

## Listeria Monocytogenes Characteristics

*Listeria monocytogenes* is a gram-positive coccobacilli that causes the infection listeriosis. In humans, manifestations of listeriosis include meningitis, granulomatosis infantiseptica, influenza-like symptoms and gastrointestinal symptoms. It is a facultative intracellular microbe that grows and reproduces inside host's cells and moves within eukaryotic cells by explosive polymerization of actin filaments, called actin rockets. This organism exhibits a characteristic motility, described as tumbling motility when viewed with light microscopy, which can help with identification. It is catalase- positive and expresses a beta-hemolysin, which causes destruction of red blood cells. *Listeria* was initially thought to be unique among gram-positive bacteria because it appeared to possess lipopolysaccharide, which serves as an endotoxin. Later, it was classified as not a true endotoxin. However, the cell walls contain lipoteichoic acids which resemble the lipopolysaccharides of gram- negative bacteria in structure and function.



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### Characteristics

#### Gram Positive

[Graham-cracker Positive-angel](#)

This organism stains positive on Gram stain due to thick peptidoglycan layer which absorbs crystal violet.

#### Bacillus

[Rod](#)

This organism has a bacillus (rod) shape. After 26 hours it can often be visualized as an intermediate shape as cocci (sphere).

#### Intracellular

[In-a-cell](#)

*Listeria* is a facultative intracellular microbe that grows and reproduces inside host's cells.

#### Survives in Cold Temperature

[Lives in Frozen-cage](#)

*Listeria* is a tough organism that can survive in 4 degrees Celsius environment, which is why it is not hindered by refrigeration. This helps distinguish this organism from other gram-positive organisms.

#### Actin Rocket

[Actin rocket](#)

*Listeria monocytogenes* is a facultative intracellular microbe that grows and reproduces inside host's cells, and moves within eukaryotic cells by explosive polymerization of actin filaments called actin rockets.

#### Tumbling Motility

[Tumbleweed](#)

This organism exhibits a characteristic motility described as tumbling motility when viewed with light microscopy, which can help with identification.

#### Catalase-Positive

[Positive-cat](#)

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

### **Beta-Hemolytic**

#### **Beta-fish in Petri-dish**

Listeria expresses a beta hemolysin, which causes destruction of red blood cells forming a clear area of hemolysis on blood agar.

### **Only Gram-Positive with Endotoxin-Like Structure**

#### **Graham-cracker-Positive-angel holding Unpopped-toxic-balloon**

Listeria was initially thought to be unique among gram-positive bacteria because its cell wall appeared to be composed of lipopolysaccharides, which was believed to serve as an endotoxin. Later, it was classified as not a true endotoxin. In fact, the cell walls contain lipoteichoic acids, and not lipopolysaccharides, which they closely resemble. Thus, listeria are unique because of the endotoxin-like structure they possess, which is composed of lipoteichoic acids that resemble the lipopolysaccharide cell walls of gram negative bacteria.