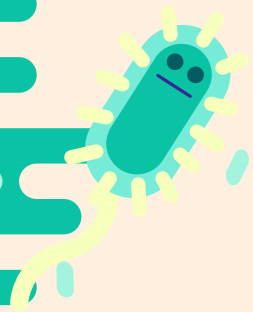
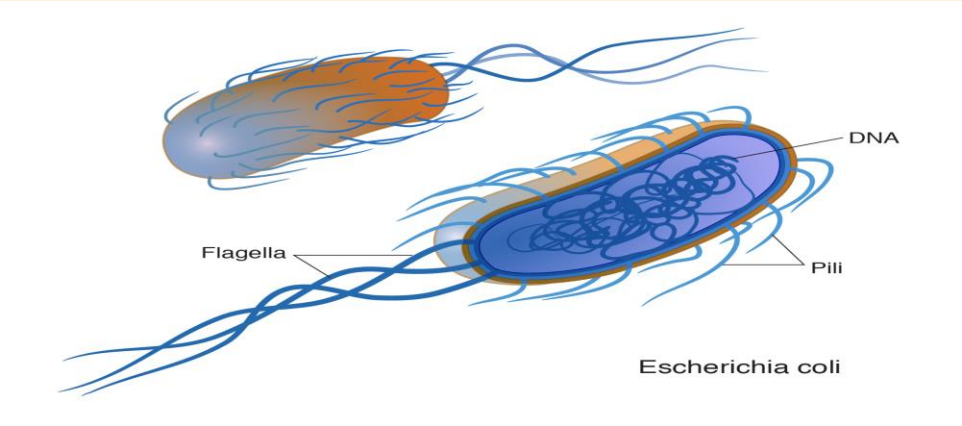
Bacteria & oral disease and oral immunity

By : Assist lec. Enas K. Alkhazraji



Bacteria

Bacteria are small single-celled organisms. Bacteria are found almost everywhere on Earth and are vital to the planet's ecosystems. Some species can live under extreme conditions of temperature and pressure. The human body is full of bacteria, and in fact is estimated to contain more bacterial cells than human cells. Most bacteria in the body are harmless, and some are even helpful. A relatively small number of species cause disease.



Good and Bad Bacteria

As you can see, our oral cavity is a complex system. What's more, it has its own unique ecosystem formed by bacteria. Every person has a unique collection of both good and bad bacteria living in their mouth. In the norm, they live in homeostasis, which is in balance.

However, the colonization of the oral cavity with new microorganisms, which can be viral, bacterial, or fungal in nature, will cause an imbalance, thus provoking a disease.

The role of the "good" bacteria in the mouth ensures the health of your teeth and gums, while also keeping the population of "bad" bacteria at bay.

Types of bacteria in oral cavity

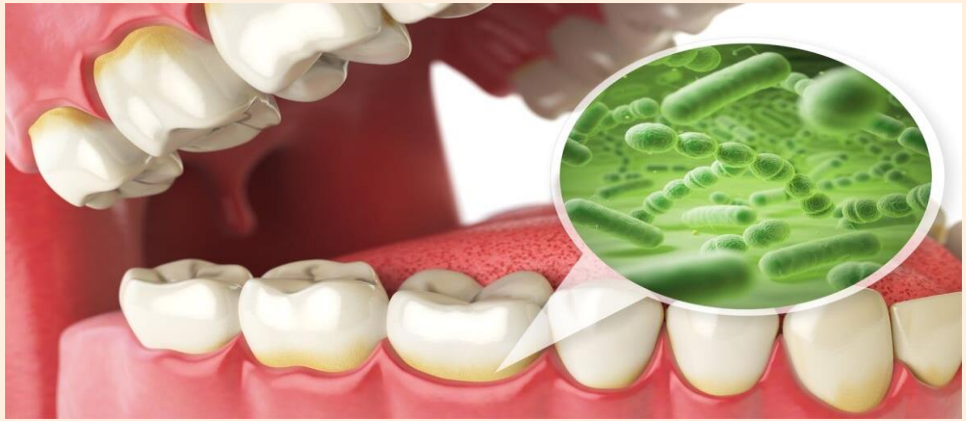
The most common oral mucosal infection is periodontal disease. This condition is considered a major public health problem in many countries. Periodontitis has been associated with the proliferation of the bacteria

1- ***Actinobacillus actinomycetemcomitans,***
2- Porphyromonas gingivalis, and
3- Prevotella intermedia.

Oral bacterial diseases

Some oral infections are common from childhood to adulthood. Learn about eight common oral infections, their signs and symptoms, and when to seek treatment.

Like any part of your body, you can get infections and illnesses that can affect your teeth, gums, and tongue. Some oral infections are more serious than others. But arming yourself with the knowledge of these common mouth infections, their causes, and typical signs can help you prevent them.



Common oral bacterial infections

Some oral infections are common from childhood to adulthood. Learn about eight common oral infections, their signs and symptoms, and when to seek treatment.

Dental Caries

Periodontal Disease

Gingivitis

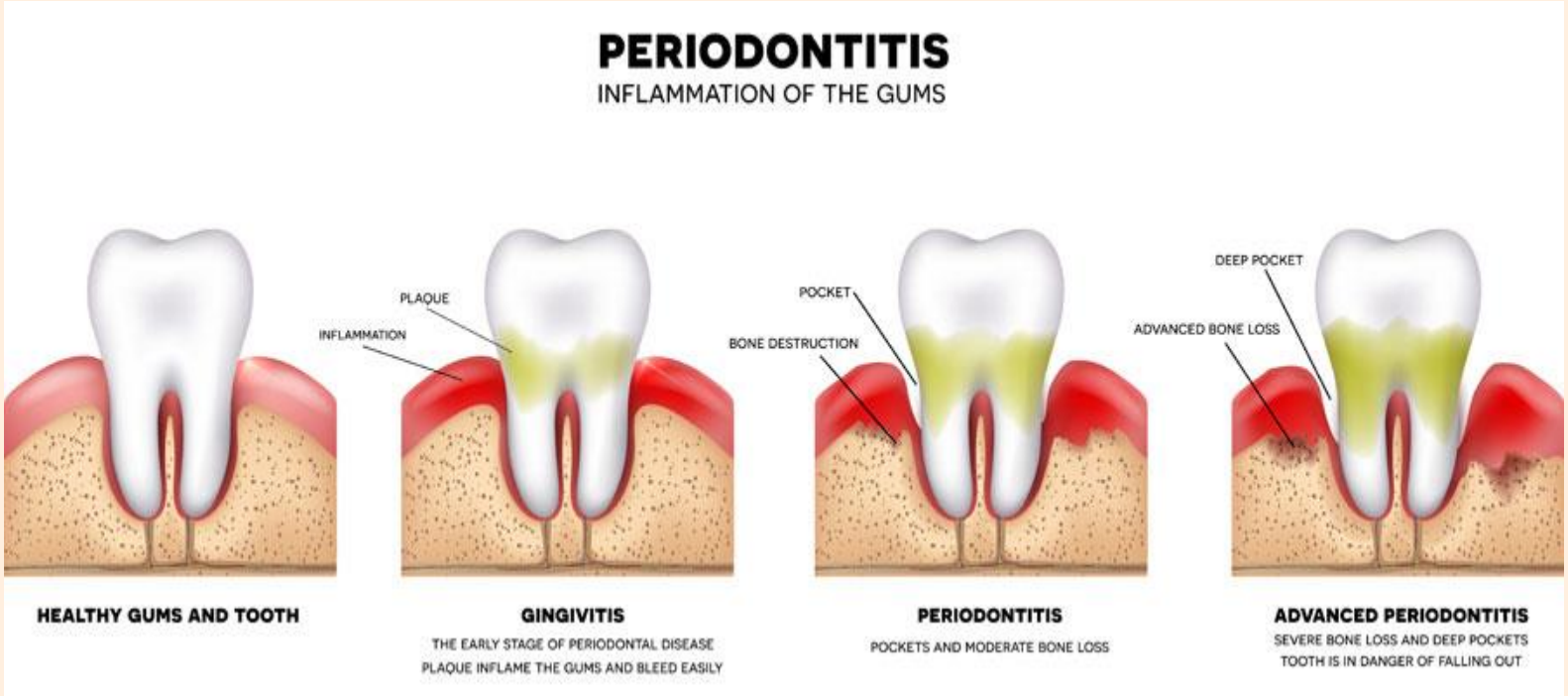
Common oral bacterial infections

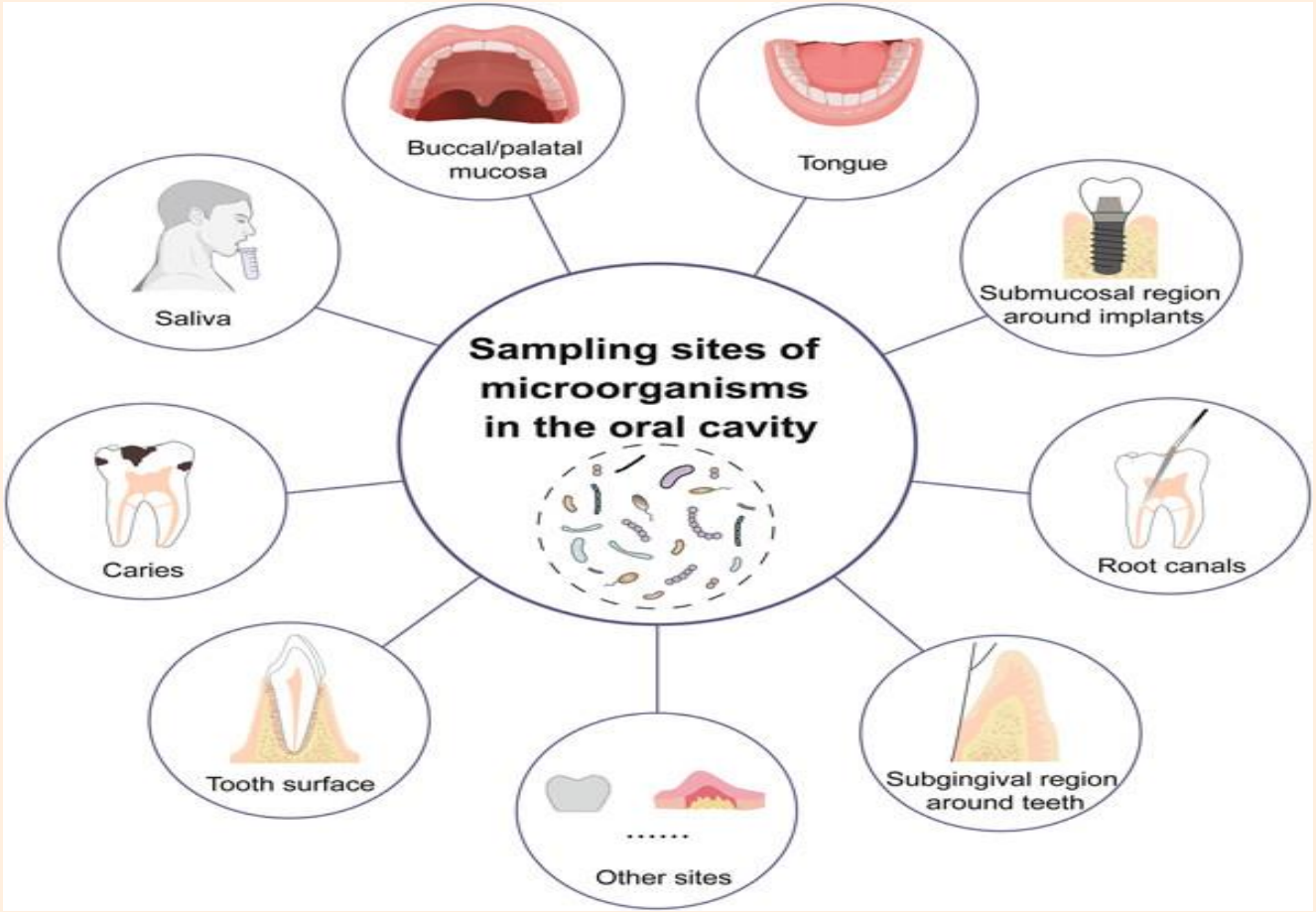
Periodontal disease is inflammation and infection of your gums and the bone that supports your teeth. It can be a result of poor hygiene, but some people are more prone to this type of infection. Symptoms may include bad breath, loose teeth and bleeding, swollen gums. There are many treatments available, depending on the severity of disease.

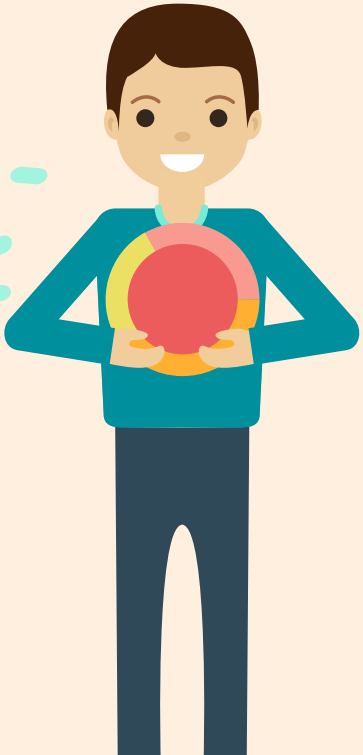
Gingivitis is a common and mild form of gum disease, also called periodontal disease. It causes irritation, redness, swelling and bleeding of your gingiva, which is the part of your gum around the base of your teeth. It's important to take gingivitis seriously and treat it promptly.

Dental caries (also known as tooth decay or dental cavities) is the most common noncommunicable disease worldwide. Severe dental caries affects general health and often causes pain and infection, which may result in tooth extraction.

Common oral bacterial infections




Sampling sites of microorganisms in the oral cavity
Buccal/palatal mucosa
Tongue
Saliva
Submucosal region around implants
Caries
Root canals
Tooth surface
Subgingival region around teeth
Other sites



Oral Immunity

The immune system

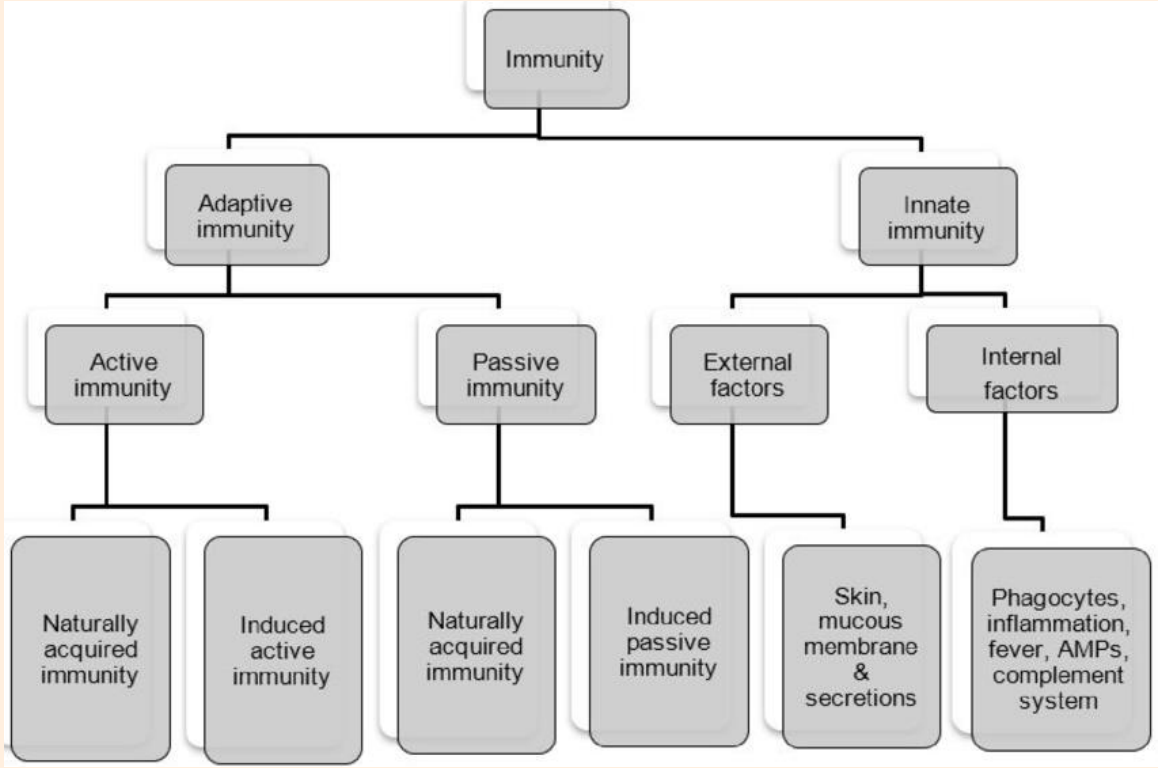
The **immune system** is a complex network of specific immune cells and proteins that work in synergy to protect the body against foreign invaders and harmful toxic materials coming from the environment.

Foreign substances that trigger an immune response are called antigens. However, under certain circumstances, such as in autoimmune diseases, the immune system can be activated by self-antigens, leading to the destruction of the body's cellular components.

Immunity can be defined as the body's ability to defend against infections. Its a way of protecting the body against an infectious disease. As immune system recognizes an antigen, it attacks it.

In general, the immune system can be activated to generate two types of immune responses: nonspecific response **(innate immunity**) and specific adaptive response (**acquired immunity**).

Types of immunity



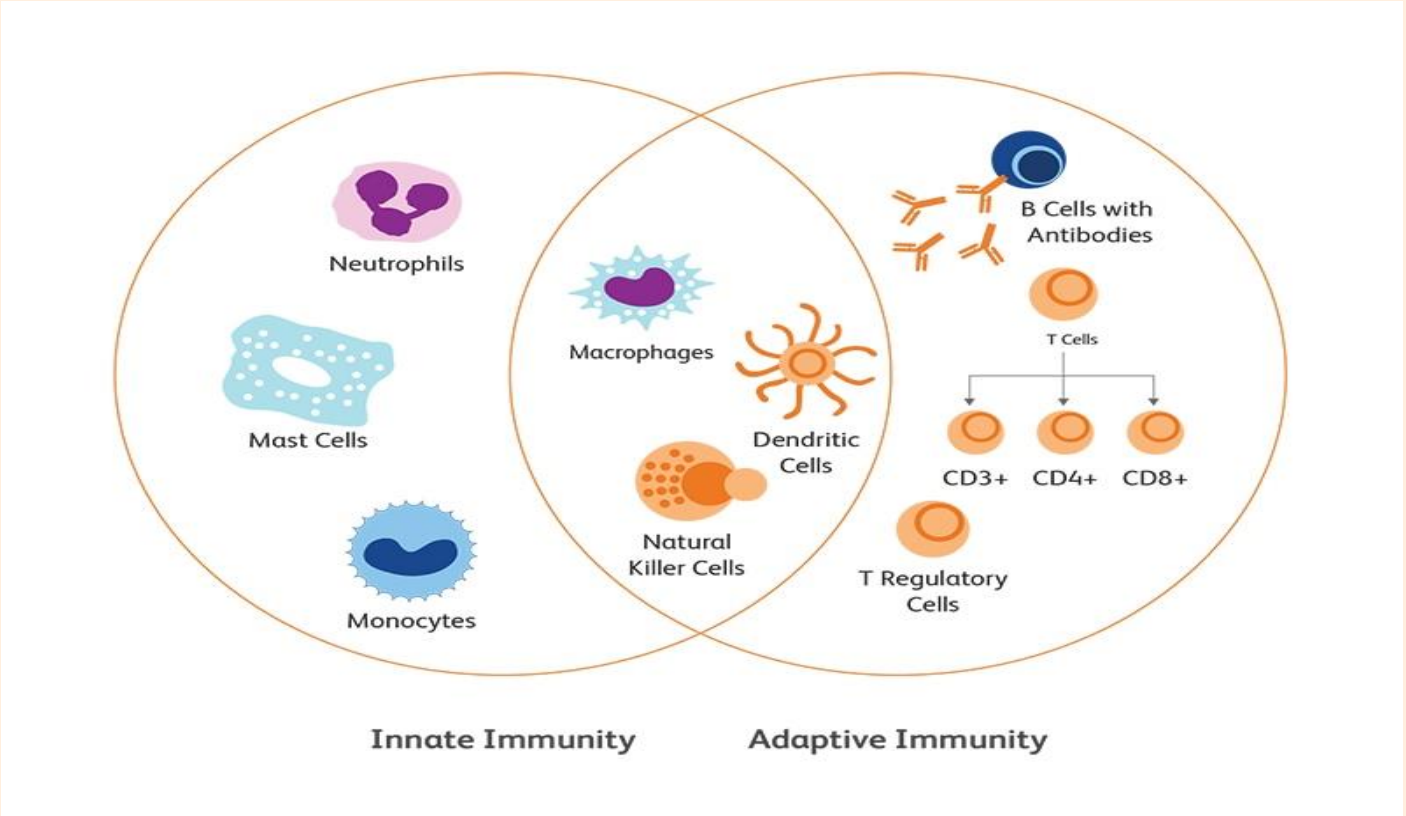
Lines of Defense of immunity

The Immune System has 3 Lines of Defense Against Foreign Pathogens:

1. Physical and Chemical Barriers (Innate Immunity)
2. Nonspecific Resistance (Innate Immunity)
3. Specific Resistance (Acquired Immunity)

NON-SPECIFIC DEFENCES (INNATE IMMUNITY)		SPECIFIC DEFENCES (ADAPTIVE IMMUNITY)
First line of defense	**Second line of defense**	**Third line of defense**
• Skin • Mucous membranes • Secretions of skin and mucous membranes	• Phagocytic leukocytes • Antimicrobial proteins • Inflammatory response • Fever	• Lymphocytes • Antibodies • Memory cells

Immunity cells



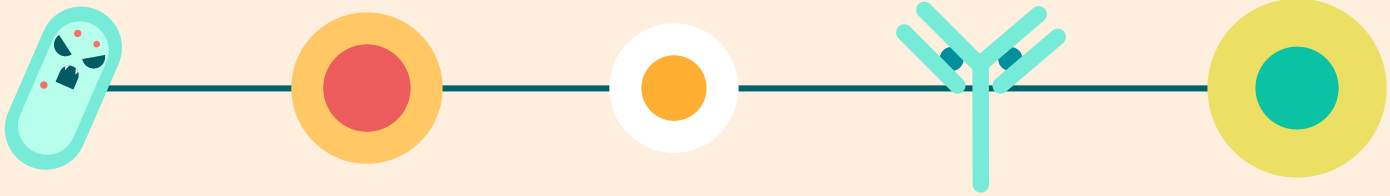
Infection process

2. Barriers

Saturn is composed mostly of hydrogen

4. Antibodies

Neptune is the farthest planet



1. Bacteria

Despite being red, Mars is cold

3. Helper T cells

Venus is the second from the Sun

5. Memory cells

Jupiter is the biggest planet in the System


Thank You!