The Microbiome: Lessons From the Gut – Part 1

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Taking Charge of our Microbiome and Helping the Environment of our Intestines

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Editor’s Note: Simran took a different approach to our environment theme. She is focusing on our internal environment. She is on a mission to promote healthy eating habits in kids. She interviewed Dr. Vincent Young to understand the relationship between the gut microbiome, health, and disease.

Gut microbiome, a synchondrosis of bacteria, fungi, and viruses that are present in our large intestine. We are more bacteria than human. These microbes aid in digestion, making vitamins such as B12, thiamine, riboflavin, and regulating our immune function. They are like an organ system for humans. If we have a healthy gut microbiome, we will remain protected from several diseases.

I asked Dr. Vincent Young, an international researcher on human microbiome, how we can build a healthy gut microbiome and prevent the growth of pathogenic bacteria such as Clostridium difficile seen above.

He said, “The more diverse food groups we include in our diet, the healthier microbiome we will build. We need to eat lots of fruits, vegetables, and whole grains and avoid processed foods like candy.” Interestingly, Dr. Young pointed out that we don’t need special diets or “pills containing healthy bacteria” to improve our microbiome.

Some drugs, such as antibiotics and steroids, can harm our microbiome and cause an imbalance of good and bad bacteria in our gut, this is called dysbiosis. I wondered if this could be reversed by eating healthy foods. When I asked Dr. Young, he said, “Yes, overtime, dysbiosis can be reversed through a healthy diet as long as these insults are eliminated.”

Did you know that the climate crisis can indirectly affect the human microbiome over time? By using more processed and convenience foods we are also destroying the climate, which will also affect our microbiome over time.

I believe we can all do our part to build a healthy world and protect our microbiomes.”

*FluorCD* is from Dr. Vincent Young’s Laboratory. The green bacteria are *Clostridium difficile* (pathogenic bacteria that causes diarrhea). The red bacteria are all the other bacteria in the gut. The purple bacteria are the ones of the intestine.
Never forget your teachers!
Some definitions

- **Microbiome**: The total community of microbes (bacteria, fungi, viruses) **AND** the given environment that they inhabit (such as soil or the human body)

- **Microbiota**: A group of microbes in a given environment/location
A case from the hospital

- 56 year old man admitted to the hospital with a pneumonia (not Covid-19)

- Treatment with antibiotics for suspected bacterial infection

- Hospital day three, develops abdominal pain, diarrhea, and becomes severely ill
**Clostridioides difficile**

- Anaerobic, gram-positive, spore-forming, toxin producing bacterium
- Spores: environmentally stable reservoir of the organism
- Can be detected in a small fraction of the healthy population

https://www.cdc.gov/media/releases/2015/p0225-clostridium-difficile.html
Modern view of infectious diseases

Host

Indigenous Microbiota

Pathogens

Disease
Functions of the microbiota