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Pseudomonas Aeruginosa: Characteristics, Forms, Life Span, Infectious

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Abstract

Pseudomonas aeruginosa is a gram-negative bacterium found mainly in water, moist soil and hospital settings. It is characterized as an important opportunistic pathogen in humans. It was first described in 1894 by the famous German philosopher Walter Emile Magola. It is a bacterium that has the ability to synthesize certain oils, such as pyridine and pyruvate, among other things. This bacterium is extremely important in the health sector, as it is responsible for a high percentage of infections in patients who are incarcerated in health facilities. It has the potential to cause infections in the skin, respiratory tract and urinary tract, among others.

Key Words: Pseudomonas Aeruginosa, Characteristics, Forms, Life Span, Infectious

Introduction

Pseudomonas aeruginosa is a bacterium classified in the group of Gram-negative individuals. This indicates that when it is subjected to gram-staining, it acquires a fuchsia color. This is because they have a peptidoglycan layer

between their two cell lipid membranes. This layer is thin, so it fails to retain gram stain particles.

This battery is aerobic, which means it needs an oxygen-rich environment for growth.

This catalyst is also positive. It can synthesize the enzyme catalase and thus break down hydrogen peroxide in water and oxygen. Continuing with the biochemical reaction, Pseudomonas aeruginosa is also oxidized positive, which means that this enzyme synthesizes oxidase and, consequently, uses oxygen for energy.

Pseudomonas aeruginosa has the ability to oxidize certain carbohydrates such as galactose. However, you cannot ferment them.

About the temperature level for the growth of this bacterium, it should be around 36 36 C. However, in the laboratory it has been observed to develop up to 41 ° C.

Morphology

Pseudomonas aeruginosa This is an amorphous form-forming bacterium, about 1 to 3 μm long and 0.5 to 1 1m wide.

It has a polar flagellum made up of a complex protein structure that responds to movement and chemical stimuli in liquid media. It also allows cells to attach to membranes.

It has small filaments called yellow which are located just outside. These structures are used to transmit semi-solid media and remain on surfaces like flagellum.

Its shapes are varied, usually with large, flattened, smooth or saw-shaped edges, and a metallic luster. Dwarf colonies that grow even slower than a chronic infection are called punctate.

Mutations in colonies cause genetic and phenotypic changes, enabling them to identify different forms in the same patient depending on their location in the body.

Externally, they form lipopolysaccharides and alginacs. These biologically active substances have different protective functions of bacteria, such as for example against disease, host immune system and response to antibiotics. They also participate in adhesion and anchoring to the cell surface.

Classification

The classification of Pseudomonas aeruginosa is next:

Domain: Bacteria

Monarchy: Monira

Film: Proto-bacteria

Class: gamma proto-bacteria

Order: Pseudomondels

Family: Pseudomundasasi

Gender: Pseudomonas

Species: Pseudomonas aeruginosa

Life span

Pseudomonas aeruginosa reproduces it unannounced, like all bacteria. The process by which this is done is known as binary fashion. This is the most common bacterial reproduction process, through which the bacterial cell divides, giving rise to two cells, similar to the progenitor cell.

The first thing that happens in the process of binary fusion is that it is necessary to replicate the bacterial DNA. However, it is relatively. The process is simple, because bacteria have only one circular chromosome.

Once its genetic material is replicated, each chromosome goes to one end of the cell. At this point it is important to remember that Pseudomonas aeruginosa is a long form.

When this happens, in the central region of the bacterium, the bacterial membrane and wall form a septum or setam, which, in turn, ends up dividing the cell, resulting in the birth of two cells.

Infectious and transmissible

The bacterium Pseudomonas aeruginosa is responsible for a variety of infections in humans. Of all the species that make up it, Pseudomonas aeruginosa is the most commonly associated with this type of infection.

These germs are found mainly in water, plants, sewage, wet soil and some hosts such as humans. Similarly, it can be found in health facilities, especially surgical instruments, catheters and even the staff working there. Among those who care for patients.

In order for bacteria to infect an individual, it is imperative that the body have a gateway. In this sense, bacteria usually enter the body through a wound or soft skin, when it comes in contact with contaminants (such as contaminated water) or with a surface where bacteria are found.

Despite the fact that it is the most effective method of infectious disease, experts have confirmed that respiratory and digestive system can also cause infectious disease. Therefore, if a person inhales some kind of contaminated fluid or dissolves contaminated water from another infected person, they may be infected with bacteria.

Diseases

Because this bacterium has the ability to colonize a variety of tissues, it is responsible for a large number of infections and diseases in humans. Famous celebrities are listed below.

Ear infections

Given that the bacterium can be found in aquatic bodies in which people can swim regularly, it is not surprising that it affects this area of the anatomy.

Among the infections that can cause pseudomonas aeruginosa in the ear, we can mention acute external otitis media, an infection that affects the external auditory canal.

Patients with a chronic underlying disease, such as diabetes, may develop a more aggressive form of the disease, called malignant otitis externa.

Respiratory tract infections

When bacteria enter the body through the respiratory tract, it can cause certain pathologies such as pneumonia, bronchitis and even sinusitis.

The infection is more common in patients with respiratory illnesses and in people with chronic illnesses that weaken their immune system. These pathologies include AIDS, lupus and cystic fibrosis.

Skin infections

Given that the skin is contagious and one of the most common routes of entry for this bacterium, it is common for it to cause an infection.

Among the skin infections that cause them are pseudomonas aeruginosa cellulitis, folliculitis, osteomyelitis and eczema gangrene. All of these infections are potentially dangerous if left untreated, as they slowly injure the skin layers, can even affect very deep structures, and perhaps even blood vessels. Also cause infections.

Urinary Tract Infections

Bacteria can enter the body through the urethra due to an infection in the lower part of the urethra. It is more common in patients who are hospitalized and have catheters to help with urination.

Infectious cardiac

When a bacterium spreads in such a way that it enters the bloodstream, it can travel to the heart. There it can act on the atrioventricular valves or seminal valves and cause an infection known as acute bacterial endocarditis.

This pathology is more common in patients who have had open heart surgery in which a valve replacement or other procedure has been performed.

Symptoms

Symptoms of infection by Pseudomonas aeruginosa will vary depending on which tissue is affected.

- Ear infections
- Purulent discharge with a foul odor.
- Acute pain, especially when pressure is applied against the ear tragus

- Redness and swelling of the ear canal
- Hearing loss (hearing loss)

If a person has a disease like diabetes, the symptoms increase, even in the most severe cases, the bone is exposed.

1. Respiratory infections
2. High fever, which persists
3. Difficulty breathing (dyspnea)
4. Cough that does not subside, which can sometimes be accompanied by purulent discharge.
5. Chest pain
6. It's getting cold
7. Death and general anxiety.
8. Increased heart rate

In the case of sinusitis, the symptoms include:

Pain on the surface of the paranasal sinuses, especially when pressure is applied to them.

- Fever
- Temporary loss of sense of smell
- Nose congestion
- Nasal discharge, which can be cleared
- The feeling of pressure can be experienced even when the person lowers his head.
- Infections of the skin and other tissues
- Fever
- Redness and pain in the affected area
- Intensity of heat in the injured area

Wounds such as psoriasis or inflammatory nodules. These lesions may contain pus material.

In the case of eczema gangrene, the lesions usually have surrounding areas in which healthy tissue dies.

Infectious cardiac

The most common heart infection is endocarditis. Your symptoms are:

- Persistent fever
- It's getting cold
- Difficulty breathing and chest pain when trying
- Sweating profusely, especially at night
- Appearance of heart murmur
- Common pain and discomfort
- Urinary tract infections
- Urge to urinate
- Pain and burning when urinating
- Pelvic pain
- Treatment

Currently the mortality rate is 30 to 40% due to Pseudomonas aeruginosa, especially if the infection is located in the respiratory tract and its treatment is not sufficient, especially if the first 24 after its onset. In 48 hours.

These bacteria are resistant to various antibiotics and have great potential for acquiring new defense mechanisms. They can form biofilms, reduce outer membrane permeability, use injection pumps for various drugs, and contain enzymes that convert antibacterial.

Use of antibioticsThe number and choice of is controversial. They are divided between the idea of having a monotherapy or a combination of similar antibiotics. It is recommended to treat only with ceftazidime or in combination with amoxicillin.

Numerous drugs, such as penicillin, cephalosporins, carbapenemiums, monobacteria, aminoglycosides, fluoroquinolones, and polymyxin, in addition to manipulating these bacteria, manage to remain active. But sometimes they are not affected by changes in stress or by information obtained from new genes with acquired resistance.

Alternative research has also been done on the use of species of plants, such as antimicrobial compounds.

Studies show that in some cases antibiotic resistance profiles vary within the same country or even in the same geographical region.

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