

Vibrio Cholera Characteristics

Vibrio cholera is a gram negative, oxidase positive, comma shaped bacteria that causes a life threatening, rice water diarrhea. The biochemistry behind this infective organism is in the toxin's ability put the Gs subunit of the G protein in the "on" position with ADP ribosylation. This causes it to continuously activate adenylyl cyclase which produces cAMP. The cAMP is what binds to and opens the chloride channel (CFTR). This sustains the channels secretory ability and results in continued secretion of Cl into the gut lumen where Na and water follow. This ends in severe dehydration, electrolyte depletion and possible death. The organism is typically found in seafood, and should be treated with both glucose and Na rich electrolyte fluids.



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Gram-Negative

Graham-cracker Negative-devil

Vibrio cholera is a gram-negative bacteria that does not stain when crystal violet dye is applied due to a much thinner peptidoglycan layer.

Bacilli

Rod

Vibrio cholera is a bacillus, meaning it is shaped like a rod.

Glucose Fermenting

Glue-bottle Fern

This species is able to ferment glucose, which is a unique property allowing for the differentiation of the species from other similar bacteria.

Non-lactose Fermenting

Nun-milk-carton Ferns

The species is unable to ferment lactose as an energy source. This inability to ferment lactose is a distinguishing factor that helps with species identification.

Oxidase Positive

Ox-daisy

The species contains the enzyme oxidase. Other oxidase-positive organisms are Pseudomonas and Campylobacter jejuni.

Comma Shaped

Comma Shaped Shrimp

The characteristic shape of cholera is comma-shaped when examined under a microscope.

Thrives in Alkaline Environment

Thriving-plants at Alkaline pH

The factor that differentiates Campylobacter jejuni from Vibrio cholera is that cholera grows in an alkaline environment.

Crustaceans

Shrimp

Vibrio species are classically found in seafoods, particularly crustaceans.