



Listeria

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- The genus composed of six species three of which are pathogenic.
- ***L. monocytogenes* is the most important species**
- while *L. ivanovii* and *L. innocua* are less frequently pathogenic.

Diseases caused by *L. monocytogenes*

Species	Disease and signs
Sheep	Circling disease or listeriosis CNS manifestation, circling and tilting of the head with unilateral facial paralysis
cattle, sheep and goat	abortion (mostly in the last third of pregnancy) and mastitis
human	meningitis, encephalitis, abortion, endocarditis and septicaemia.

Laboratory diagnosis

Samples:

Nervous form: Living animal → CSF

Dead animals → brain tissues.

Aborted form: swaps from uterine discharges, placenta and cotyledons of the dam as well as brain, stomach content, liver and spleen of the aborted foetus.



- Cultural characters

- Aerobic or facultative anaerobic, grows at 4-45 °C (with opt. Temp. 30°C).
- For primary isolation, it requires 5-10% CO₂.
(the only pathogenic Gram positive bacteria can live in refrigerators)
- It can tolerate pH values between 5.5 and 9.6.
- Samples can be inoculated directly onto complex enriched media; as **blood agar and chocolate blood agar**, containing 1% dextrose; enhances their growth, and 0.05% potassium tellurite; prevents other contaminants especially Gram negative.

After incubation at 37°C for 24 hours, it shows small and smooth colonies with a narrow zone of β-haemolysis.

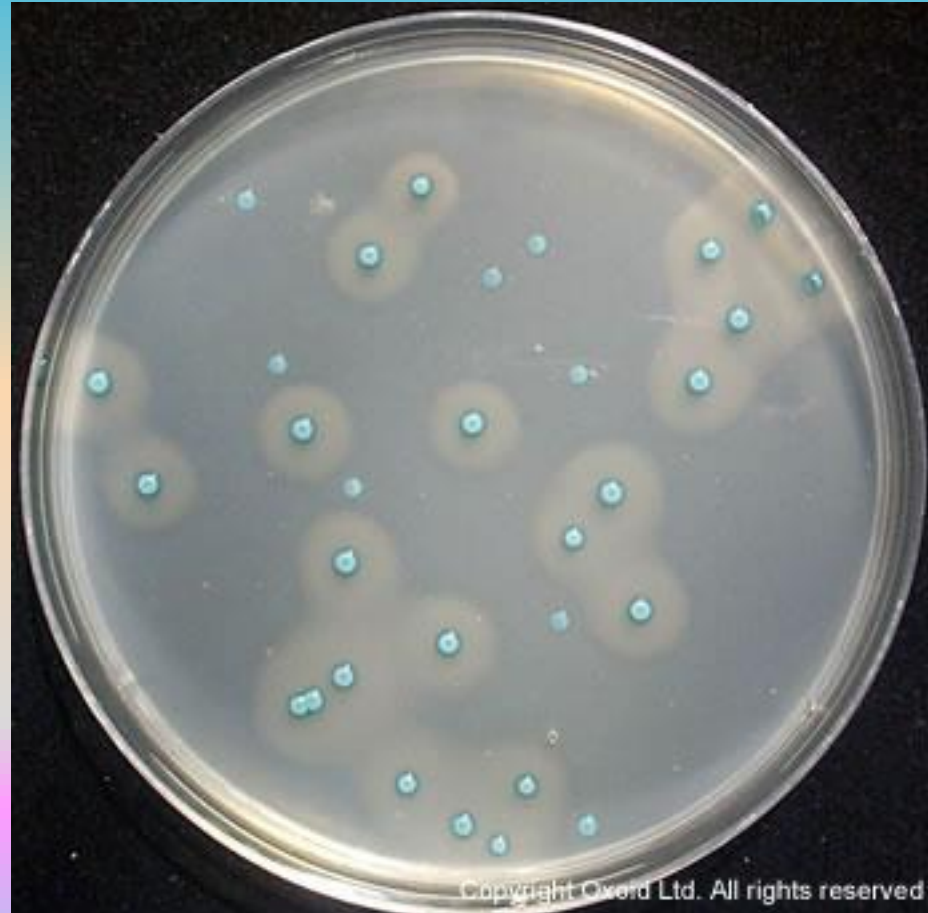
Oxford agar and brilliance listeria agar

Cultivation

Oxford agar



Listeria brilliance agar



Cold Enrichment:

it is necessary for isolation from brain tissues, which is difficult to be isolated due to presence intracellular. Samples are inoculated in nutrient broth and incubated at 4°C, in a refrigerator, and subcultured weekly onto blood agar for up to 12 weeks.

- **Morphology**

- Gram positive, motile, non spore former coccobacilli arranged in chains or take the palisade appearance.
- Motility appears at room temperature (25°C) if incubated in broth for 2-4 hours exhibiting a characteristic tumbling motility.
- When cultured in nutrient broth at 20-25°C for 6-20 hours, a characteristic tumbling motility is shown where fast rotations in one place are followed by quick movements in different directions and again continued by rotations. Since the development of flagella is very weak at 37°C, motility studies are best done at room temperature



3. Biochemical characteristics:

Catalase positive and oxidase negative.

Ferment glucose but not ferment mannitol.

MR& VP tests are all positive.

CAMP test is positive with *S. aureus*

4. Pathogenicity to laboratory animals:

G. pigs and rabbits are the most susceptible laboratory animals.

It causes death of G. pigs and rabbits within 3-4 days with formation of liver necrosis and micro-abscesses in the brain. Blood smears reveals increased number of monocytes (**monocytosis**).

Monocytosis is usually seen in experimentally laboratory animals, but regularly seen in natural disease.

Anton's Test:

Instillation of young broth culture; 24-36 hours, of *L. monocytogenes* into one eye of rabbit (the second is control) induces a pathognomonic keratoconjunctivitis after 24 hours.