

The Surprising Gut-Brain Connection & How To Have a Healthy Gut

Dr. Marc Milstein

www.drmarcmilstein.com

Do You Crave Chocolate?



Does Tylenol
Work On
You?



What Makes Us Different? (Chocolate, Medications)



Is It Our Genes?

How similar?



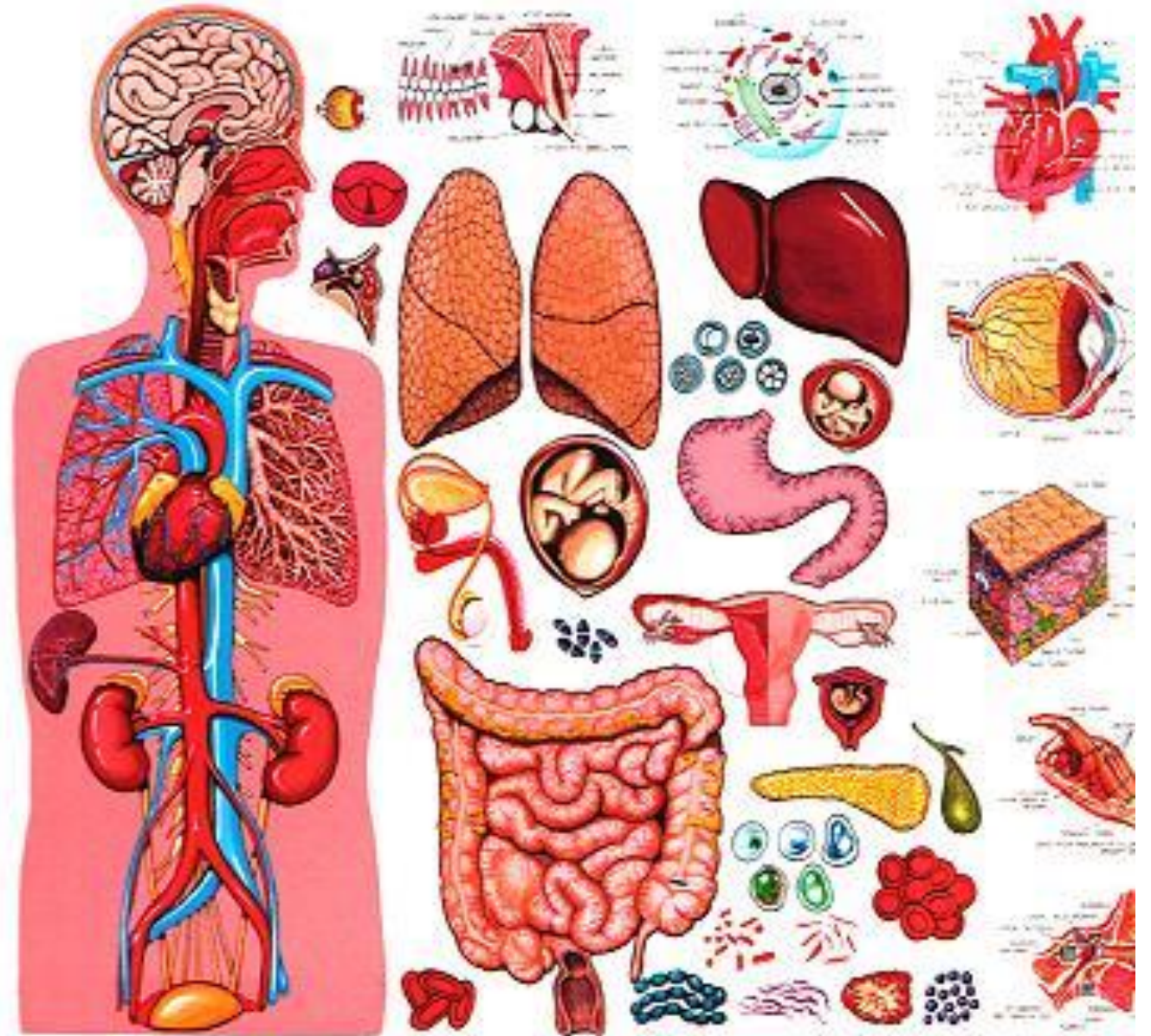


Bacteria Makes Us Different

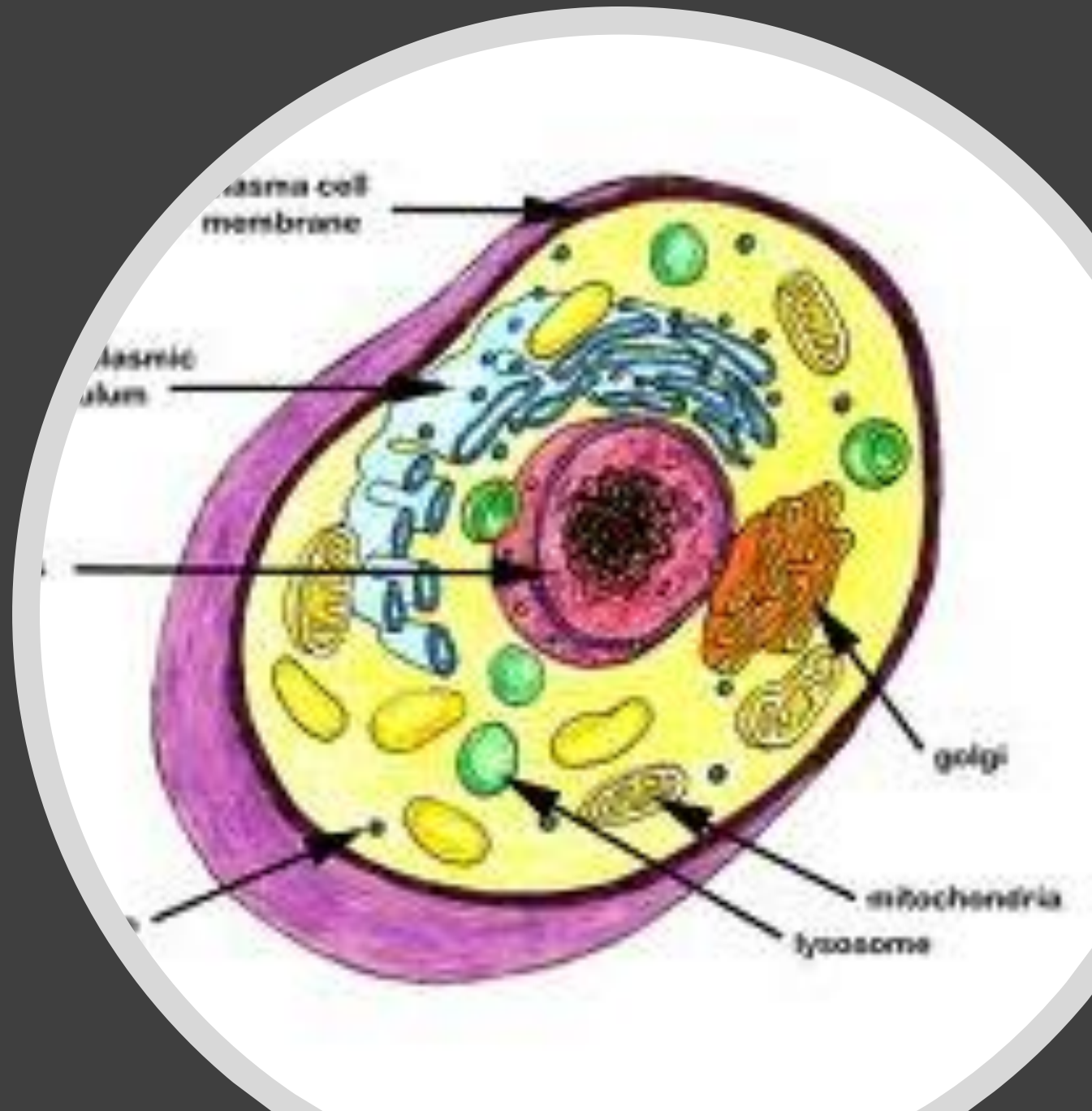
**Bacteria Forces
Us To
Re-examine
Who We Are....**

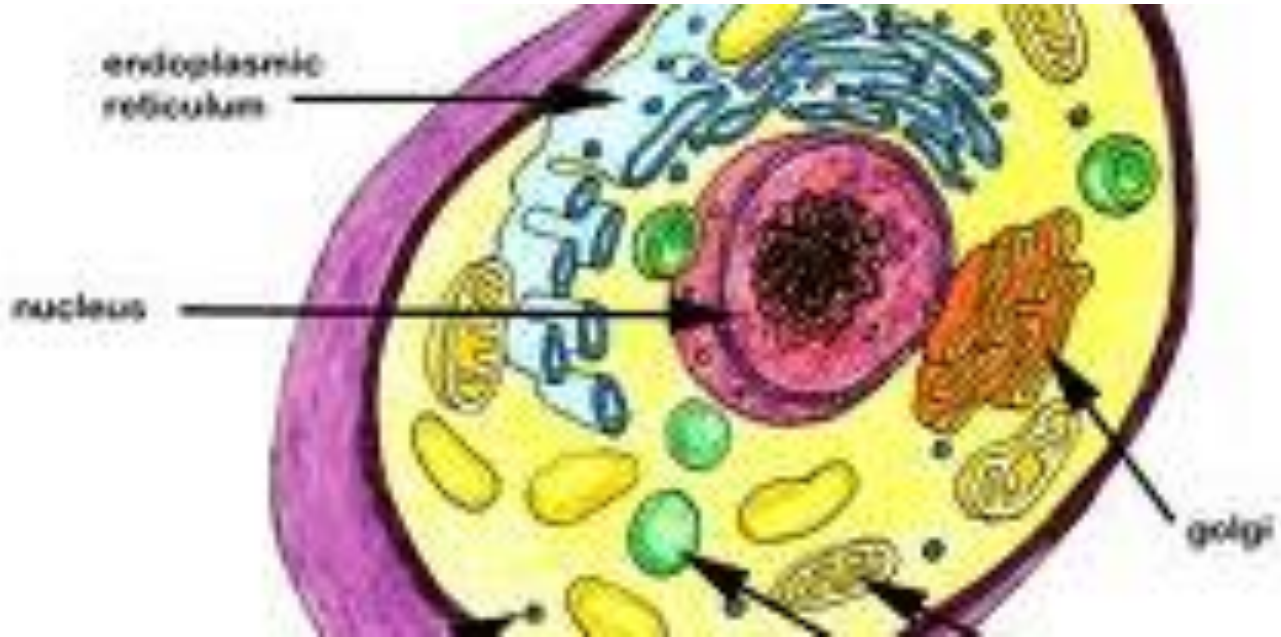


Human Cells In Different Organs...



**How Many
Human Cells Are
In Your Body?**





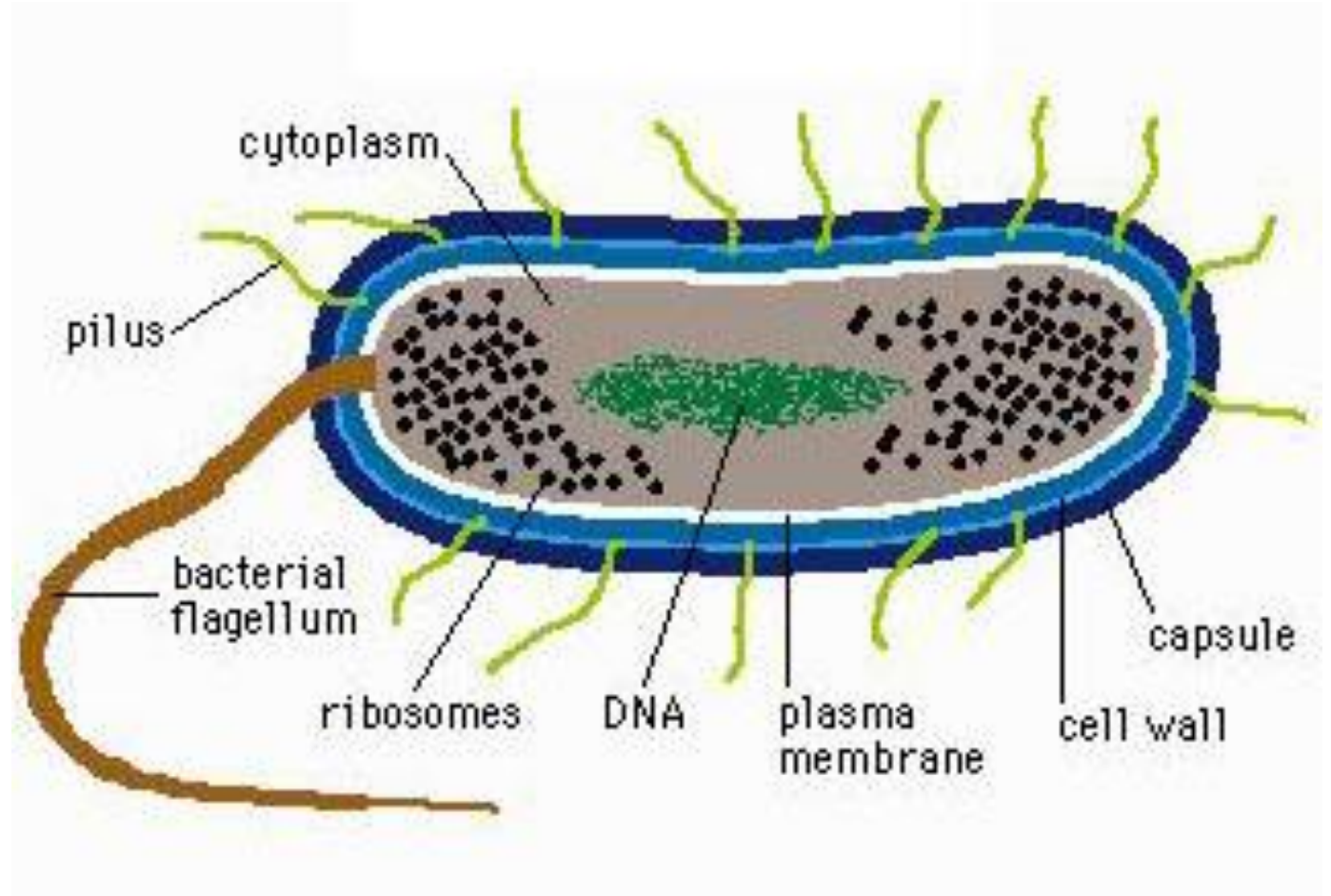
About 37 Trillion Cells!

Who Counted?



Over A Million Years....

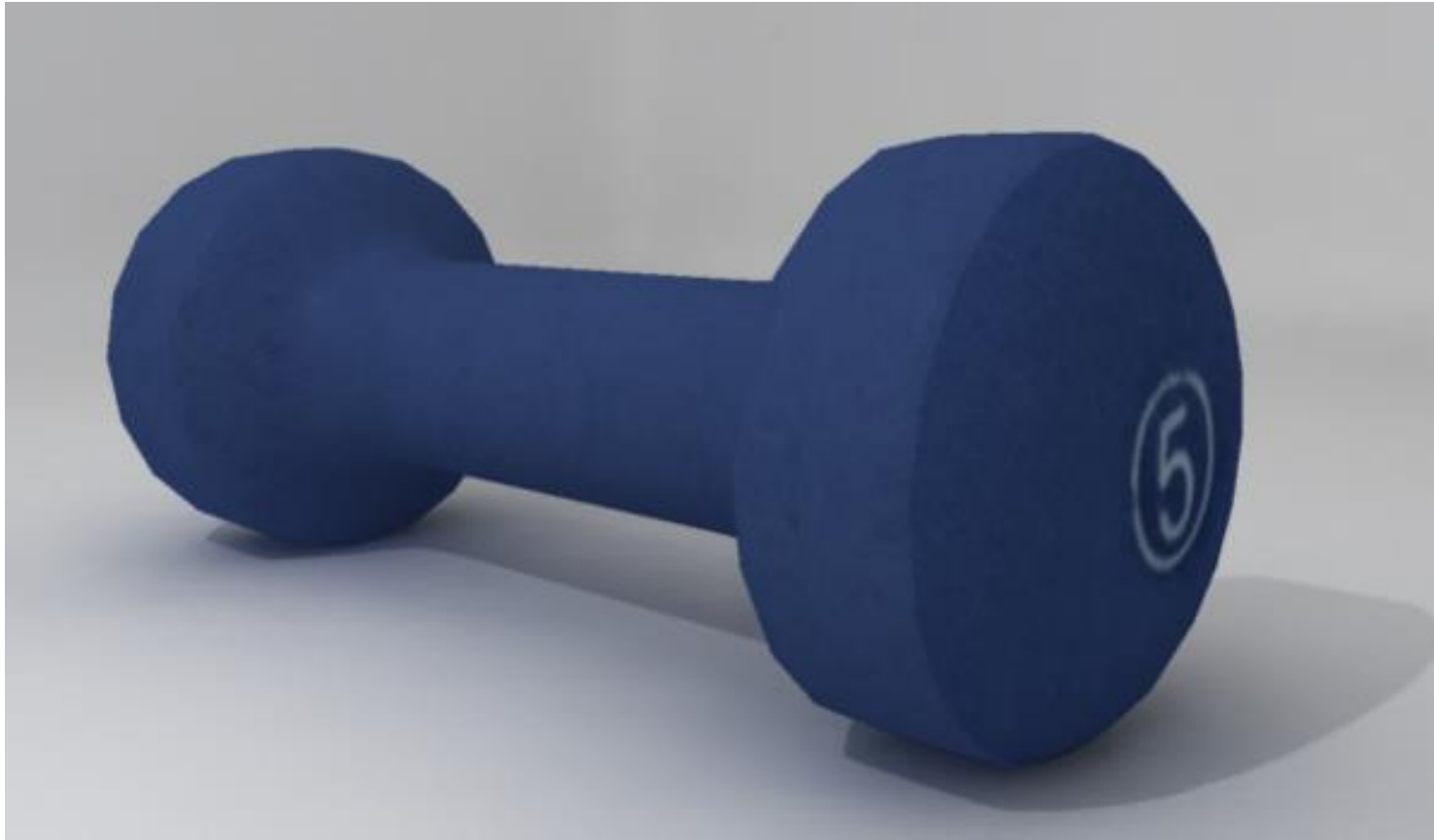
How Many Bacteria Cells Are In The Human Body?



About Equal Bacteria Cells and Human Cells!



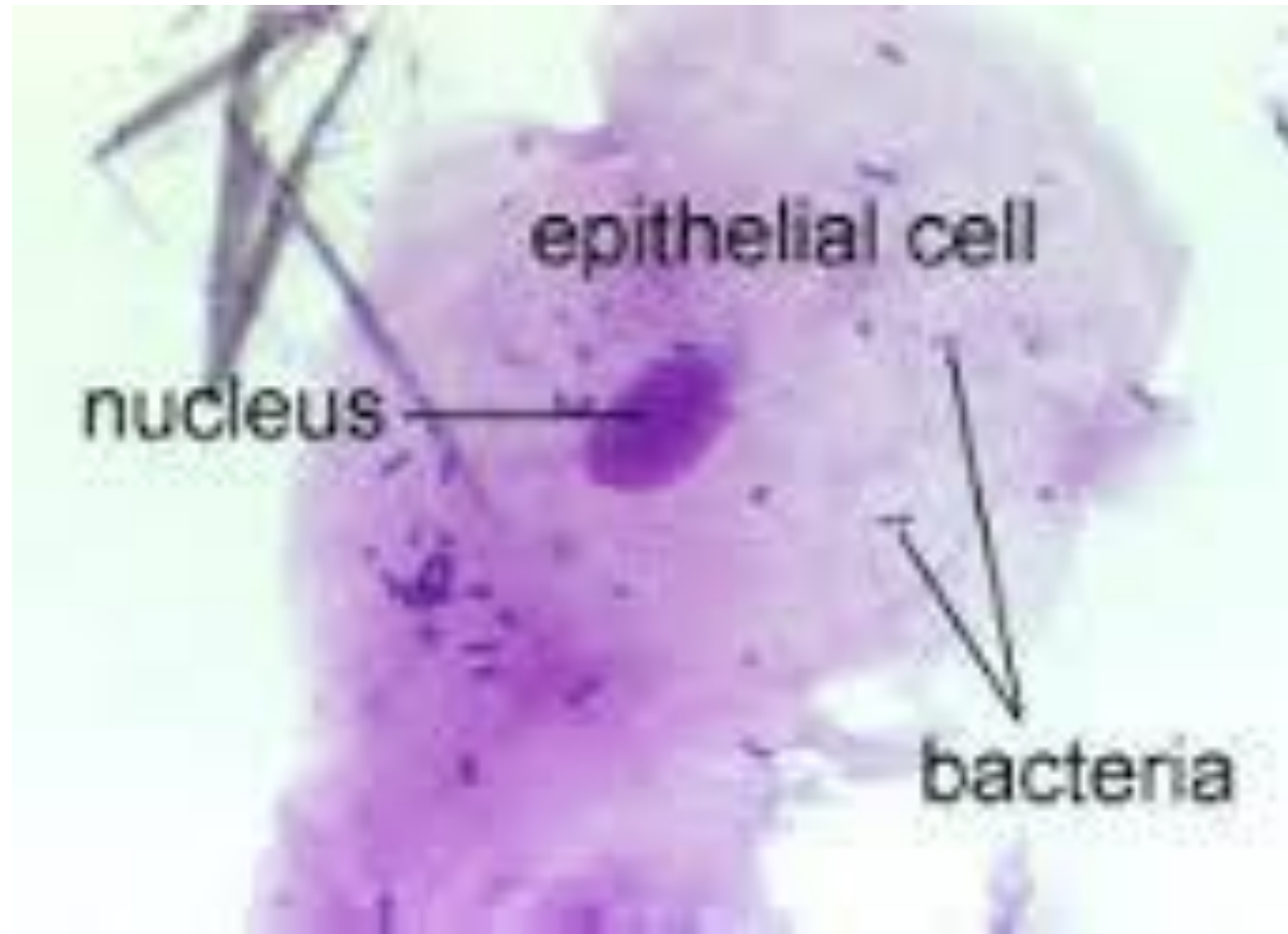
- So, about 40 trillion bacterial cells in your body.



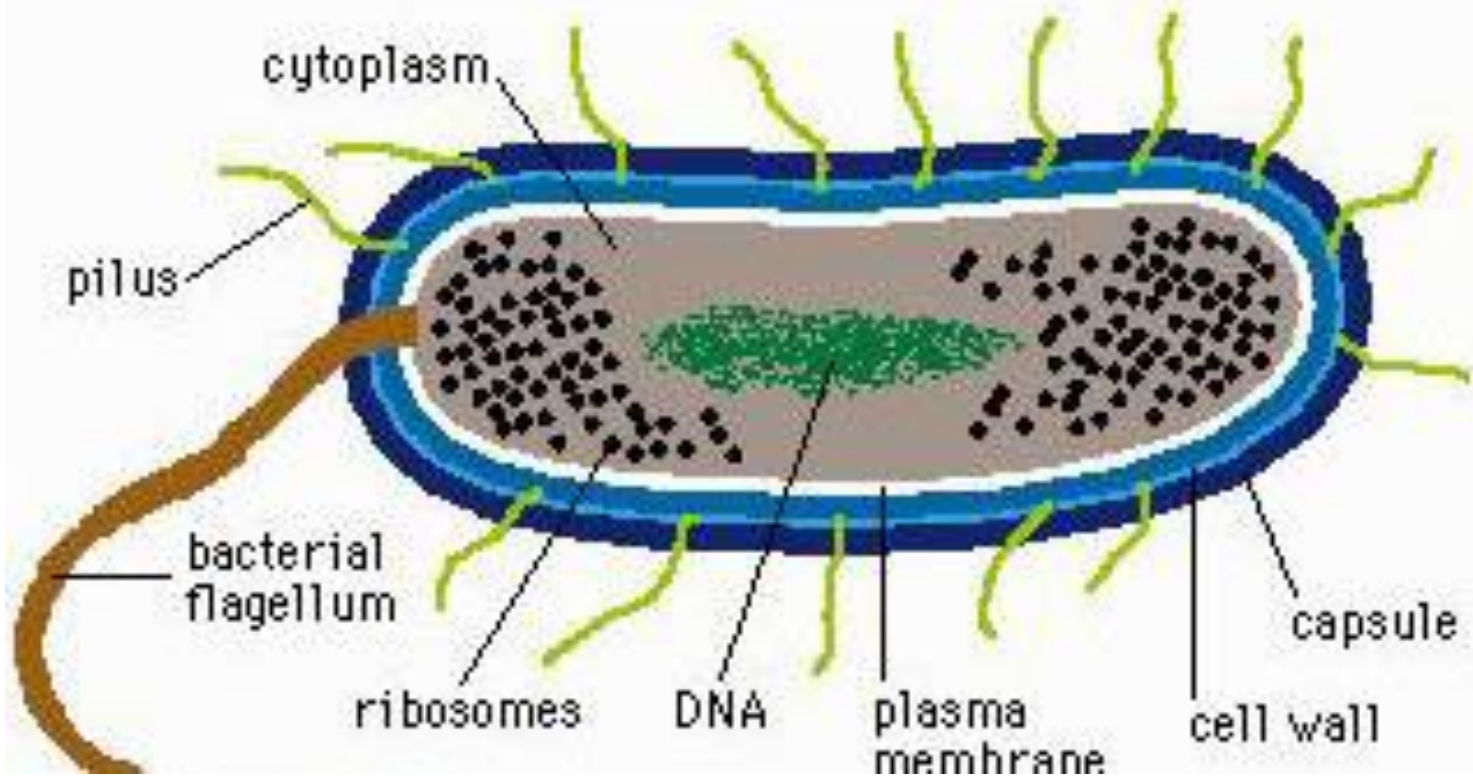
**The Average Person Is Three to
Six Pounds Of Bacteria
Wait!!! What????**

How does that
add up to just
five pounds?

Bacteria Cells vs. Human Cells

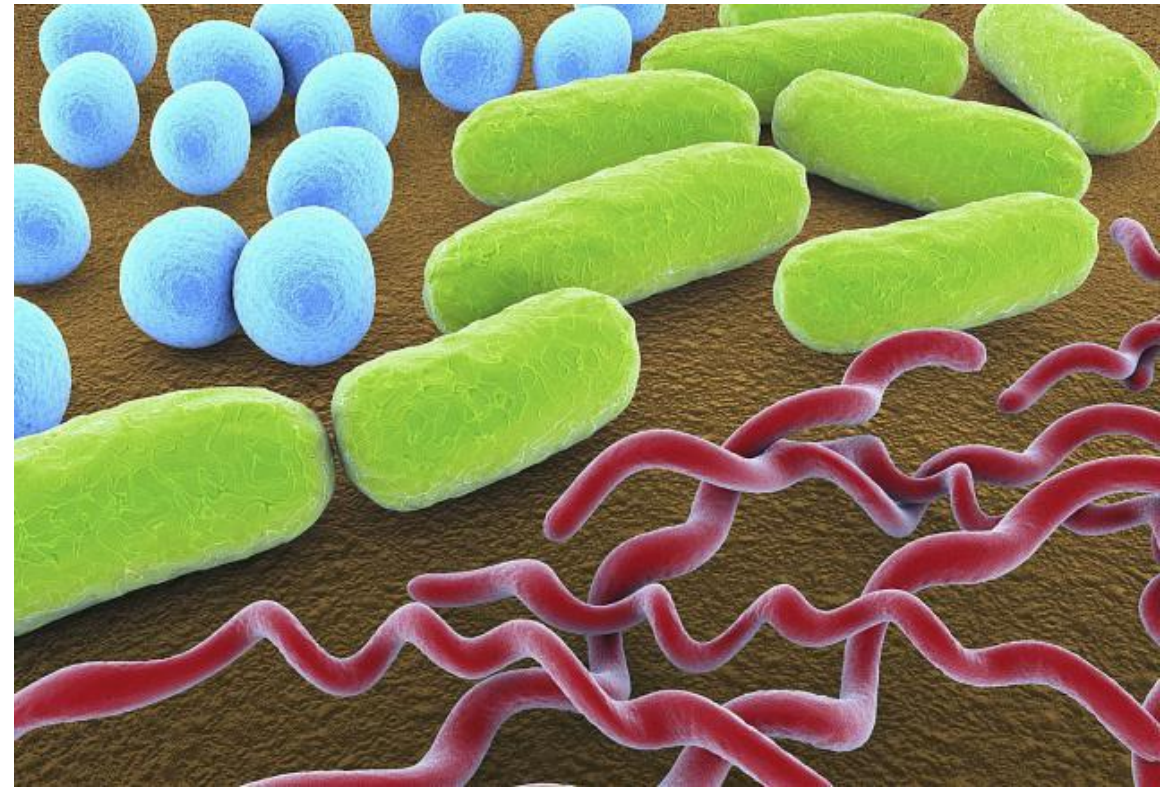
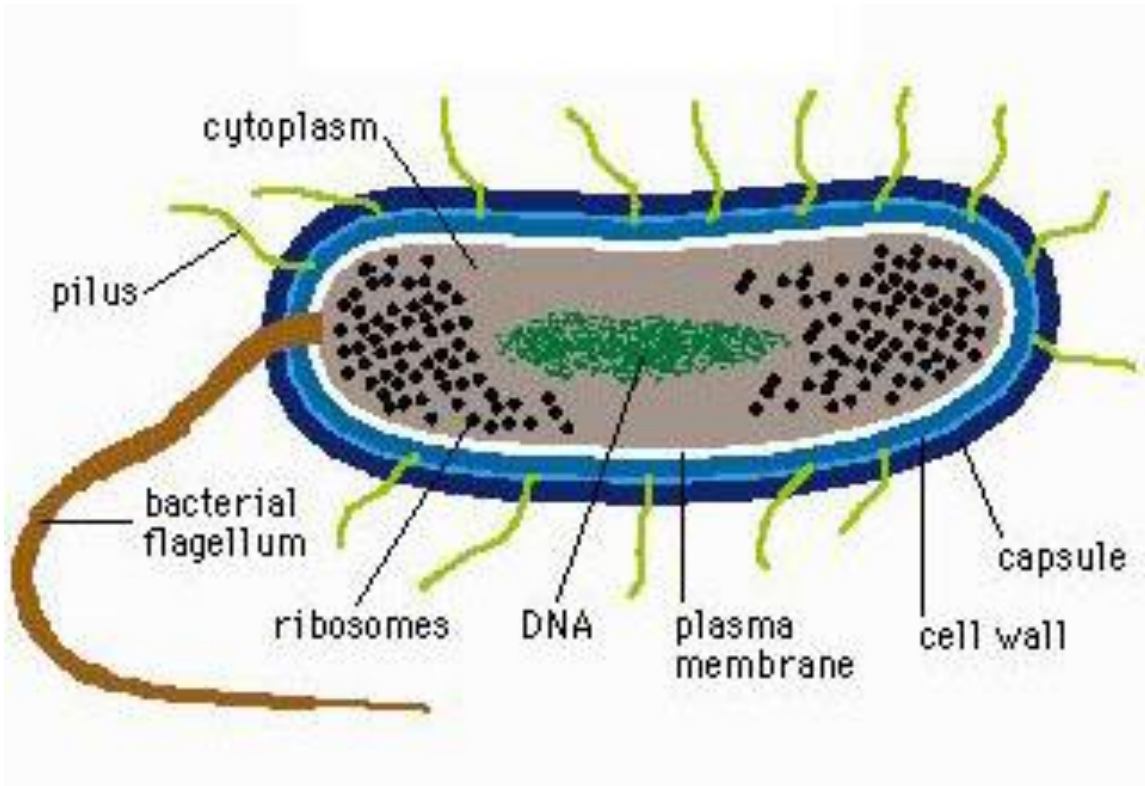


Bacteria cells are tiny — one-tenth to one-hundredth the size of a human cell.



What Is All This Bacteria Doing?

- Are they passive riders?
- What are we starting to understand?
- The IMPACT on our health and our brains....

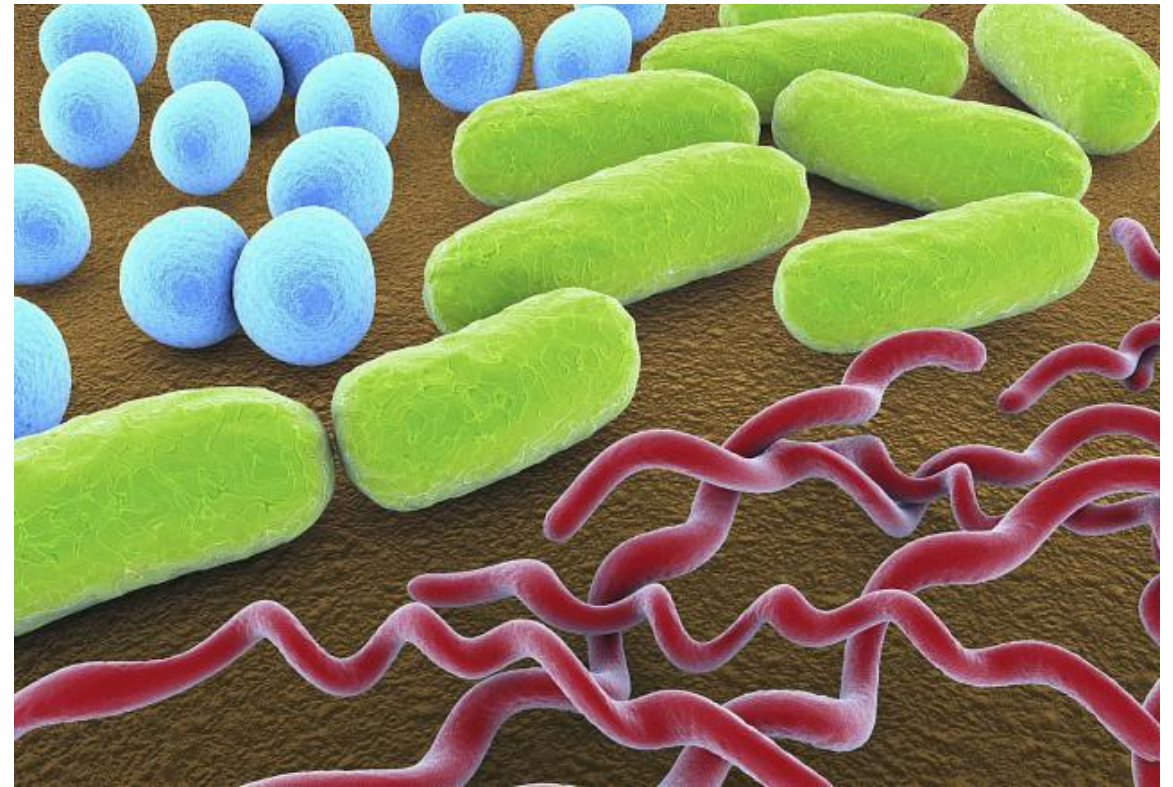
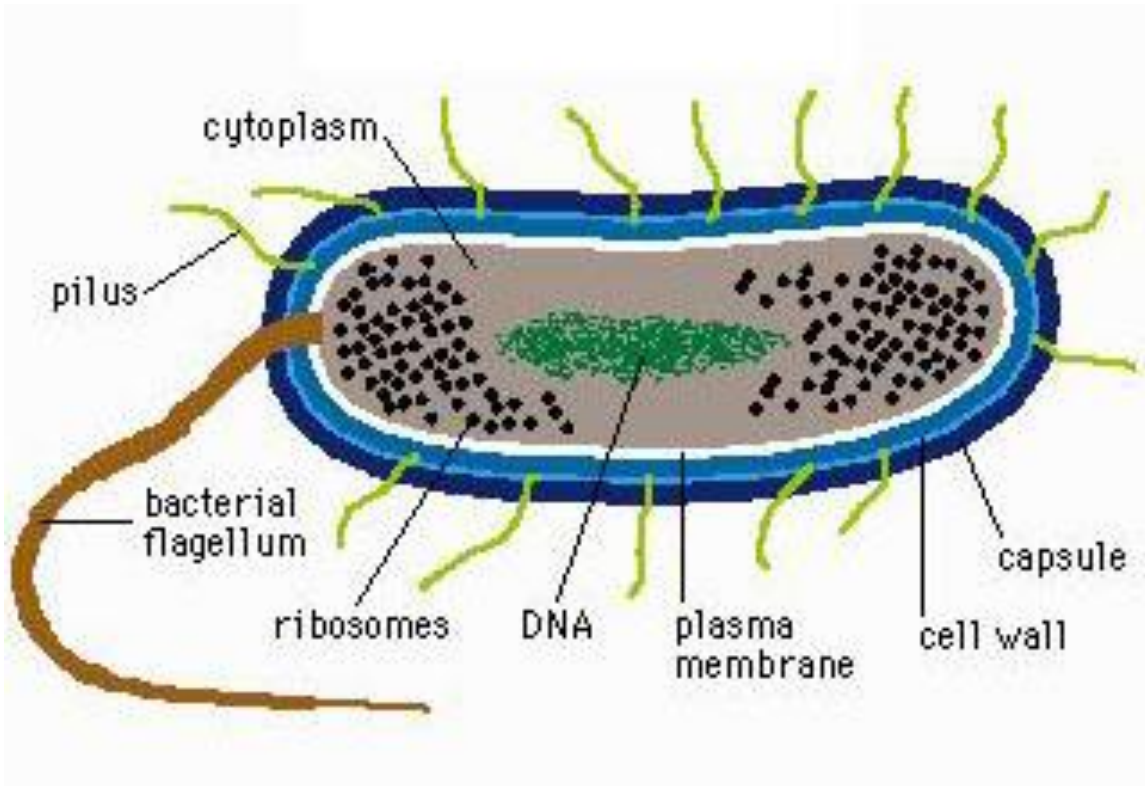


**WE NEED TO DO A QUICK REVIEW:
What Is Bacteria?**

30 Seconds of High School Biology On Bacteria

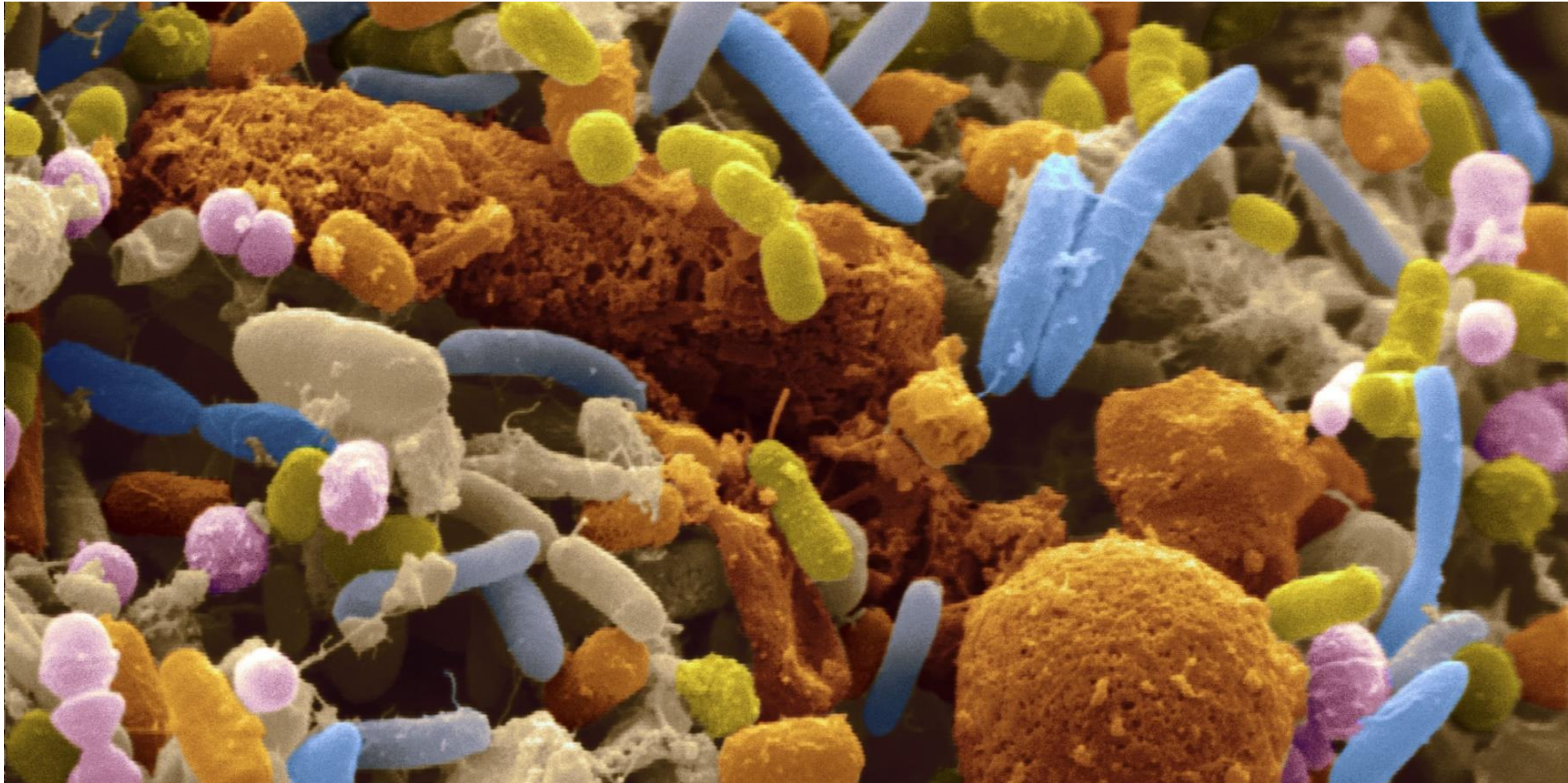


2 Main Points



QUICK REVIEW: What Is Bacteria?

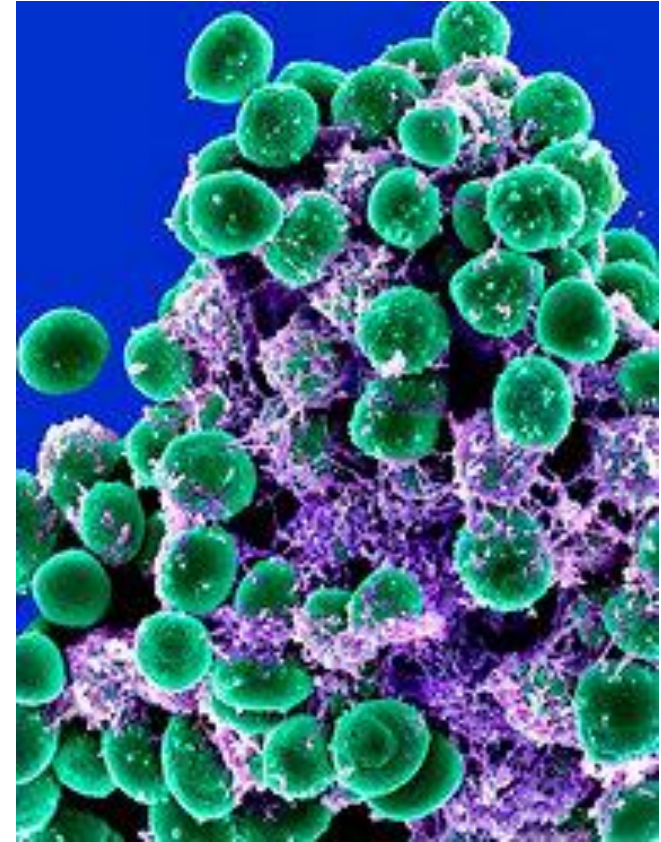
Bacteria Are Everywhere! And They Are Diverse....



Redefine Good vs Bad



Helps Us



Hurts Us

How Long Have Bacteria Been Around?





Bacteria Were Here First!

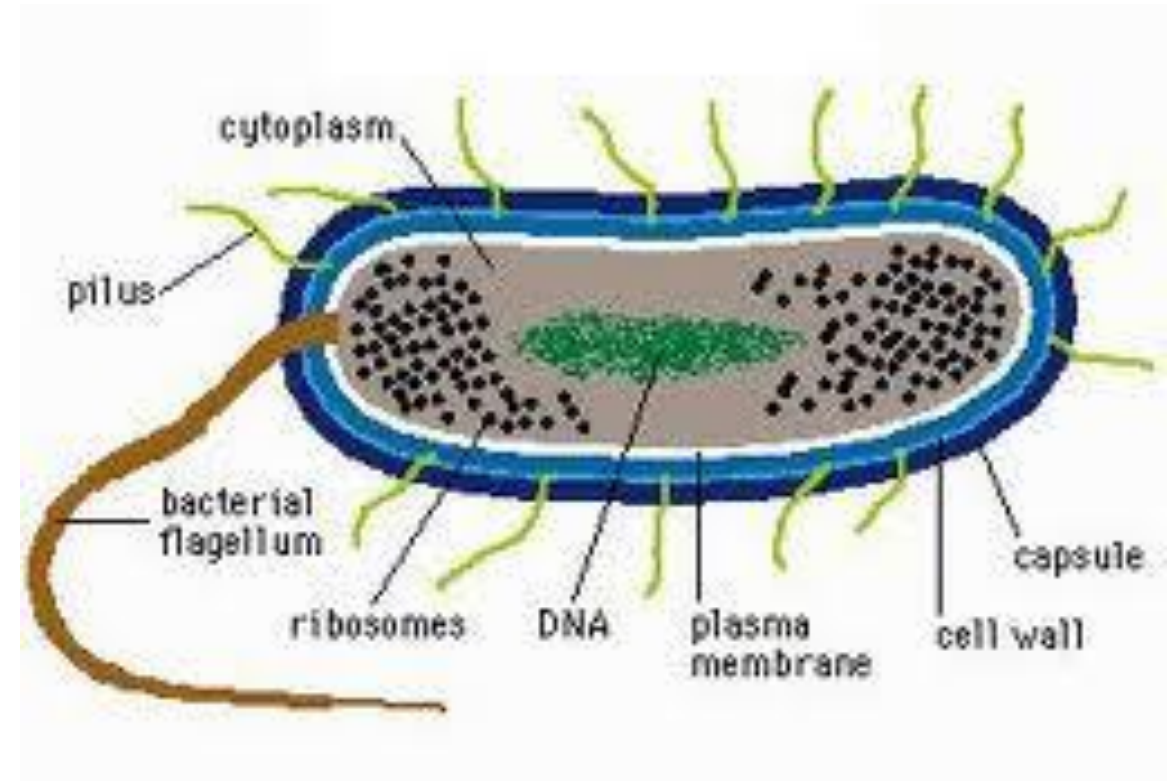
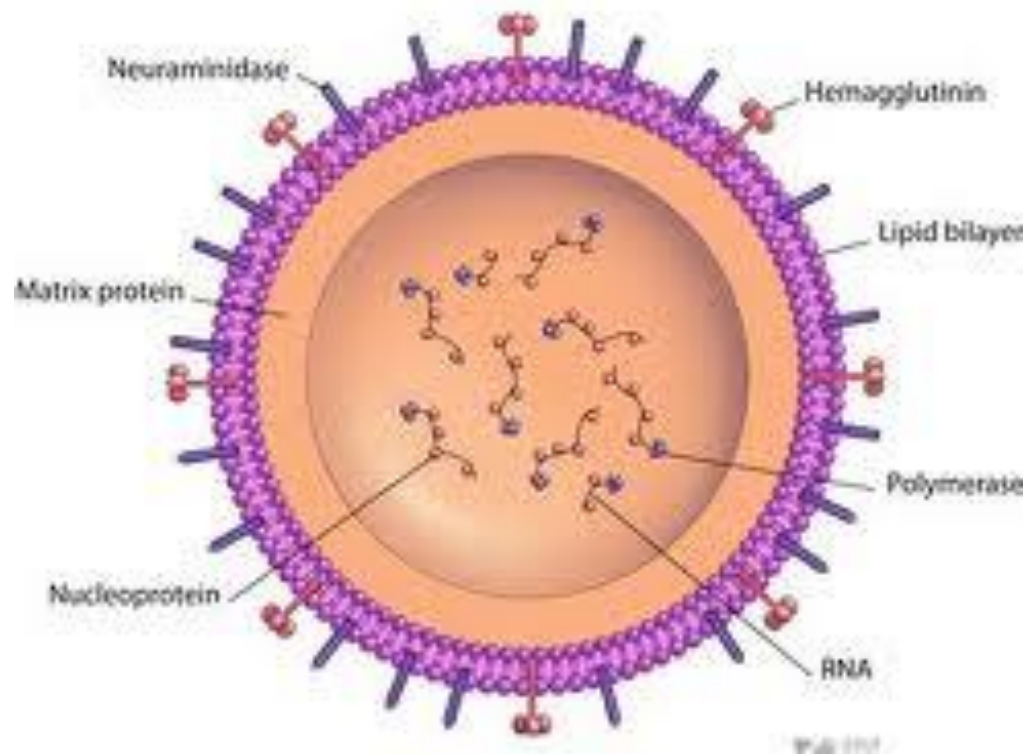
Bacteria arrived about 3.8 billion years ago.
(Around March of last year).

Human like ancestors 6 million years ago.
(Humans got here 30 minutes ago).

What Isn't Bacteria??

Virus vs Bacteria

Influenza Virion



**Back To Our Big
Questions:**

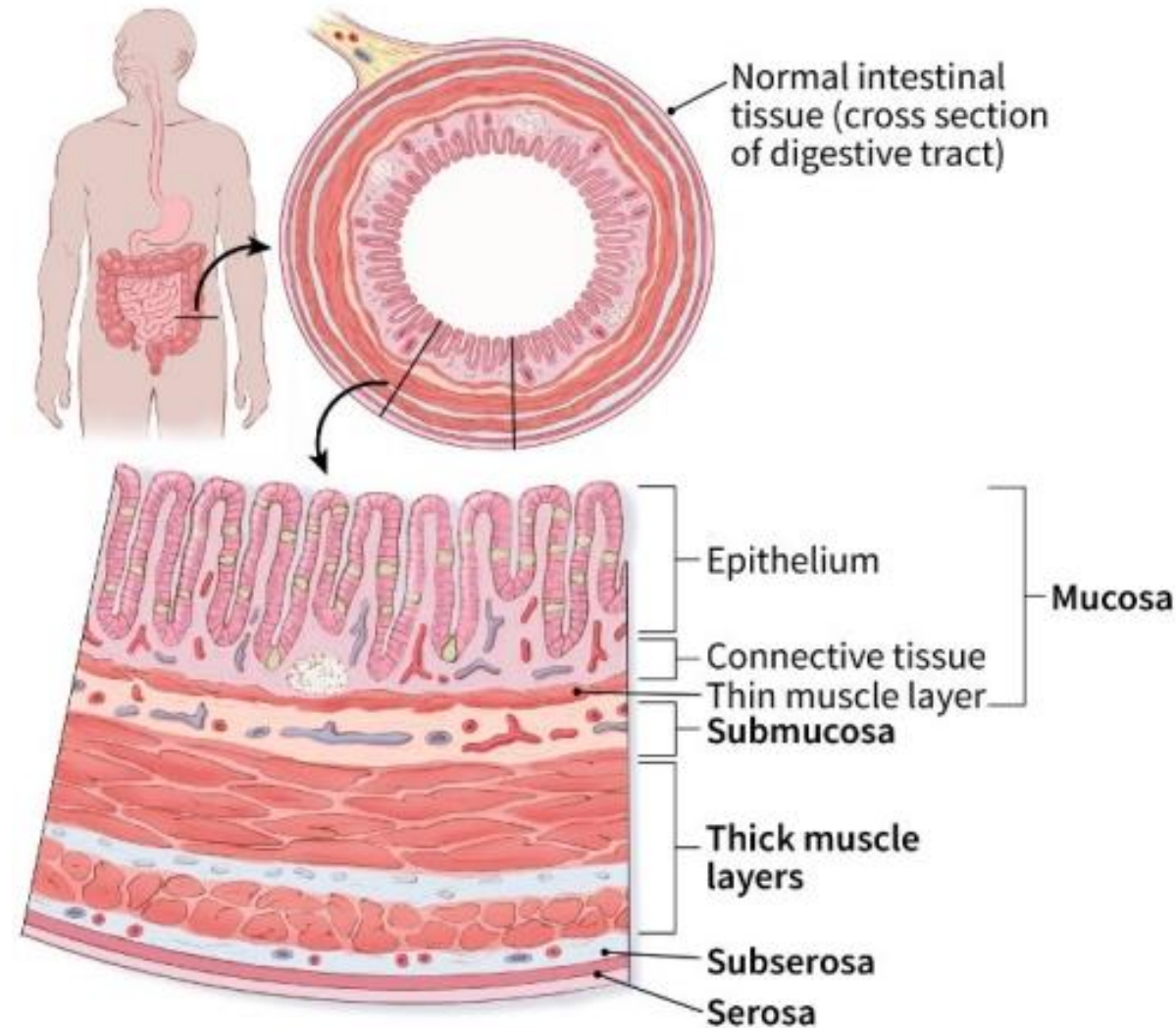
**So What Is All This
Bacteria In Our Bodies
Doing?**

What Is Your Microbiome?

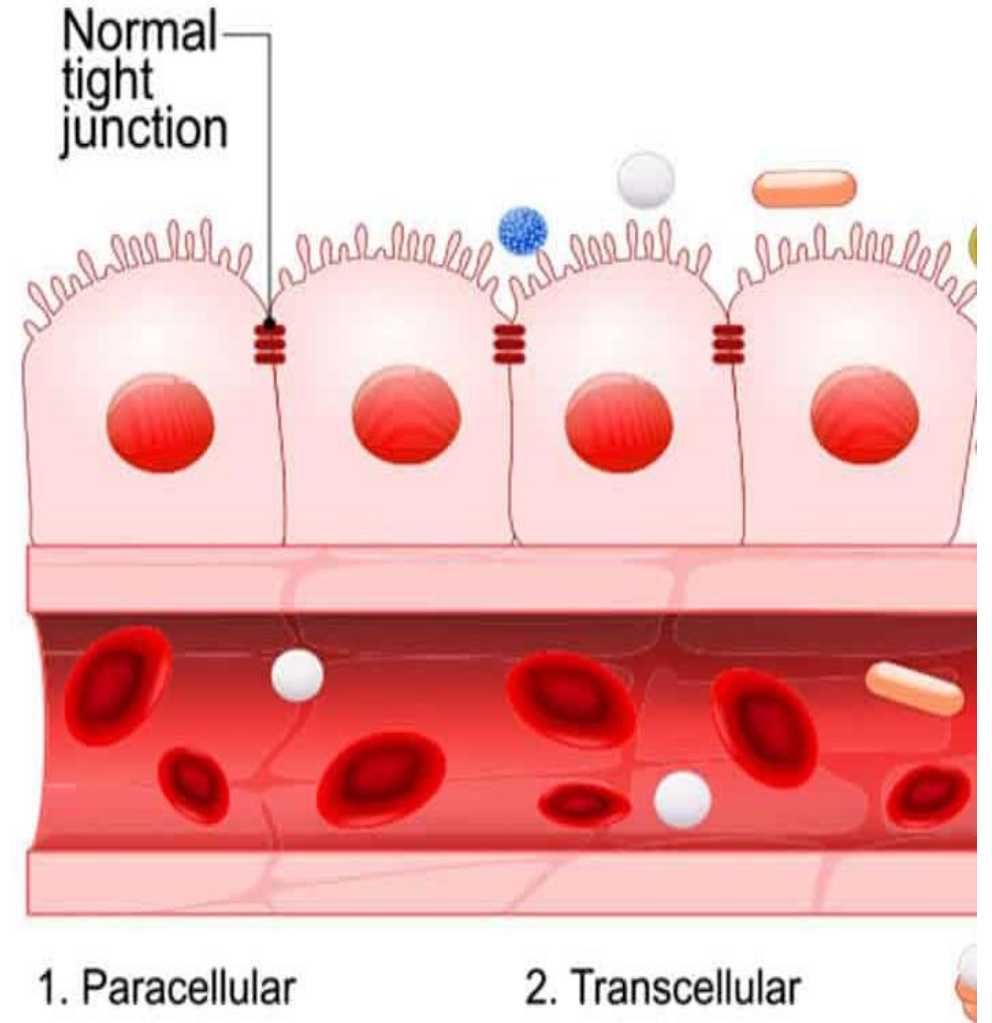


What's Your Agreement With Your Gut Bacteria?

- Provide our gut bacteria with a place to live and nutrients to grow.
- Bacteria help us break down food.
- Bacteria make vitamins for you.



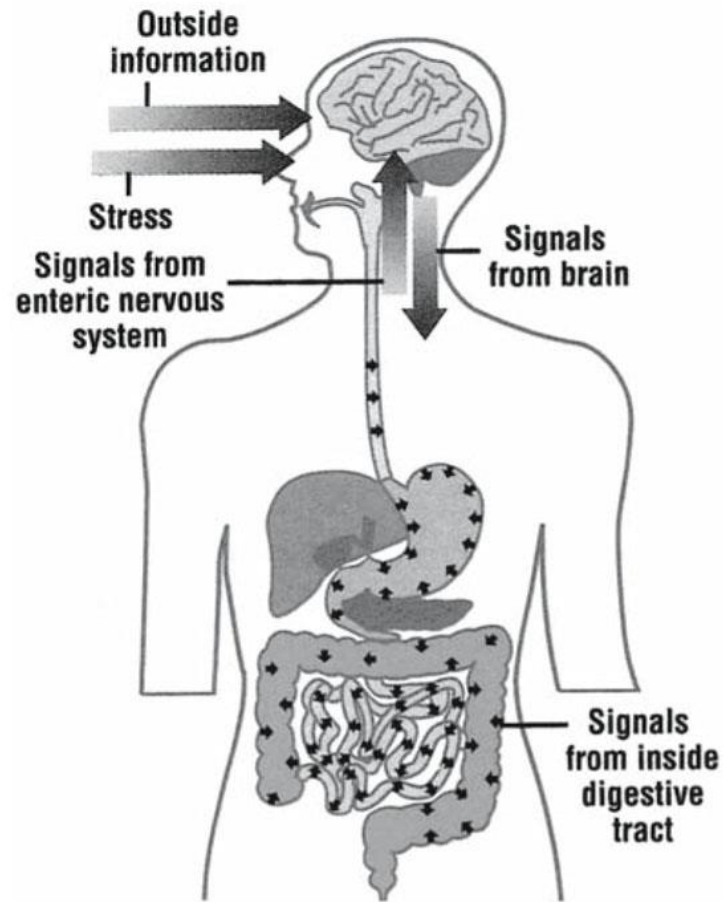
Gut Bacteria Is Like....



**Bacteria Plays
A Role In Why
Some Diets
And Meds
Work On
Some And
Not Others**

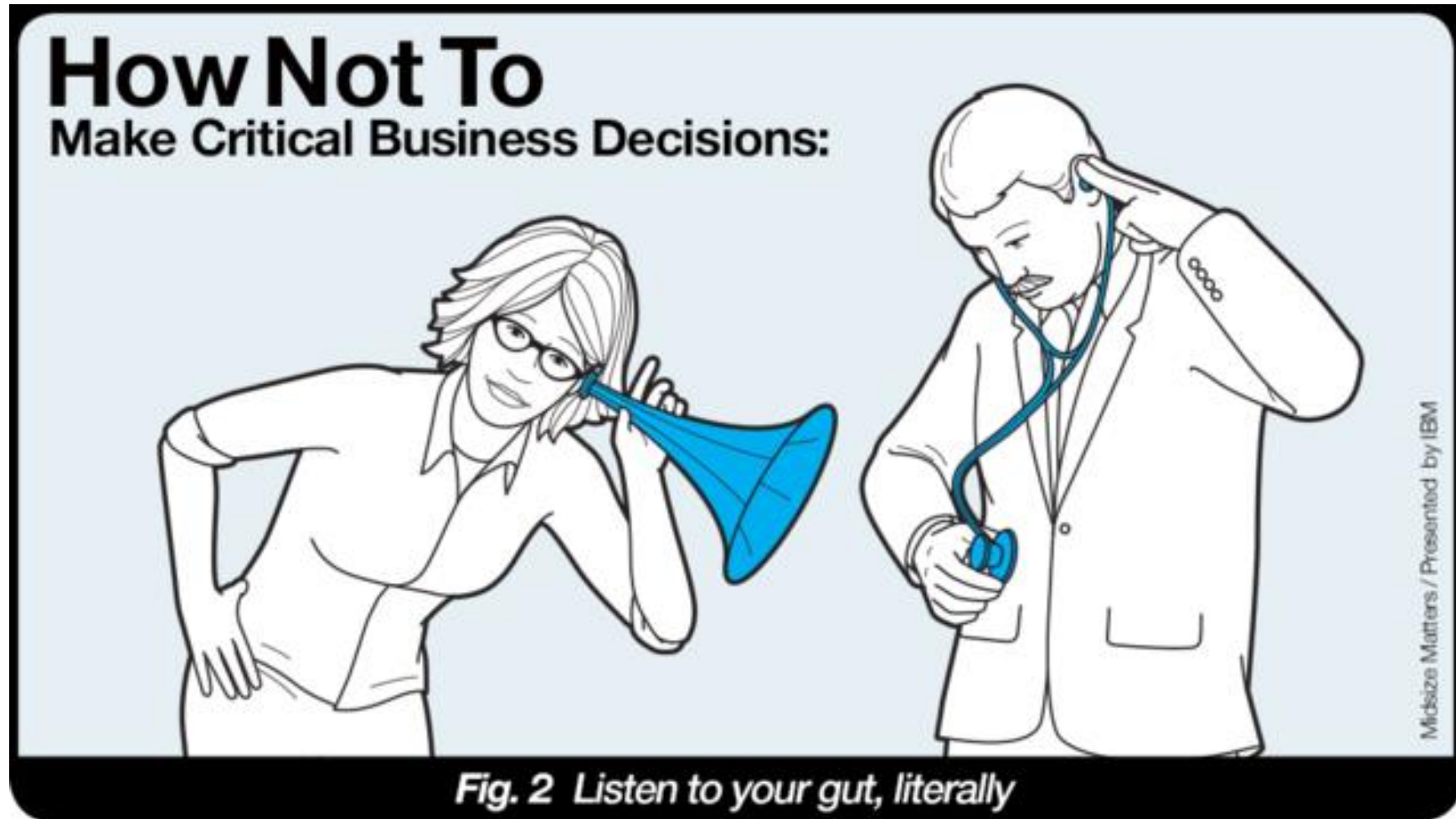


Is There A Gut Brain Connection?



Can Bacteria Impact Your Personality?

Listen To Your Gut, Trust Your Gut?



Mice Can Have Different Personalities....

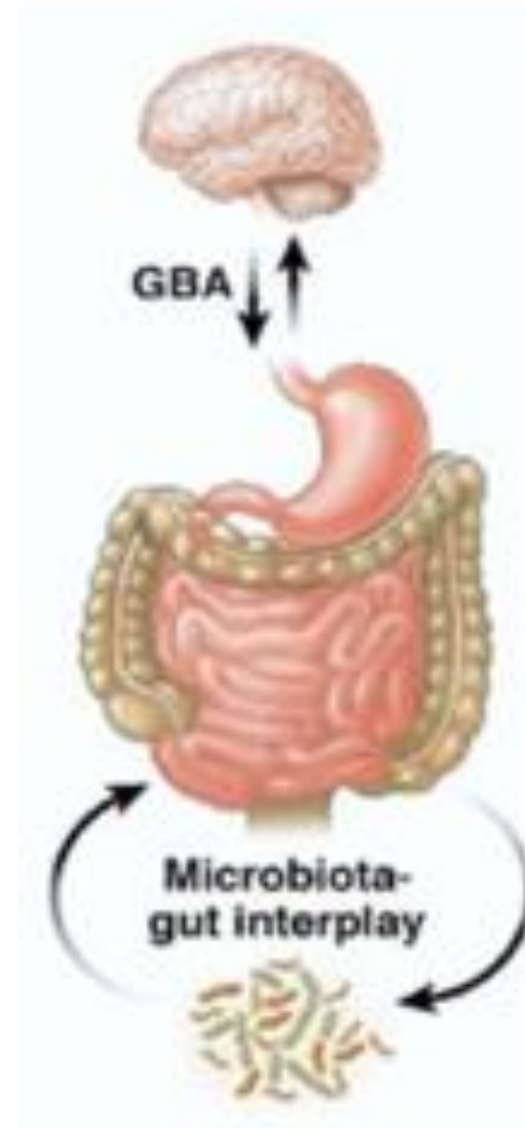


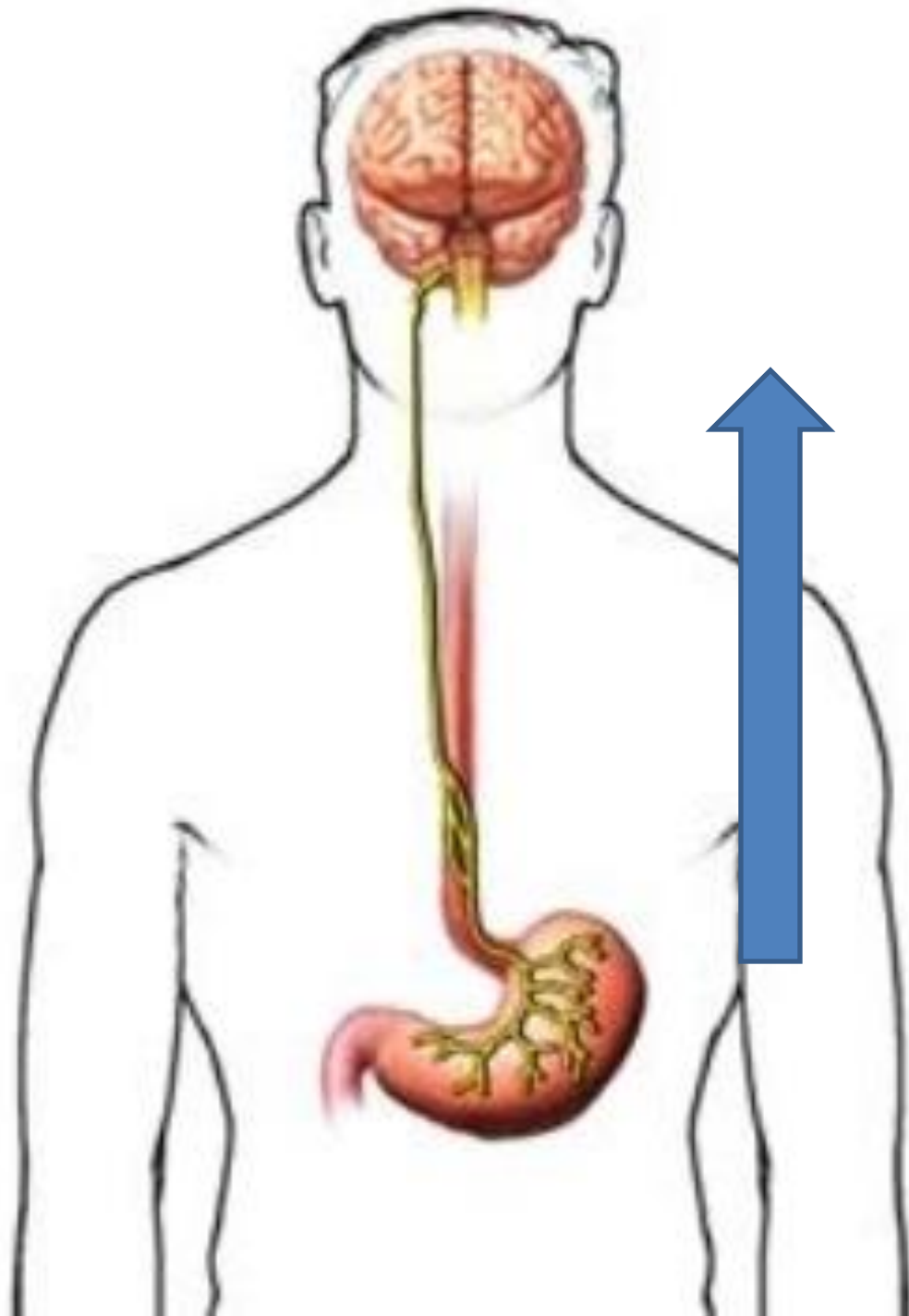
Switch The Intestinal Bacteria....



What About Humans?

Gut bacteria found to be associated with behavior and brain differences in anxiety and depression.



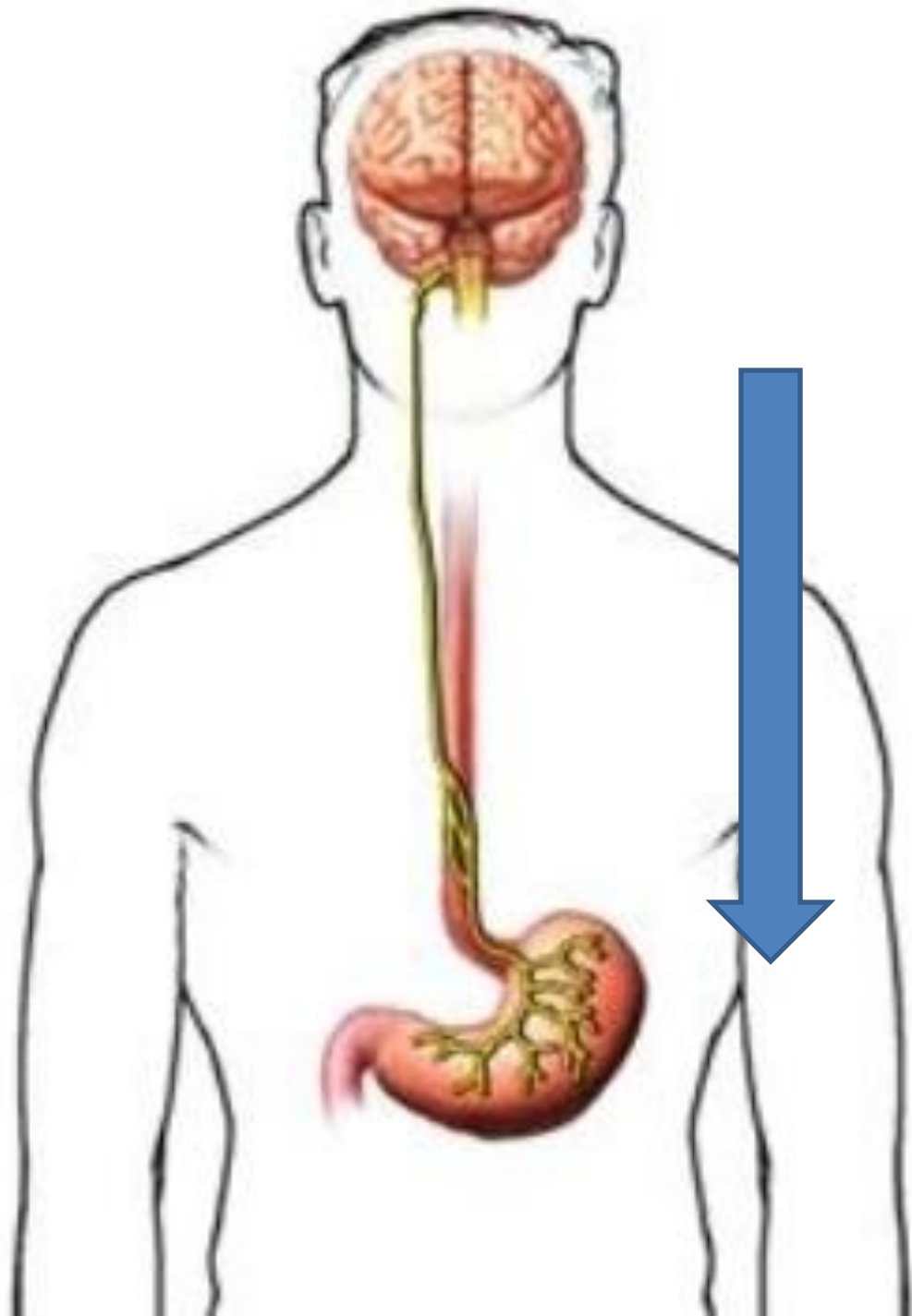


How Can Bacteria
In Gut Impact The
Brain?

Question: Where Do We Get Our Bacteria?

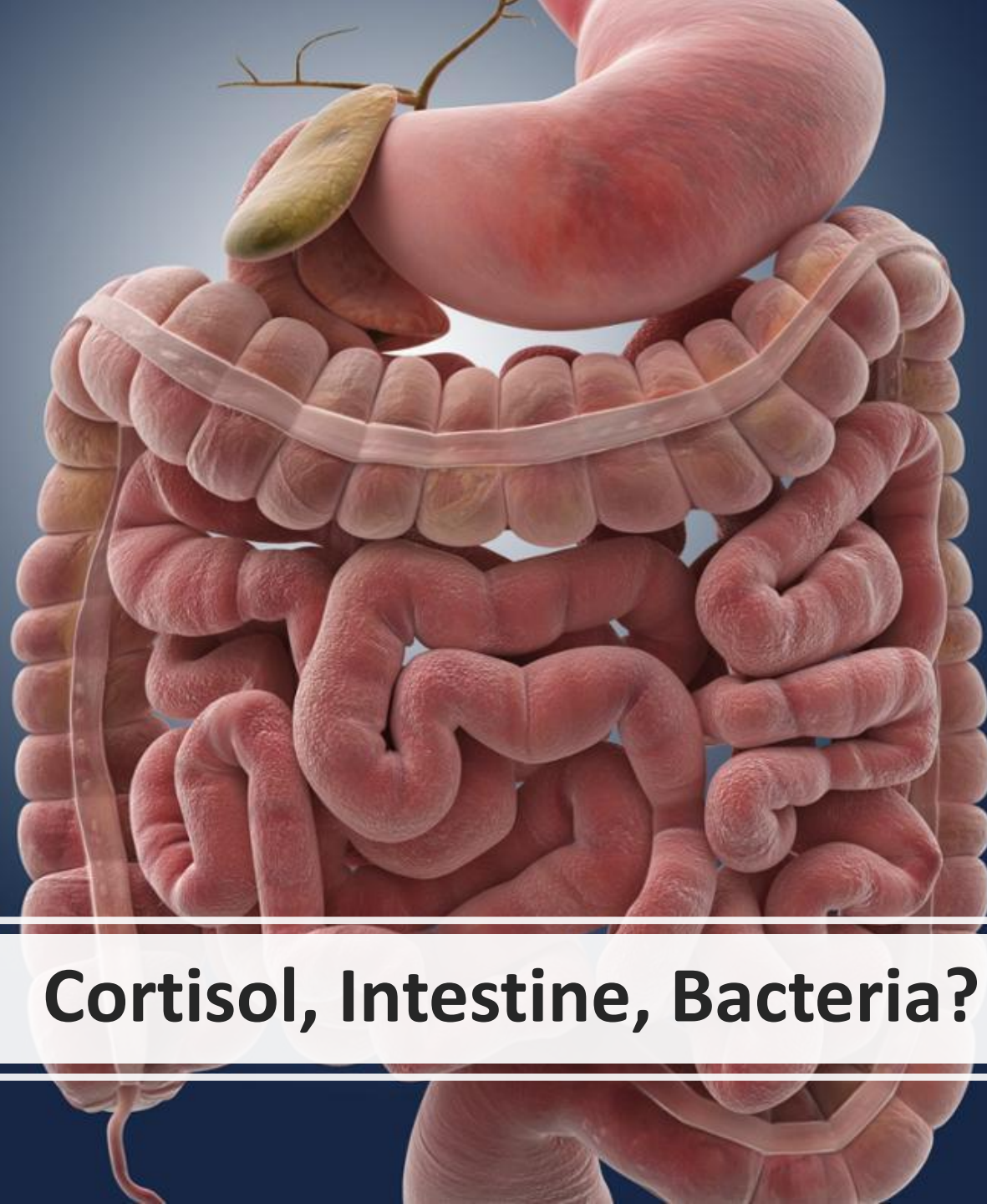
- Bacteria changes in birth canal?
- Breast milk and 10%?
- Genetics? Environment?
- When settled?
- What Came First Your Bacteria Or Your Immune System?





What About
From The Brain
To The Gut?

Two Way Street



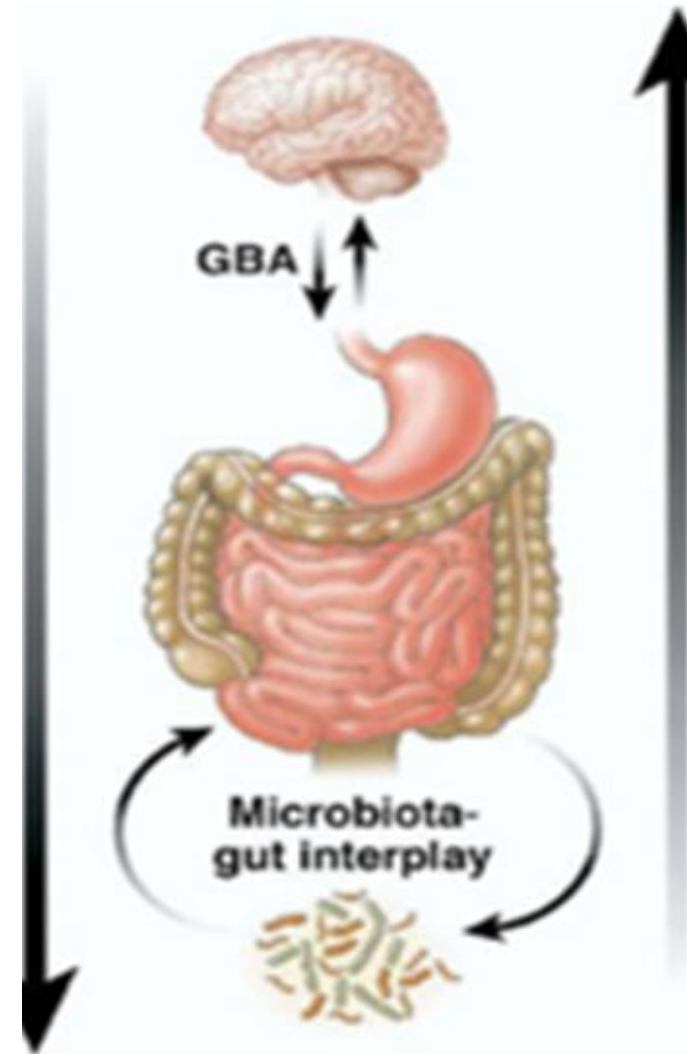
Cortisol, Intestine, Bacteria?

Link Between IBS, Anxiety and The Brain?



Take Home Message:

**It's A Two-Way Street
and Can Be A
Vicious Cycle**



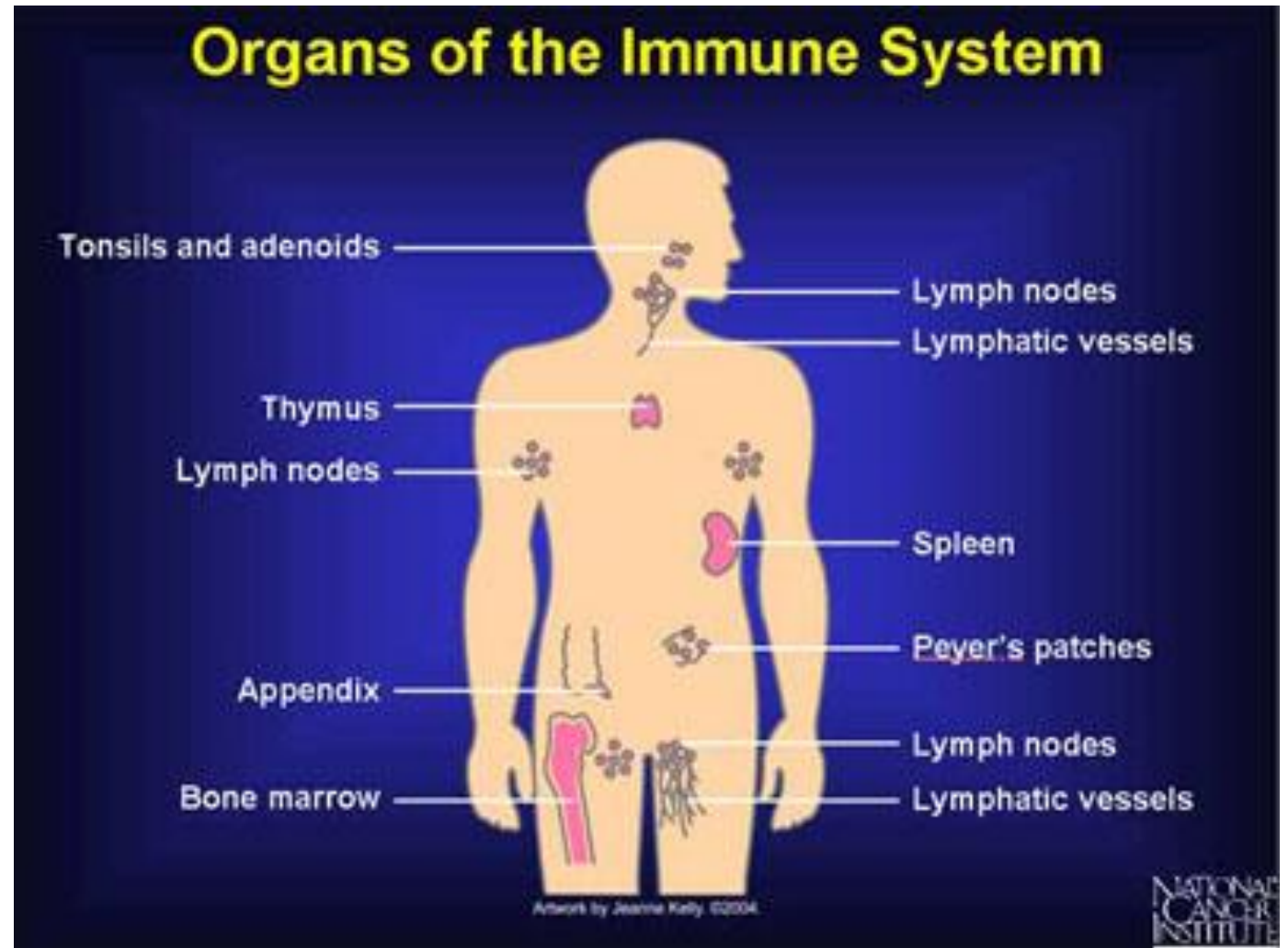
Treatment For IBS and Digestive Disorders In Some Cases Need To Include?

- Antidepressants
- Mind-body therapies like cognitive behavioral therapy
- Mindfulness



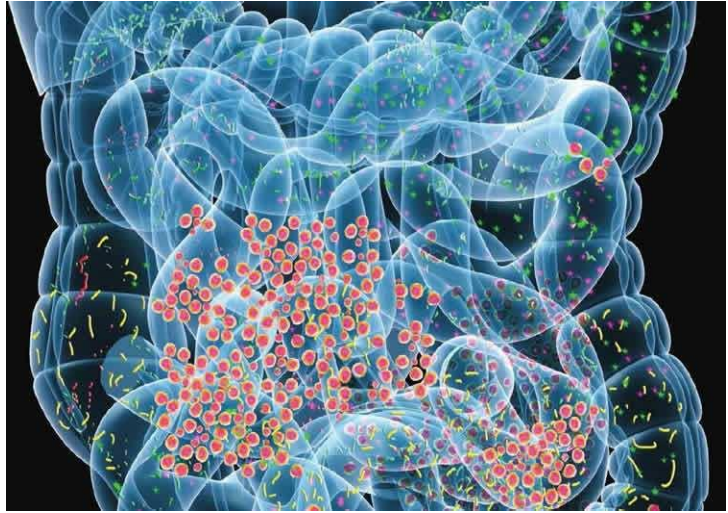
Complexity Of This Puzzle

The immune system
preserves you and gets rid of
things that aren't you....



**BUT, Most of You
Isn't You....**



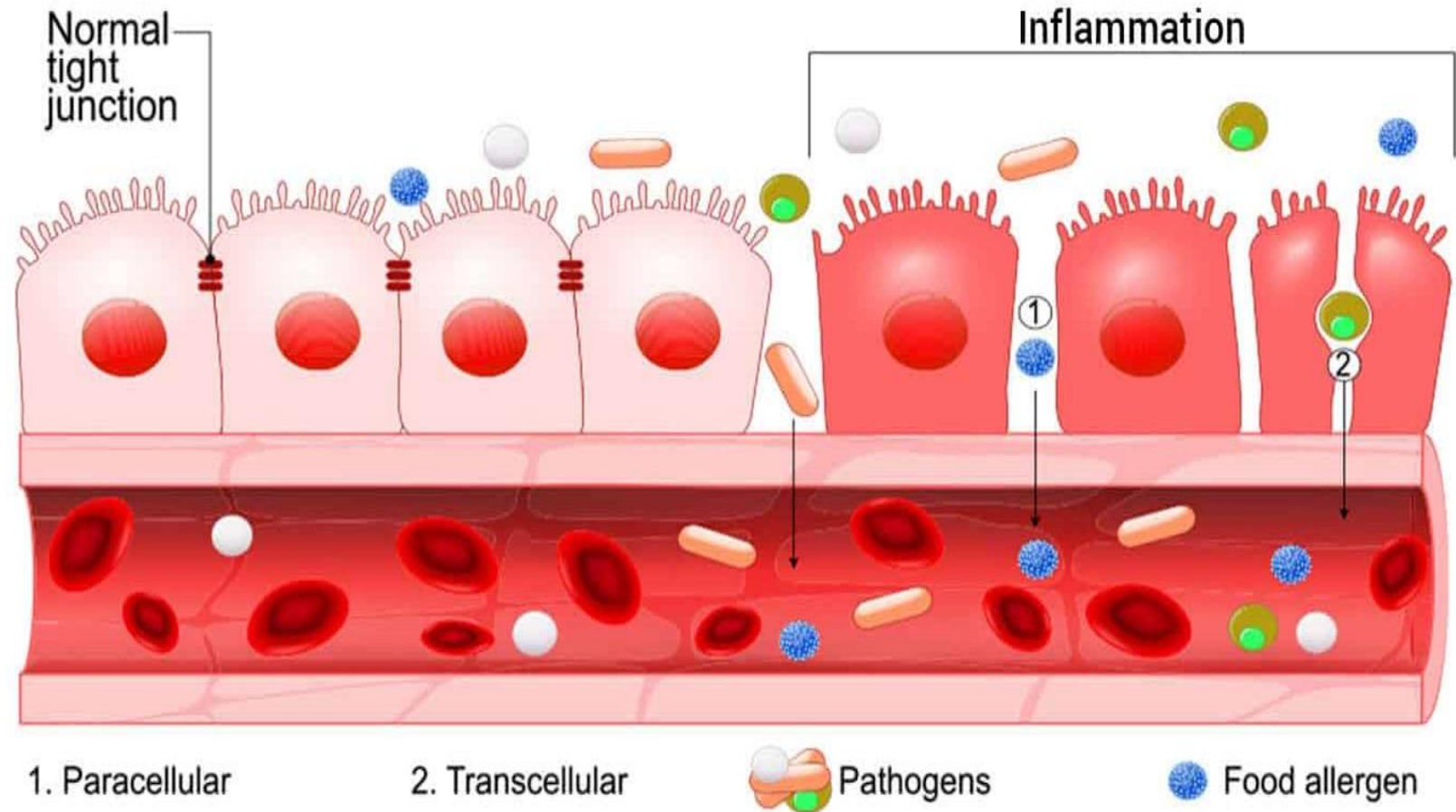


Bacteria Is Informing The Immune System

How Does Gut Bacteria Lead to Inflammation?

Good vs Bad Bacteria and The Leaky Gut

- 1. Barrier (bouncer at the bar)
- 2. Wrong types of bacteria release chemicals that stimulate inflammation.



Part 3: How To Have A Healthy and Diverse Gut



Are Probiotic Supplements The Answer?



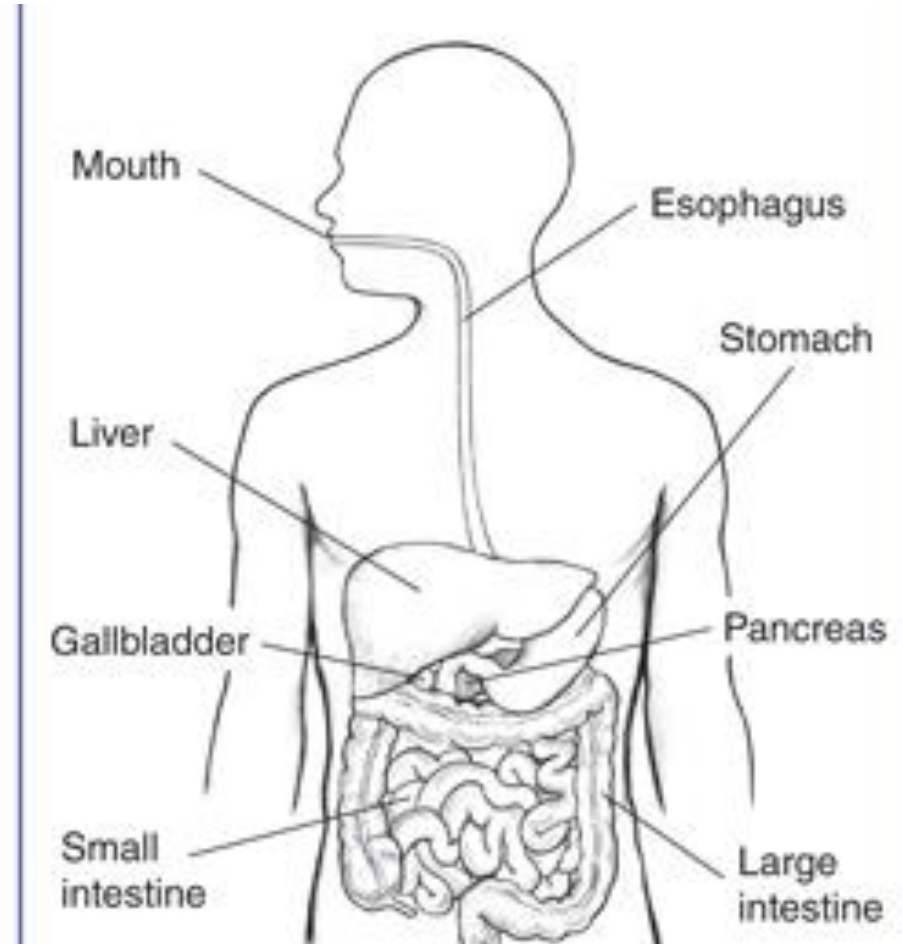
Probiotic Supplements Are A Booming Industry!





What Is The Medical Evidence?

How Alike Is Our Bacteria From One Person To The Next?





3 Big Concerns with Supplements

What are you
getting?

Tested?

What does “supports
health” mean?

Important Take Home Message:

There is no strong medical evidence that probiotic supplements help healthy people.

There is emerging evidence probiotic supplements can be used as or part of a treatment in a vareity of diseases and disorders. Critical to use the correct probiotic. **Great question to ask personal doctor.**

4 Tips For Keeping Your Bacteria Healthy and Diverse!



1. Probiotics in Food



Yogurt (homemade?), kefir, Sauerkraut

Diet: What we eat determines which bacteria flourish.

Is all yogurt
created
equal?

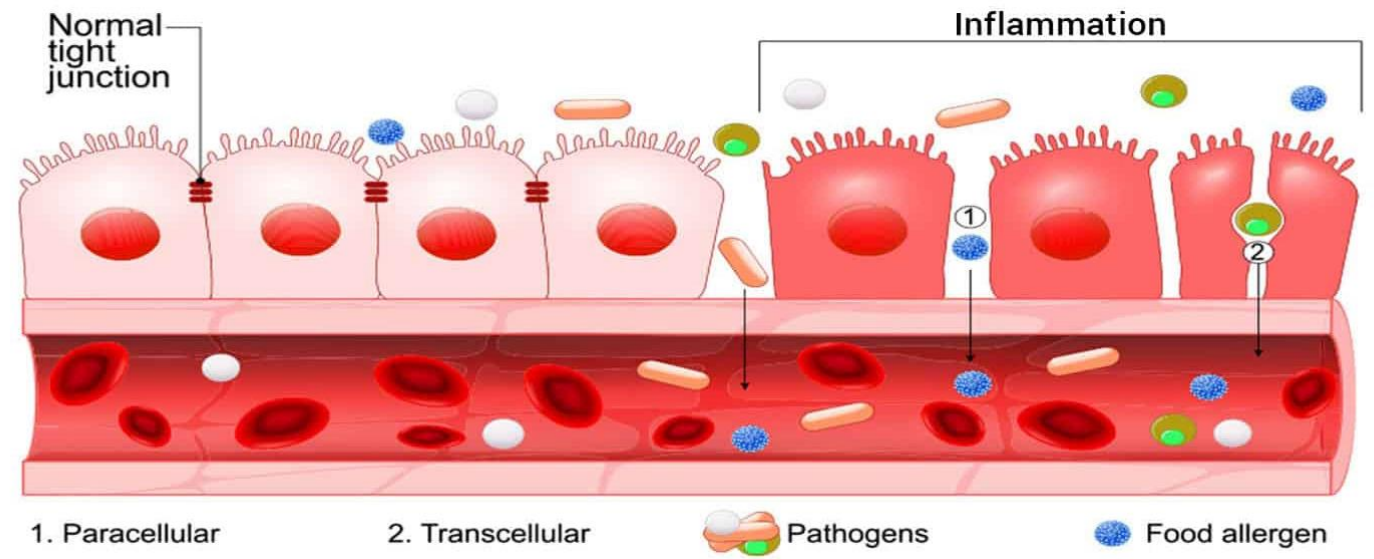


Prebiotics are Food For “Good” Bacteria



- **FIBER** whole grains, fruits, root vegetables, legumes, Legumes (e.g. red kidney beans, chickpeas, hummus baked beans, split peas, cashews, pistachios).

Why Fiber and What Happens Without It???



- Fiber is long chains of sugars that are too difficult to digest on our own.
- Fiber gets to colon where good bacteria eat it and release **butyrate**.
- Butyrate heals and protects the lining of gut.
- **Increase butyrate levels shown to reduce inflammation and improving conditions in asthma and cystic fibrosis (Anand and Mande, 2018).**
- Moderate fiber

Fiber: Little Changes, Can Have A Big Impact

(Heart Health, Inflammation, Blood Pressure, Diabetes)

- Only **5 percent** of people in the US meet the recommended daily target of 25 grams for women and 35 grams for men.

	<u>Serving</u>	<u>Fiber (g)</u>
Navy Beans	½ cup	9.3
Pumpkin Seeds	1 oz	5.2
Air popped popcorn	3 cups	3.5
Sweet potatoes	1 medium	3.6
Pears	¼ cup	5.6
Raspberries	½ cup	4.0
Green Peas	½ cup	5.2

Diabetes and Fiber (Just Published)

- Compared with average of 19 grams of fiber per day, those consuming 35g per day have a 35 per cent reduced risk of dying early.
- **From author:** “If you eat white refined bread or rolls, try changing to wholegrain bread or rolls. Try brown rice, try brown pasta, try adding half a tin of legumes to meals you already make. Try an extra veggie with your main meal -- fresh, frozen, or canned without sodium are all good choices.”
- Eating potatoes with the skins on, and tossing berries, nuts, and seeds on your yogurt, cereals, or salads.
- Little changes....

1. Andrew N. Reynolds, Ashley P. Akerman, Jim Mann. **Dietary fibre and whole grains in diabetes management: Systematic review and meta-analyses.** *PLoS Medicine*, 2020; 17 (3): e1003053
DOI: [10.1371/journal.pmed.1003053](https://doi.org/10.1371/journal.pmed.1003053)

2. Sebastian Åberg, Jim Mann, Silke Neumann, Alastair B. Ross, Andrew N. Reynolds. **Whole-Grain Processing and Glycemic Control in Type 2 Diabetes: A Randomized Crossover Trial.** *Diabetes Care*, 2020; dc200263 DOI: [10.2337/dc20-0263](https://doi.org/10.2337/dc20-0263)

3. Andrew Reynolds, Jim Mann, John Cummings, Nicola Winter, Evelyn Mete, Lisa Te Morenga. **Carbohydrate quality and human health: a series of systematic reviews and meta-analyses.** *The Lancet*, 2019; 393 (10170): 434 DOI: [10.1016/S0140-6736\(18\)31809-9](https://doi.org/10.1016/S0140-6736(18)31809-9)

Tricks of The Food Industry

- Study found difference between minimally processed vs more processed whole grains. Weight gain?



ADDED FIBER



VS.



NATURAL FIBER

1. Andrew N. Reynolds, Ashley P. Akerman, Jim Mann. **Dietary fibre and whole grains in diabetes management: Systematic review and meta-analyses.** *PLOS Medicine*, 2020; 17 (3): e1003053 DOI: [10.1371/journal.pmed.1003053](https://doi.org/10.1371/journal.pmed.1003053)

2. Sebastian Åberg, Jim Mann, Silke Neumann, Alastair B. Ross, Andrew N. Reynolds. **Whole-Grain Processing and Glycemic Control in Type 2 Diabetes: A Randomized Crossover Trial.** *Diabetes Care*, 2020; dc200263 DOI: [10.2337/dc20-0263](https://doi.org/10.2337/dc20-0263)

3. Andrew Reynolds, Jim Mann, John Cummings, Nicola Winter, Evelyn Mete, Lisa Te Morenga. **Carbohydrate quality and human health: a series of systematic reviews and meta-analyses.** *The Lancet*, 2019; 393 (10170): 434 DOI: [10.1016/S0140-6736\(18\)31809-9](https://doi.org/10.1016/S0140-6736(18)31809-9)

Labelling Tricks

- **Good:**

100% Whole Grain or 100% Whole Wheat

No refined grains or refined flour was used

Oats, oat bran, spelt, flax, rye, or barley flour. These are all “whole grains.”

- **Doesn't Mean Much:**

Wheat or Made With Whole Grains

- **Watch Out For:**

More Fiber or Added Fiber

3. Foods That Can Feed Bad Bacteria

Ability to focus after eating one meal high in saturated fat?

And the effect of leaky gut on concentration

- Study: 51 women ate either a meal high in saturated fat or the same meal made with **sunflower oil**, which is high in unsaturated fat.
- Participants with leakier guts performed worse on the attention assessment no matter which meal they had eaten.
- Came back weeks later and switched meal?



This Stuff Feeds Bad Bacteria:

INGREDIENTS: ENRICHED FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, THIAMIN MONONITRATE [VITAMIN B₁], RIBOFLAVIN [VITAMIN B₂], FOLIC ACID), CORN SYRUP, SUGAR, SOYBEAN AND PALM OIL (WITH TBHQ FOR FRESHNESS), CORN SYRUP SOLIDS, DEXTROSE, HIGH FRUCTOSE CORN SYRUP, FRUCTOSE, GLYCERIN, CONTAINS 2% OR LESS OF COCOA (PROCESSED WITH ALKALI), POLYDEXTROSE, MODIFIED CORN STARCH, SALT, DRIED CREAM, CALCIUM CARBONATE, CORNSTARCH, LEAVENING (BAKING SODA, SODIUM ACID PYROPHOSPHATE, MONOCALCIUM PHOSPHATE, CALCIUM SULFATE), DISTILLED MONOGLYCERIDES, HYDROGENATED PALM KERNEL OIL, SODIUM STEAROYL LACTYLATE, GELATIN, COLOR ADDED, SOY LECITHIN, DATEM, NATURAL AND ARTIFICIAL FLAVOR, VANILLA EXTRACT, CARNAUBA WAX, XANTHAN GUM, VITAMIN A PALMITATE, YELLOW #5 LAKE, RED #40 LAKE, CARAMEL COLOR, NIACINAMIDE, BLUE #2 LAKE, REDUCED IRON, YELLOW #6 LAKE, PYRIDOXINE HYDROCHLORIDE (VITAMIN B₆), RIBOFLAVIN (VITAMIN B₂), THIAMIN HYDROCHLORIDE (VITAMIN B₁), CITRIC ACID, FOLIC ACID, RED #40, YELLOW #5, YELLOW #6, BLUE #2, BLUE #1.

Easy Message: Which Fruits and Vegetables?
Think Diversity....



Gut Healthy Snack?

Crickets!!!



Valerie J. Stull, Elijah Finer, Rachel S. Bergmans, Hallie P. Febvre, Colin Longhurst, Daniel K. Manter, Jonathan A. Patz, Tiffany L. Weir. **Impact of Edible Cricket Consumption on Gut Microbiota in Healthy Adults, a Double-blind, Randomized Crossover Trial.** *Scientific Reports*, 2018; 8 (1) DOI: [10.1038/s41598-018-29032-2](https://doi.org/10.1038/s41598-018-29032-2)

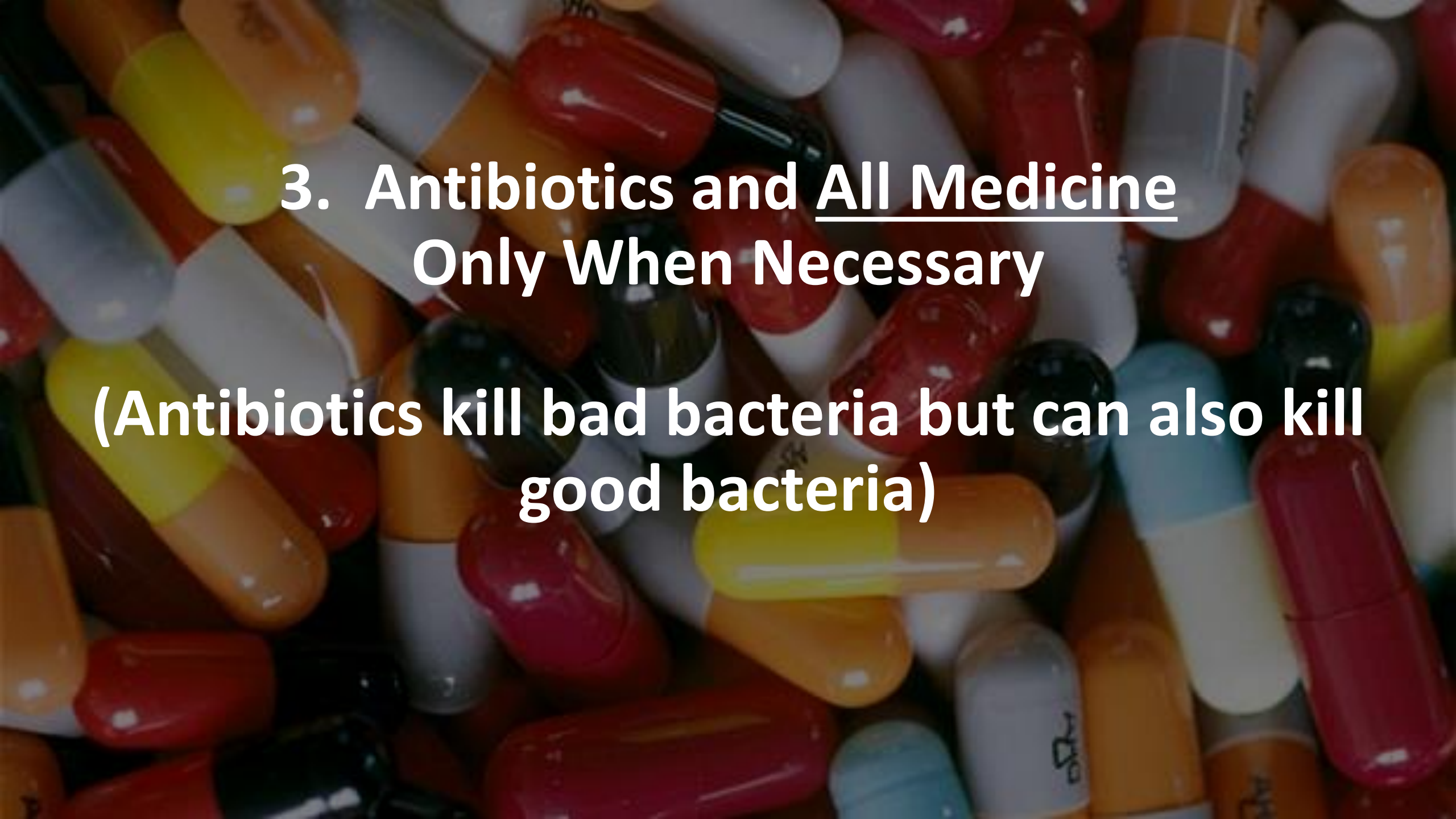
Walnuts



Eating two to three ounces of walnuts a day as part of a healthy diet could be a good way to improve gut health and reduce the risk of heart disease. Think prebiotic snacks....

Could Your Bacteria Be Telling You What To Eat?



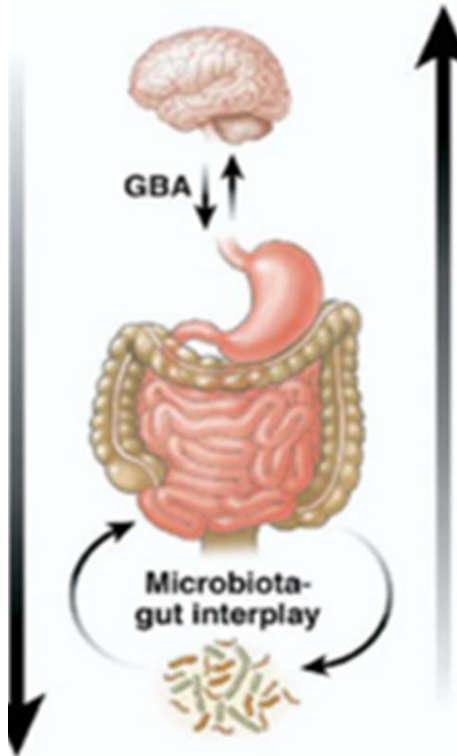


**3. Antibiotics and All Medicine
Only When Necessary**

**(Antibiotics kill bad bacteria but can also kill
good bacteria)**

Three More Ways To Balance and Diversify Gut Bacteria





5 Minutes of “Deep Belly” Breathing Relaxes Nerves Between Gut and Brain

Forces us to calm and pay attention to this system.

**Is There Bacteria On
Our Skin?**

Without Bacteria....



Do Mosquitoes Love You?



Final Thoughts on Gut (In General):

- Bacteria is an important piece along with genes and environment.
- There is a rush to sell products.
- To take care of bacteria think whole, natural foods, prebiotic fiber, sleep and stress management.



A microscopic view of numerous green, rod-shaped bacteria, likely Bacillus pasteurii, against a dark green background. The bacteria are of various sizes and orientations, some appearing as long, thick rods and others as smaller, thinner rods. The central text is white and reads:

Hope You and Your Bacteria
Enjoy Your Next Meal!

For More Info:

