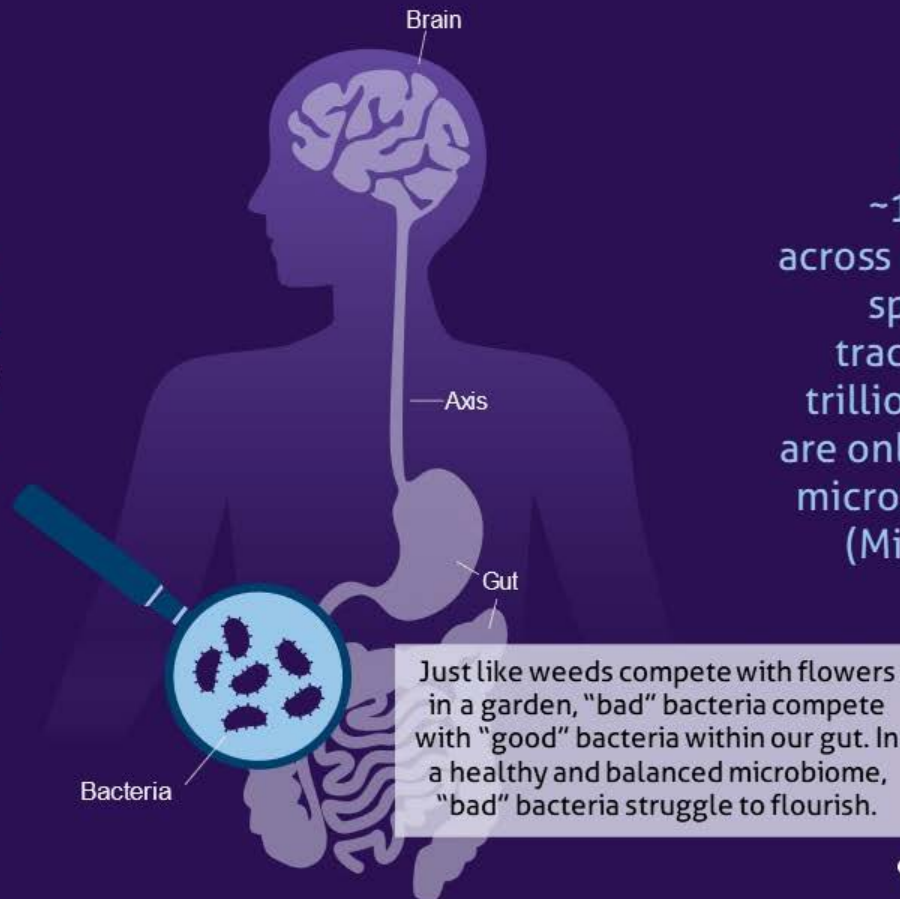


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# HEALTHY GUT HEALTHY MIND

## TWO Brains?

Did you know that we have two brains? One in our head and one in our gut- the **2nd brain**. They are connected by a communication axis. The emerging science of the **Gut-Brain Axis** (GBX) indicates that many mental wellness issues originate as imbalances in the GBX.



## 100% Human

Did you know that we have ~100 trillion microorganisms across more than 10,000 different species (Microbiota) in our GI tract? Compare that to our ~10 trillion human body cells and we are only **10% human!** Those same microbiota have ~9 million genes (Microbiome) compared to our ~23,000 human genes.

Therefore based on gene count, we are **less than 1% human!**



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# BAD vs GOOD

A Balanced Microbiome Supports:

## BACTERIA

### BAD Bacteria

Campylobacter Jejuni & Salmonella Enterica  
– Results in food poisoning and inflammation

Enterococcus Faecium  
– Causes post-surgical infections and inflammatory bowel conditions

Clostridium Difficile  
– Creates effects ranging from diarrhea to life-threatening inflammation

### GOOD Bacteria \*

Lactobacillus Helveticus R0052 \*  
– Improves mood by decreasing neuro-inflammation & increasing serotonin metabolism

Bifidobacterium Longum R0175 \*  
– Enhances calmness by decreasing anxiety indices & enhances cognitive function

Lactobacillus Rhamnosus R0011\*  
– Reduces stress by lowering cortisol exposure & improving GABA neurotransmission



Healthy Inflammatory Balance

Robust Immune Protection



Optimal Digestive Process

\*featured in MentaBiotics™



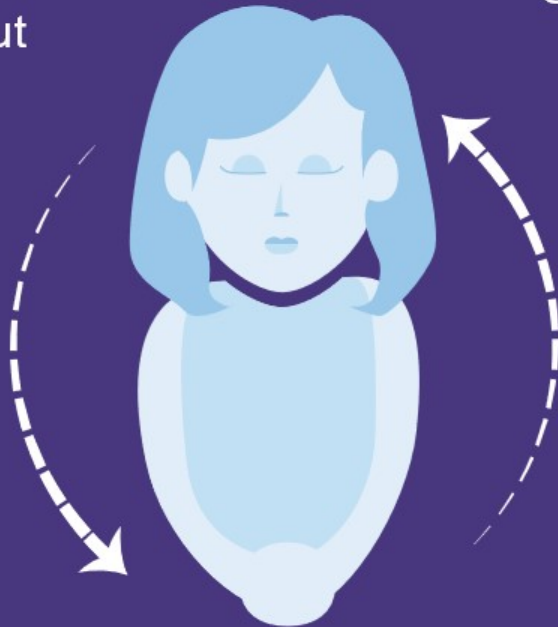
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# IT GOES BOTH WAYS...

## The Brain Can Affect the Gut

## The Gut Can Affect the Brain



"Butterflies in our stomach" form when we're in love or anxious



Fear or sadness makes us "sick to our stomach"



Acute stress can suppress our appetite (short-term), while chronic stress can increase appetite and cravings for comfort foods (stress-eating)



When we eat, receptors in the gut cause the release of enzymes to aid digestion



Gut cells, including microbiome bacteria, send signals to the brain via nerves and hormones to indicate hunger or satiety (fullness)



The gut produces as much as 60%-90% of neurotransmitters involved in mental wellness, including dopamine and serotonin



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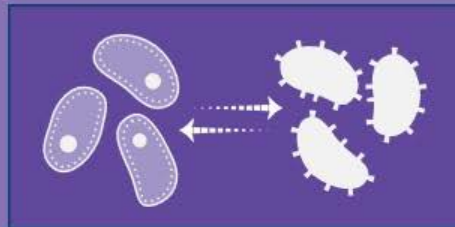
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# THE GUT BRAIN AXIS

The “**Axis**” between the Gut and the Brain coordinates communications



Nerves— such as the vagus nerve, provide a “hard-wired” connection between the gut and the



Cells— including the immune system, interact with the gut microbiota



Biochemicals – including hormones, neurotransmitters, and cytokines transmit signals through the blood stream



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# Balance the GUT with NUTRITION

## PROBIOTICS

Probiotic foods contain live "good bacteria" which support mental wellness and aid digestion. Examples include fermented foods such as yogurt, kefir, kimchi, kombucha, sauerkraut, miso, tempeh, and Probiotic supplements.



## PREBIOTICS

Prebiotic foods contain fibers and carbohydrates that can be fermented and digested by gut bacteria to serve as a fuel source and encourage growth of beneficial bacteria. Examples include asparagus, bananas, green leafy vegetables, garlic, leeks, onions, chicory, ginger, and Prebiotic supplements.



## PHYTOBIOTICS

Phytobiotic foods are rich in flavonoids which protect good bacteria and establish a hospitable environment for the growth of good and displacement of bad bacteria. Examples include apples, grapes, dark chocolate, and berries.



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# Balance the MIND with LIFESTYLE Choices

Take time for a  
**MIND BREAK**

## Sleep

Inadequate or poor quality sleep increases stress hormone exposure (cortisol) and interferes with mood and mental function

Take time to  
**MOVE**



z  
z  
z



## Mindfulness

Practice such as meditation, yoga, gratitude, and mindful breathing reduce stress and anxiety

Take time to  
**SLEEP**

## Physical Activity

Regular exercise is shown to reduce stress, anxiety, and depression as effectively as antidepressant drugs



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# IS YOUR GUT HEALTHY?

## HEALTHY STATUS

- Normal behavior, cognition function, and emotional state
- Healthy levels of inflammatory cells and/or mediators
- Healthy gut microbiota

## UNHEALTHY STATUS

- Alterations in behavior, cognition, emotion, nociception
- Altered levels of inflammatory cells and/or mediators
- Intestinal dysbiosis



# INTRODUCING AMARE GLOBAL PRODUCTS





Amare's flagship product line features our most popular cornerstone products! The products are designed to improve every aspect of the gut-brain axis for optimal mental wellness.\*

## FUNDAMENTALS™



\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

# amare FUNDAMENTALS PACK™ CLINICAL STUDY

The Amare FundaMentals Pack has been clinically proven to:

Increase GOOD Bacteria in the Gut

=

INCREDIBLE BENEFITS!

28% higher Lactobacillus

30% higher Bifidobacterium

17% higher overall composite score†

which leads to...

Lower *tension* by 45%\*

Lower *depression* by 55%\*

Lower *anger* by 54%\*

Lower *fatigue* by 64%\*

Lower *confusion* by 43%\*

Higher *vigor* by 44%\*

after 30 days, when compared to the placebo group

†The composite score is an overall average of many different aspects of microbiome balance, including Bifidobacterium, Lactobacillus, Akkermansia, Firmicutes/Bacteroidetes (F/B) ratio, and others.



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# menta BIOTICS™

advanced gut-brain  
nutrition\*

The most comprehensive combination of unique strains of probiotics, prebiotics, and phytobiotics that have been scientifically shown to improve mental wellness.\*

AMARE'S  
FLAGSHIP  
PRODUCT

SUPPORTS  
FEEL-GOOD  
NEUROTRANS-  
MITTERS

INCREASES  
GOOD  
BACTERIA



<b>Item Code:</b>	S001
<b>Retail Price:</b>	\$100.00
<b>Wholesale Price:</b>	\$74.95 / 65 PV
<b>Subscribe &amp; Save:</b>	\$66.95 / 58 PV

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dobacterium

# FOR YOUR GUT...

## THE PROBIOTIC STRAIN MATTERS



### ***Lactobacillus rhamnosus R0011:***

Reduces stress by lowering cortisol exposure and improves GABA neurotransmission\*



### ***Bifidobacterium longum R0175:***

Enhances calmness by decreasing anxiety indices and improves cognitive function\*



### ***Lactobacillus helveticus R0052:***

Improves mood by decreasing neuro-inflammation and increasing serotonin\*

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# Probiotic Strains

## **Bifidobacterium bifidum (Bb-06)**

- Maintains microflora balance by producing lactic acid and acetic acid to compete with “bad” bacteria (Staph. aureus, E. coli, Campylobacter jejuni, etc).

## **Bifidobacterium longum (Bl-05)**

- Highly resistant to low pH and bile salts and is well-suited to the intestinal environment to help reduce inflammation. Helps reduce gastrointestinal discomfort caused by stress.

## **Lactobacillus acidophilus (La-14)**

- Ferments carbohydrates to lactic acid, which competes with “bad” bacteria for adhesion spaces on the intestinal mucosa. Increases mineral bioavailability (incl copper, magnesium, calcium, and manganese).

## **Lactobacillus casei (LC-11)**

- Wide range of benefits for improved digestion, reduced cholesterol, modulation of inflammation/allergies.

## **Lactobacillus rhamnosus (Lr-32)**

- Promotes general GI health and function – especially beneficial to prevent/treat occasional diarrhea and constipation after probiotic treatment.

# GBX+ proprietary blend...

Patent Pending and Exclusive to Amare



## ***Applephenon: Asian Apple Fruit extract***

Supports gut health, immune function, & inflammatory balance\*



## ***Enovita: French Grape Seed extract***

Enhances blood flow, cardiovascular tone, & cellular defenses\*



## ***Enzogenol: New Zealand Pine Bark extract***

Improves neurotransmitter balance, mental focus, & psychological vigor\*

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# WOULD YOU...

Feed a lion grass?

OR

Feed an elephant meat?



My own “Mental Wellness Diet” (MWdiet for short) is a super-charged version of the Mediterranean diet that addresses the 3 primary anti-depression factors:

1. Brain Nutrients (Vitamin B6, Omega-3 fats, Flavonoids, Tocotrienols)
2. Inflammation
3. Microbiome

### **DocTalbot's MWdiet Shopping List**

#### **Fresh Fruits & Vegetables**

- Unlimited amounts – choose brighter options grown as close to home as possible
- Spinach
- Kale
- Cabbage
- Sweet potatoes
- Tomatoes
- Onions
- Leeks
- Garlic
- Asparagus
- Artichokes
- Peas (frozen is OK)
- Bananas
- Berries (frozen is OK)
- Pomegranates
- Apples
- Grapes (including red wine, in moderation)

#### **Beans & Legumes** (canned is OK)

- Black beans
- Kidney beans
- Garbanzo (Chickpeas)
- Lentils

#### **Healthy Fats**

- Extra Virgin Olive Oil
- Nuts – Cashews, Walnuts, Almonds, Macadamias, Pistachios
- Avocados

#### **Whole Grains**

- Oats/Oatmeal
- Whole Grain Pasta
- Quinoa
- Brown Rice

#### **Dairy, Cheese, and Fermented Foods**

- Greek Yogurt, Icelandic Skyr, or other yogurt (look for lower sugar and higher fat content)
- Whole Organic Milk
- Kefir
- Kombucha (fermented tea)
- Cheeses of your choice (in moderation)
- Sauerkraut (and other fermented veggies such as cucumbers/pickles, beets, carrots, turnips)

#### **Proteins**

- Salmon
- Chicken
- Eggs
- Shrimp (frozen is OK)
- Lean Pork
- Lean Beef (in moderation)

#### **Herbs & Spices**

- Turmeric
- Ginger
- Basil
- Rosemary
- Oregano
- Clove
- Sage
- Cayenne
- Parsley
- Thyme
- Saffron
- Cumin
- Coriander
- Paprika
- Cinnamon
- Allspice
- Nutmeg

