



Department of Botany and Microbiology,
St. Aloysius College (Autonomous), Jabalpur
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TRENDS IN MICROBIOLOGY
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Microorganisms and Us

Microorganisms play a very integral part of our lives. Some are harmful while some are very beneficial to man.

Friendly Microorganisms

Microorganisms are being used for a multitude of purposes. Since ages, it has been used in the production of alcohol. They are also used in the preparation of cakes, bread, curd, etc. Apart from this, some microbes help clean up the environment. They are also being exploited for various purposes like:

- Helps break down organic wastes into reusable substances which are harmless.
- Preparation of medicine
- Preparation of food and fodder
- Preparation of alcoholic beverages
- Cleaning environment
- Preparation of Biofertilizers and Biopesticides
- Preparation of vaccines

You're never alone when it comes to your microbes. But don't get squeamish about it. Just remember how much you need them.

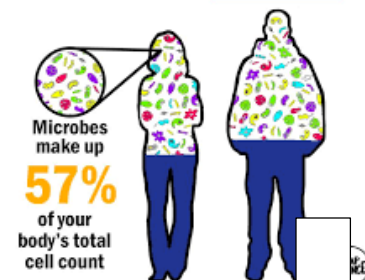
Your Microbes and You

Microbes including bacteria, fungi and viruses make us ill. But what we not realize is that trillions of microbes are living in and on our body right now. Most don't harm us at all. In fact, they help us in ways like -

- The mix of microbes in gut can affect us to use well and store energy from food.
- Skin health depends on the delicate balance between our own cells and the microbes that live on its surface.
- Microbes are also important to the body's infection-fighting immune system.
- The microbes in the female reproductive tract affect reproductive health and help protect against disease.

We tend to focus on destroying bad microbes. But taking care of good ones may be even more important.

MORE THAN HALF OF YOUR BODY IS NOT HUMAN



Human Microbiome

The human microbiome can influence our behavior, mood, personality and even our preferences for food and partners.

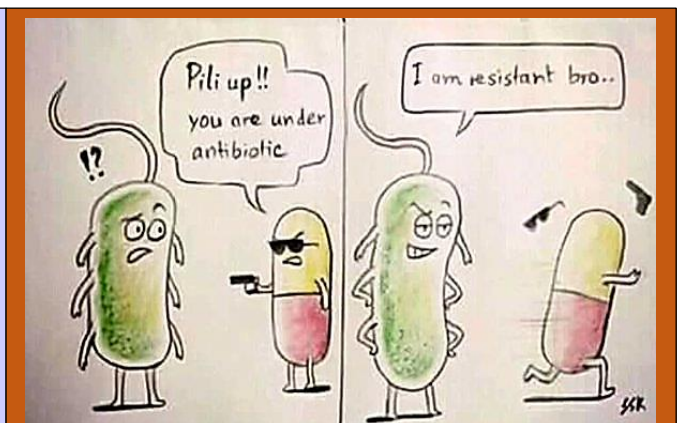
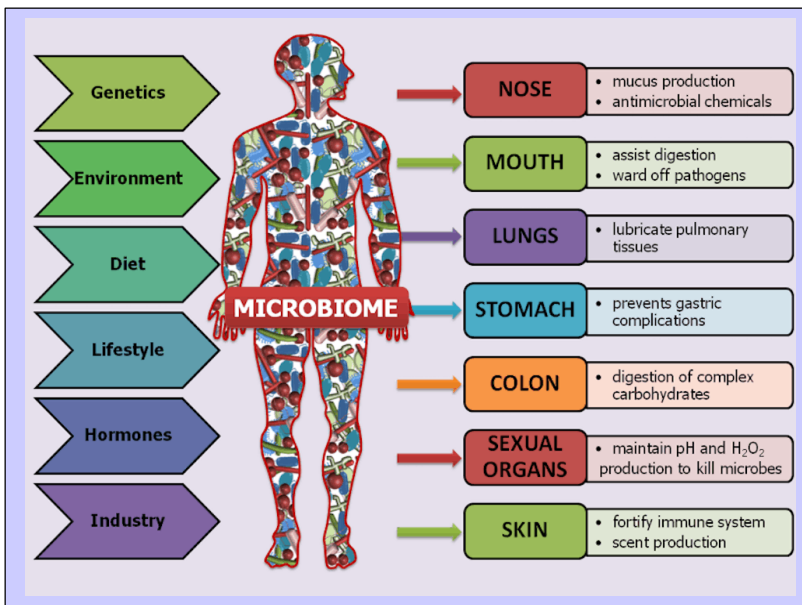
The human microbiome can change rapidly in response to stress, illness, medication, diet or travel.

Prebiotics

Foods that support increased levels of Short Chain Fatty Acid are indigestible carbohydrates and fibers. These fibers are sometimes called prebiotics as they feed our microbiota. Example: Garlic, onions, bananas, seaweed, fruits, vegetables, beans and whole grains.

"We might be changing our microbiome for the worse, by using antibiotics too often".

Blaser et. al.



By age three, each of us has acquired our own unique foundation of microbes. The makeup of this microbiota is relatively permanent throughout our lives.

Bacteria: We're good but not bad enough for you

The estimated number of bacterial cells in our body are about 10 times the number of human cells. bacteria are present everywhere including our entire body.

Some species of bacteria are harmful, but some are also beneficial, necessary for maintaining our health. These bacteria comprise the first line of defense. They protect us from foreign invaders (pathogens) that can cause infections and other disease conditions. Everybody has a personalized collection of bacteria called microbiome. We acquire our first bacteria at birth and also from daily environmental exposure. Some of these bacteria can become a permanent part of our body and play an important role in our immune system bacteria.

Probiotics are the live bacteria, good for our digestive system. Good bacteria are important for our gut health. Some bacteria make colonies in our body such as respiratory and digestive track they help us to keep balance in our immune system. Some are necessary for the proper functioning of our body cell. for example, bacteria have the ability to break down the carbohydrates present in our food into simpler compounds. They are also helpful in fatty acid absorption which is important for the growth cells.

“Basically, the healthy bacteria are filling all those little niches so that the more dangerous bacteria can't get a foothold onto the skin” - Dr. Julie Segre

Some Facts

- Human microbiome weighs~ 1.5 kg, equivalent to the weight of a human brain.
- Researchers found that your dog's tongue and paw microbes could colonize your own skin.
- No two people have the exact same mix of microbes
- All kinds of fungi, archaea and viruses and about 700 species of bacteria, live in your mouth. Most of them are harmless and keep your mouth healthy.
- The skin forms an important barrier against microbes from the outside. You have about 1.8 m² of skin and more than 1.5 trillion bacteria live on it. They prevent attack from harmful bacteria.

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