

Difference Between Microbiome and Microbiota

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Key Difference - Microbiome vs Microbiota

Microorganisms are present everywhere. Their numbers are uncountable, and they live on and in animal bodies. It is estimated that around 100 trillion microbes are present in the human body. This number is ten times the number of human cells. Microbiota and microbiome are two terms used to describe these microorganisms. Microbiota refers to all types microorganisms present in a particular location. Human microbiota refers to the microorganisms present in and on the human body. The term microbiome is used to refer the entire genetic makeup of the microbiota. Human microbiome refers to the genetic composition of human microbiota. These two terms sometimes used interchangeably. However, it is important to recognize the difference between these two terms. The key difference between microbiome and microbiota is that **microbiota includes the entire population of microorganisms that colonizes a particular location or organism** while **microbiome refers to the genetic makeup of the respective microbiota**.

What is Microbiota?

Microbiota refers to the entire population of microorganisms that colonize a particular location. All types of microorganisms including [bacteria](#), [viruses](#), [fungi](#), [archaea](#), and [protozoans](#) are addressed by the term microbiota. For example, human microbiota refers to the entire microbial population and viruses in and on the human body. Microbes are mainly present in human gastrointestinal tract and skin. The microbial population in the gastrointestinal tract of a human is known as gut microbiota. Gut microbiota is involved in human health and nutrition. Healthy gut microbiota is largely responsible for the overall health of the organism. Human gut microbiota is mainly composed of two major phyla named bacteroidetes and firmicutes. Earlier it was assumed that the gut microbiota contains 500-1000 species of microorganisms. However recent studies have revealed that the collective human gut microbiota comprises of over 35000 bacterial species.

From a microbial and immunological perspective, microorganisms are considered as [pathogens](#). Hence, host immune systems always tend to eliminate them from the body. However, the majority of the human gut microbiota contains nonpathogenic

and cohabit microorganisms which are important in many ways to humans. The human gut commensal microbes support nutrient metabolism, drug metabolism, and intestinal barrier function, and prevent colonization of pathogenic microorganisms.

Human gut microbiota mainly comprises of anaerobic microorganisms. Hence, the analysis of gut microbiota was difficult. However once the anaerobic culturing techniques were developed, it was identified that gut microbiota is dominated by *Bacteroids*, *Clostridium*, *Bifidobacterium*, etc.

There are several factors affecting the healthy gut microbiota. They are age of the human, diet, and antibiotics. Antibiotics are used to combat pathogenic microorganisms. However, due to their broad spectrum, antibiotics may also work against the normal microbiota in our gut.

What is Microbiome?

Microbiome refers to the genes or the genetic makeup of the microbiota. The collection of overall genes of the microbial community is considered under microbiome. Human microbiome refers to the complete genetic material of human microbiota. Compared to the human [genome](#), human microbiome is considered as the second genome, and it contains 100 times genes than human genes.

Sometimes the word 'microbiome' is often used to refer the microbial population and the combined genetic material of the microorganisms in a particular environment.

The genes of microbiota interact with the human genome to function together, helping to improve human health and fight against diseases. These genes are involved in numerous beneficial functions such as supporting life such as digesting food, preventing disease-causing pathogens from invading the body, and synthesizing essential nutrients and vitamins.

Research carried out on microbiome have expressed that the human microbiome is a fundamental component of human physiology. Therefore human microbiome is an important factor of human cellular activities. Changes in microbiome affect the normal function of the human body and disease development.

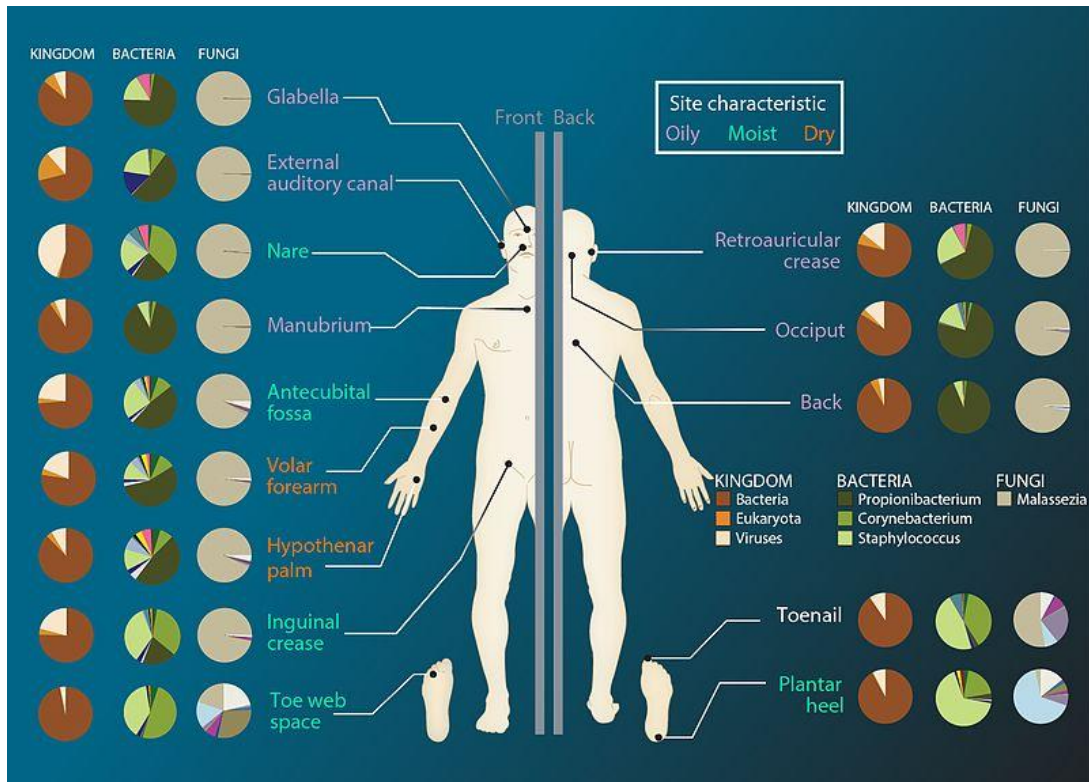


Figure 01: Human Microbiome Sites

What is the difference between Microbiome and Microbiota?

Microbiome vs Microbiota	
Microbiome is the entire collection of genetic material of microbiota in a particular location.	Microbiota is the entire microbial population in a particular location such as human body, animal body, etc.
Focus	
Microbiome focuses on genes and genetic composition	Microbiota focuses on different types and species of microorganisms.
Importance of Human Microbiome and Microbiota	
Microbiome is important to understand the collaborative function of microbiome with the human genome.	Microbiota is important in many aspects including nutrition, disease prevention, immune responses, etc

Summary - Microbiota vs Microbiome

The terms microbiota and microbiome are sometimes used interchangeably. However, there is a difference between microbiota and microbiome. Microbiota refers to the entire population of microorganisms colonized in a particular location. Microbiome refers to the genetic material of the microbiota of a particular location or the entire collection of genes of microbiota. This is the main difference between microbiome and microbiota.

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