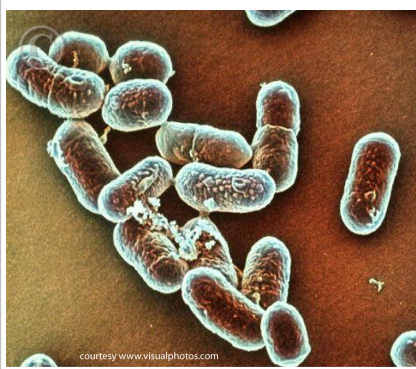


Listeria monocytogenes



Scanning electron micrograph of *Listeria monocytogenes* bacteria on the surface of blood agar.

Samples

Environmental Swabs preserved in sample buffer

Tissue Sample preserved in sample buffer

Fluid Specimens preserved in sample buffer

Notes: Send all samples at room temperature, preferably preserved in sample buffer ([sample submission](#))

Interpretation of PCR Results

Positive

(> 10 copies/ml,

> 4 copies/sample)

***Listeria monocytogenes* infection / contamination**

Negative

No *Listeria monocytogenes* infection

Listeria (L.) monocytogenes

Listeria (L.) monocytogenes is a gram-positive, facultatively anaerobic, non-spore-forming rod. The natural habitat is probably decomposing plant matter, but *L. monocytogenes* can be isolated from many environmental sources since it is a mesophilic bacterium that grows well at room temperature, and continues to slowly replicate even at refrigerator temperatures. Listeriosis is of major veterinary importance in domestic ruminants. Among a number of disease conditions in listeriosis, encephalitis and uterine infection with abortion are the most common and serious ones ([Low & Donachie, 2003](#)). The survival in the environment and replication at low temperatures make *L. monocytogenes* a major and one of the most lethal food-borne pathogens, particularly in dairy products ([Ramaswamy et al., 2007](#)). Contamination of cheese production facilities with milk from infected cows has caused numerous episodes of deadly human outbreaks of listeriosis with deaths of affected, typically immunocompromised individuals, and stillbirth or abortion.

Clinical Signs

L. monocytogenes infects animals, in particular ruminants, via lesion in the upper alimentary tract that result in many cases from uptake of frozen silage. Using infected leukocytes as vehicle, the bacteria invade the brain and cause encephalitis. Common symptoms include unilateral facial nerve paralysis resulting in salivation, twisting of the head, and walking in circles ([Low & Donachie, 2003](#)). Abortion in many animals, but mainly ruminants, is caused by invasion of the uterus and fetus. Similar symptoms are observed in humans after infection via contaminated dairy products ([Ramaswamy et al., 2007](#)).

Standard Diagnostic Methods

L. monocytogenes infections are usually diagnosed by isolating the organism from clinical or environmental samples by standard bacteriological culture on blood agar plates, frequently after cold-enrichment in the refrigerator. However, like all cultures, diagnosis is slow using this method, and more rapid diagnosis is possible using PCR techniques. Alternative technologies using fluorescent and antibody detection have also been developed, but are not highly sensitive.

Our Method

The Molecular Diagnostics Laboratory at Auburn University has developed a quantitative PCR technology targeting the internalinC (*inlC*) gene, a virulence marker for the attachment and internalization present only in pathogenic *L. monocytogenes* ([Mammina et al., 2009](#)). The PCR is designed and capable of detecting a single copy of this target gene in the PCR nucleic acid input.