

# CELLULAR MICROENVIRONMENT CAN BE MODULATED BY FACTORS INFLUENCED BY MICROBIOTA TO IMPROVE CANCER TREATMENT

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## Introduction

The bacteria of the gastrointestinal tract are capable of modulating the initial ecosystem, determining the possibility of colonization or not with new microorganisms. The metabolic activity of these initial bacteria can alter the conditions of the ecosystem generating metabolites, nutrients, growth factors, or modulating other factors such as pH or oxygen concentration that can favor the growth of other organisms. In contrast, they can also compete for nutrients or generate substances that prevent the growth of other microorganisms.

## Objectives

This work aims to study the factors that can be modulated to modify microbiota ecosystem and hence to avoid the disease and improve cancer treatment.

## Methods

A revision of the literature about microbiota, microenvironment, modulation factors, precision medicine, cancer, etc., was made using the main databases, pubmed and scopus.

## Results

An important aspect in the determination whether a bacterial species will be able to occupy its niche within the already established microbiota are the characteristics of that bacterium, such as the ability to adhere to the intestinal epithelium, resistance to specific conditions of the mucosa to be colonized, the mobility or sporulation capacity of bacterial species, its fermentative capacity, the generation time, etc. The intrinsic factors of the individual refer to the production of acids and secretions which will determine the pH conditions at the mucosal level, the production of hydrolytic enzymes (trypsin and lysozymes), antimicrobial substances (defensins), the intestinal motility, the production of mucus and secretions; which will determine the conditions of the habitat that must be colonized. The age of the individual is another important intrinsic factor, since it determines the presence of some bacterial genera, their metabolic activity and consequently some of the aforementioned characteristics. The main species of microorganisms change with age, showing an increase in the family Bacteroidetes overall. Among the extrinsic factors of the host, diet stands out, since it will determine the amount of undigested food that can reach the intestinal level, conditioning the growth and metabolic activities of the various bacterial groups present in the gastrointestinal tract. The clinical history of the individual also has a marked influence on the intestinal microbiota, especially in reference to the use of antibiotics in a generalized way, the suffering of autoimmune diseases, the use of immunosuppressants or the suffering of intestinal pathologies. Other factors such as temperature, climate, physical activity, environmental pollution or stress can significantly affect the composition of the intestinal microbiota. All of these factors are relevant and cause an important effect on the basal intestinal microbiota of the individual.

## Conclusions

Numerous environmental factors affect the ecosystem of the microbiota, so its composition and diversity can be modified by changes produced in these factors. These alterations can facilitate the appearance of pathological processes, including carcinogenesis. The good state of the microbiota can favor a better response to the treatment of some types of cancer.

Factors of the microbiota	Intrinsic factors of the host	Extrinsic factors of the host
Adhesion	Secretions	Diet
Nutritional flexibility	pH	Antibiotic consumption
Antimicrobial spores, capsules and components	Viable cells	Temperature
Metabolic cooperation	Age	Climate
Growth factors	Sex	Physical activity
Antagonisms and stimulation	Temperature	Medical history
		Consumption of drugs

