

## Pseudomonas Aeruginosa Characteristics

*Pseudomonas aeruginosa* is a gram negative, aerobic bacilli that has been increasingly recognized as an opportunistic human pathogen that can cause infections in burn patients, osteomyelitis, endocarditis, pneumonia, and urinary tract infections. This organism is known for secreting pyocyanin pigment, which is blue-green in color and has a grape like odor. It can be distinguished from other gram negative organisms because it is non lactose fermenting and oxidase and catalase positive. *Pseudomonas aeruginosa* has a polysaccharide capsule that is an important virulence factor encountered primarily in cystic fibrosis. Other virulence factors include an endotoxin and exotoxin A, which ADP ribosylates elongation factor 2 in host cells causing inability to synthesize proteins. This organism is commonly described as water loving and is often transmitted from infected water sources.



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### Characteristics

#### Gram-Negative

[Graham-cracker Negative-devil](#)

This organism stains Gram negative due to relatively thin peptidoglycan layer in the cell wall.

#### Bacillus

[Rod](#)

This bacteria is rod-shaped.

#### Aerobic

[Aerobic-outfit](#)

An aerobic organism is an organism that can survive and flourish in an oxygenated environment.

#### Pyocyanin Pigment

[Pie-sai](#)

This organism is known for secreting pyocyanin pigment, which is blue-green in color and has a grape like odor.

#### Blue-green Pigment

[Blue Green Pig](#)

This organism is known for secreting pyocyanin pigment, which is blue-green in color and has a grape like odor.

#### Grape like odor

[Grape-pie](#)

This organism is known for secreting pyocyanin pigment, which is blue-green in color and has a grape like odor.

#### Non-lactose Fermenting

[Nun Milk-carton Ferns](#)

This organism can be distinguished from other gram negative bacteria because it is non lactose fermenting, causing growth of white colonies on MacConkey agar.

## Polysaccharide Capsule

### Poly-sack Capsule

*Pseudomonas aeruginosa* has a polysaccharide capsule that is an important virulence factor encountered primarily in cystic fibrosis.

## Catalase-Positive

### Positive-cat

Characteristically, this organism is catalase positive, meaning it produces the enzyme catalase. This enzyme allows the bacterium to convert hydrogen peroxide to water and oxygen.

## Oxidase-Positive

### Ox-daisy

An oxidase test is used to determine if bacteria produce certain cytochrome c oxidases to help differentiate bacteria. *Pseudomonas* is oxidase positive.

## Inactivates Elongation Factor 2

### Elongated elves in (2) Tutus

*Pseudomonas* uses the virulence factor exotoxin A to ADP ribosylate elongation factor 2 in host cells, similar to the mechanism of diphtheria toxin. Defective elongation factor 2 causes the inability of the host cell to synthesize proteins and leads to necrosis.

## Exotoxin A

### Bursting-toxic-balloon with A's-flying-out

An exotoxin is classified as a toxin that is released by bacteria into the environment. *Pseudomonas* uses the virulence factor exotoxin A to ADP ribosylate elongation factor 2 in host cells, similar to the mechanism of diphtheria toxin. Defective elongation factor 2 causes the inability of the host cell to synthesize proteins and leads to necrosis.

## Endotoxin

### Unpopped-toxic-balloon

Endotoxin refers to the term lipopolysaccharide, which is a major component of the outer cell membrane of gram negative bacteria. Lipopolysaccharide consists of a sugar chain and a lipid moiety called lipid A, which is responsible for the toxic effects of the endotoxin.

## Water sources

### Source of Water

This organism is commonly described as water loving and is often transmitted from infected water sources like hot tubs and contact cases.