Bacillus Cereus Characteristics

Bacillus cereus is a gram positive, rod shaped bacteria which causes food poisoning from preformed toxins and enterotoxins. This bacteria is beta-hemolytic, and is classically remembered for causing food poisining, even with reheated rice and pasta.



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Gram-Positive
Graham-cracker Positive-angel
Bacillus cereus is a gram positive bacteria, meaning that it takes up crystal violet stain in its thick peptidoglycan layer of its cell wall.

Bacilli
Rod
These bacteria are bacilli, meaning they are rod shaped.

Endospore Forming
Inside-spore
This bacteria can form protective endospores to protect itself from suboptimal conditions. When the environment becomes more favorable, the endospore can reactivate itself.

B Hemolytic
Beta-fish in Petri-dish
Bacillus cereus typically produces large zones of beta-hemolysis, which is complete lysis of red cells in the blood culture media.

Toxins and Enterotoxins
Toxic-barrell and Intestine-toxins
B. cereus produces a heat stable toxin (cereulide peptide toxin), which is resistant to acidic conditions and remains active at very high temperatures. This is why patients get sick, even after reheating their rice. In contrast, enterotoxins are not resistant to acidic conditions of the stomach. They can still cause symptoms if endospores are ingested, which flourish in the GI tract and release new enterotoxins.

Reheated Rice
Reheating Rice
The classic case of B. cereus food poisoning (emetic type) occurs from ingestion of reheated rice. This is because cereulide, a preformed toxin is heat resistant past 121° C. Furthermore, it should be noted that keeping rice warm results in germination of spores, along with toxin and enterotoxin formation.

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