Bacillus Anthracis (Anthrax) Characteristics

Bacillus anthracis is the bacterial agent responsible for the disease, anthrax. It is a gram-positive, spore-forming rod, and it is the only bacterium that has a polypeptide capsule. Bacillus anthracis produces several toxins; lethal toxin, protective antigen, and edema factor.

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Characteristics

Gram-Positive

Graham-cracker Positive-angel

Bacillus anthracis is a gram-positive bacteria.

Spore-Forming

Spores

This bacterium is spore-forming and can survive harsh conditions. It can remain inactive for many years, but if it comes into a favorable environment, it begins to grow again.

D-glutamate Polypeptide Capsule

D-glue-tomato Polly-peptides Capsule

Bacillus anthracis is the only bacterium with a polypeptide capsule. This is composed of D-glutamate.

Protective Antigen

Protective-shield Ant-gem

Protective antigen serves as the "trojan horse," which carries anthrax's other toxins through the host's plasma membrane, into the cytosol.

Lethal Toxin

Lethal Toxic-barrel

Lethal factor is named for its effects. It causes lethal effects in the cell it invades.

Edema Factor

Edamame

This bacillus anthracis toxin is responsible for causing edema, hence its name. This toxin is an inherent adenylate cyclase, leading to a disruption in water homeostasis.

Increased cAMP

Up-arrow Cycle-amp

Edema factor is an adenylate cyclase that greatly increases the level of cAMP in the cell. This increase in cAMP upsets water homeostasis, severely throws the intracellular signaling pathways off balance, and impairs macrophage function, allowing the bacteria to further evade the immune system.

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