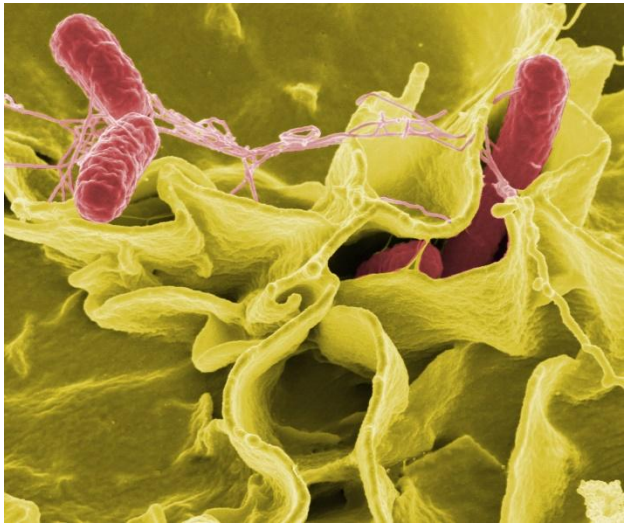
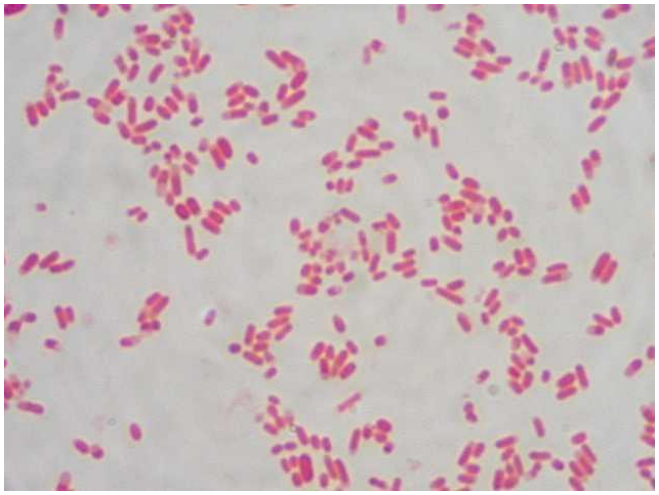
SALMONELLOSE INFECTIONS. Microbiological characteristic and diagnostic.

Family: Enterobacteriaceae
Genus: Salmonella spp.





Salmonella sp. Gram stain

Characteristic: facultative anaerobes, gram-negative bacillus with size 2-4 x 0,5 microns. They are mobile due to the presence of peritrichrally located flagella.

Specialty: Infectious disease

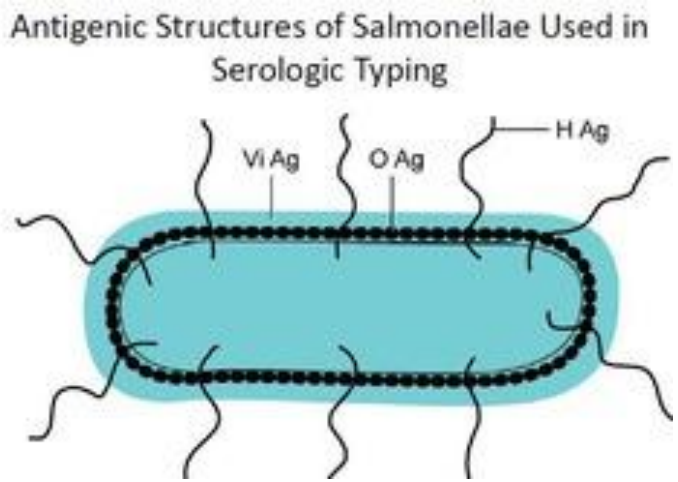
Symptoms: Diarrhea, fever, abdominal cramps, vomiting

Biochemical properties: Do not fermente lactose or sucrose, produce acid and gas from glucose – S. typhi is gas negative, produce H_2S.

Factors virulence of Salmonella

1. Factors of adhesion and colonization.

2. Ability to intracellular parasitism, to prevent phagocytosis, to multiply in cells of lymphoid tissue are expressed in pathogens of typhoid fever, paratyphoid A and B, contributing to chronic carrier.



3. Endotoxin (LPS).

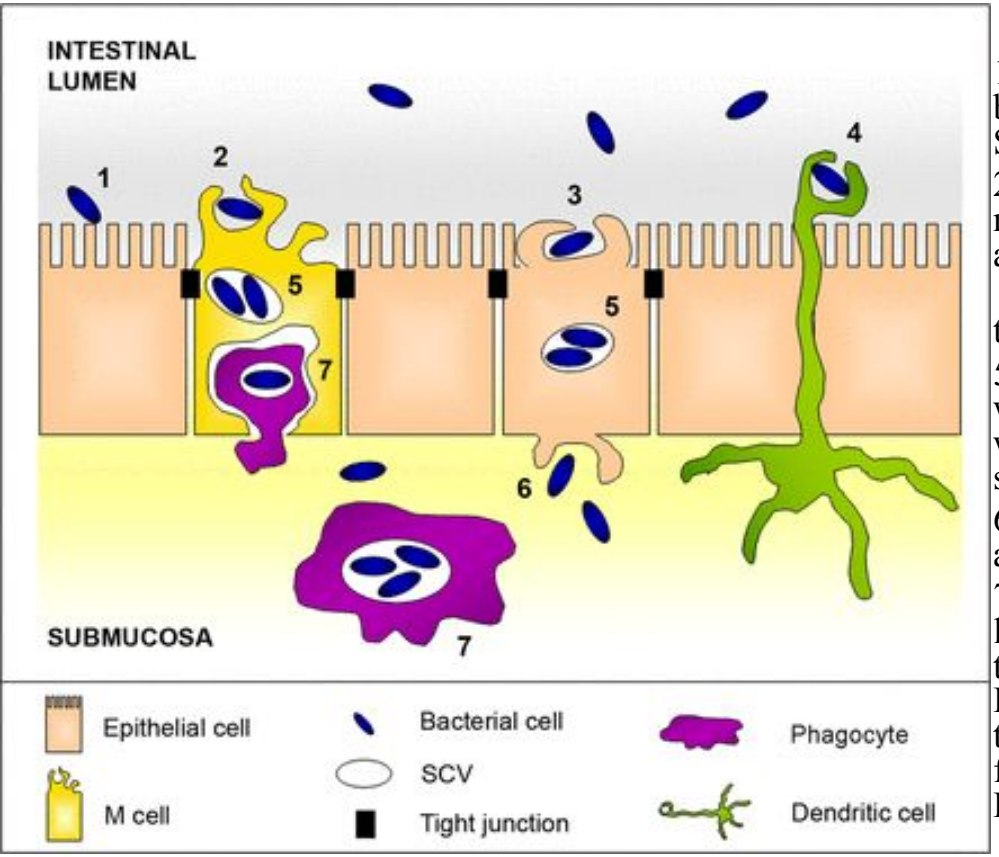
4. Thermolabile and thermostable enterotoxins.

5. Cytotoxins.

6. Plasmids of virulence and R-plasmids are of significant importance.

7. Vi - antigen inhibits the action of serum and phagocytic bacteriocidal factors.

Pathogenesis model of *Salmonella enterica* serovar Typhimurium.



1, *Salmonella* cells attach to the intestinal epithelium by means of adhesins, such as those encoded within SPI-3 and SPI-4.

2 and 3, Invasion of bacteria follows, and engulfment is mediated by virulence factors encoded within SPI-1 and SPI-5.

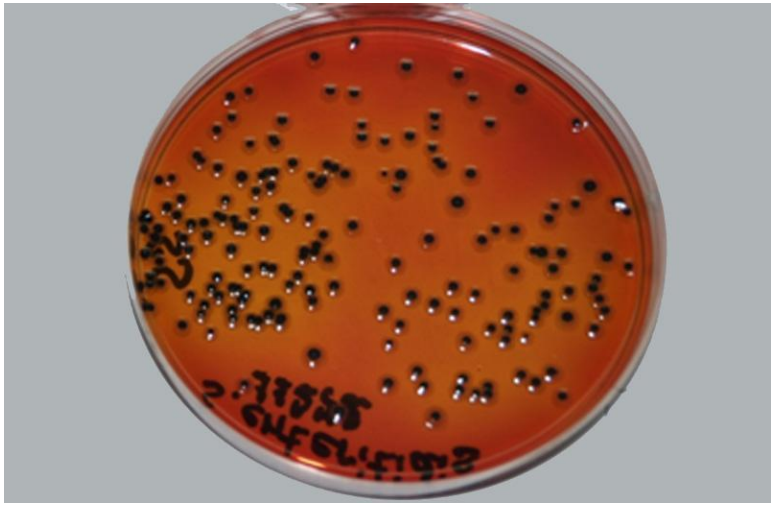
4, Alternatively, bacterial cells can also be directly taken up by dendritic cells from the submucosa.

5, Once inside the cytoplasm, *Salmonella* is localized within the SCV, where it replicates. Factors encoded within SPI-2 and the pSLT plasmid are essential for survival.

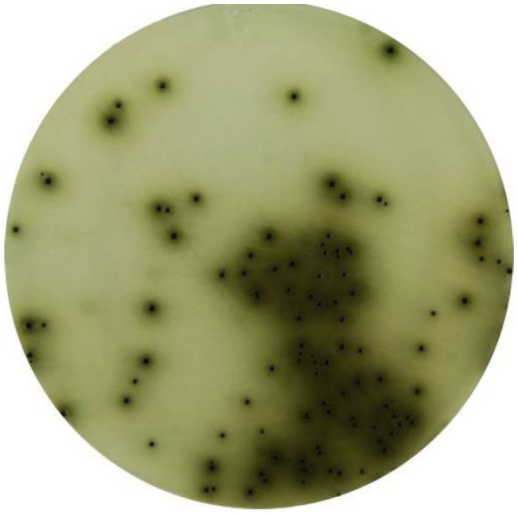
6, The SCVs transcytose to the basolateral membrane and release the internal cells to the submucosa.

7, Bacteria are internalized within phagocytes and located again within an SCV, where SPI-3, in addition to SPI-2 and the pSLT plasmid, play an important role. Lastly, these infected phagocytes can disseminate through the lymph and the bloodstream. (Modified from reference 347 with permission from the BMJ Publishing Group.)

Cultural properties of Salmonella sp.



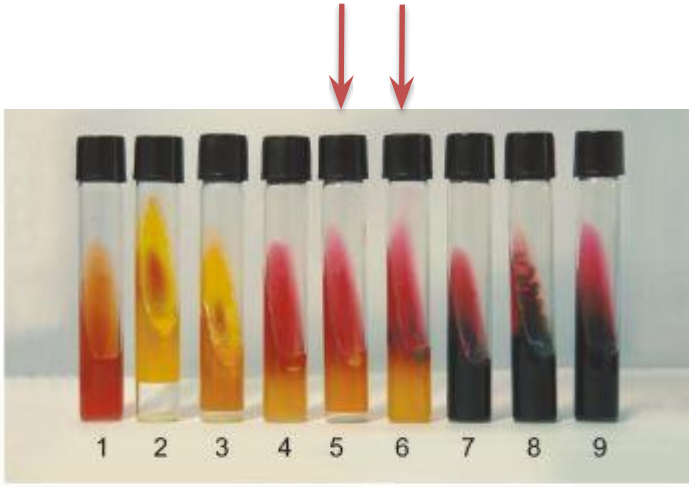
Ploskireva medium



Bismuth sulfite agar

Growth on medium Endo

Kligler iron agar



Kligler Iron Agar (M078)

1. Control
2. Escherichia coli ATCC 25922
3. Enterobacter aerogenes ATCC 13048
4. Shigella flexneri ATCC 12022
5. Salmonella Paratyphi A ATCC 9150
6. Salmonella Typhi ATCC 6539
7. Proteus vulgaris ATCC 6380
8. Citrobacter freundii ATCC 8090
9. Salmonella Enteritidis ATCC 13076

Change in color to yellow (acidification) - LACTOSE AND Sucrose FERMENTATION

Blackening of the environment - PRODUCTION OF H2S

Changes in coloring to yellow (acidification) - FERMENTATION OF GLUCOSE TO ACID. The same + gas - FERMENTATION of glucose to acid and gas.

Change in color on bright crimson (alkalinization) - FERMENTATION of the ureter.

Glucose	**Lactose**	**Sucrose**	**H2S**	**Urea**
+	-	-	+	-

Principles classification of Salmonella

The genus *Salmonella* is part of the family of Enterobacteriaceae. Its taxonomy has been revised and has the potential to confuse. The genus comprises two species, *Salmonella bongori* and *Salmonella enterica*, the latter of which is divided into six subspecies: *S. e. enterica*, *S. e. salamae*, *S. e. arizonae*, *S. e. diarizonae*, *S. e. houtenae*, and *S. e. indica.*The taxonomic group contains more than 2500 serotypes (also serovars) defined on the basis of the somatic O (lipopolysaccharide) and flagellar H antigens (the Kauffman–White classification). The full name of a serotype is given as, for example, *Salmonella enterica* subsp. *enterica* serotype Typhimurium, but can be abbreviated to *Salmonella* Typhimurium. Further differentiation of strains to assist clinical and epidemiological investigation may be achieved by antibiotic sensitivity testing and by other molecular biology techniques such as pulsed-field gel electrophoresis, multilocus sequence typing, and, increasingly, whole genome sequencing. Historically, salmonellae have been clinically categorized as invasive (typhoidal) or noninvasive (nontyphoidal salmonellae) based on host preference and disease manifestations in humans.

Typhoid fever

A bacterial infection due to *Salmonella* typhi that causes symptoms.

- Symptoms may vary from mild to severe and usually begin six to thirty days after exposure. Often there is a gradual onset of a high fever over several days.
- Weakness, abdominal pain, constipation, and headaches also commonly occur.
- Diarrhea is uncommon and vomiting is not usually severe.
- Some people develop a skin rash with rose colored spots. In severe cases there may be confusion.
- Without Other people may carry the bacterium without being affected; however, they are still able to spread the disease to others.
- Typhoid fever is a type of enteric fever along with paratyphoid fever.

Lab diagnostics

The period from the start of the sickness	**Period of the diseases**	**TEST MATERIAL**
The 1st week	Bacteremia	Sowing blood, RPHA with Vi-antigen
The 2nd to 3rd weeks	Flush of diseases	Sowing of blood, feces, urine in plate. ELISA of blood with Vi, O and H antigens
The 3rd to 4th weeks	Convalescent	Sowing of feces, urine, bile. ELISA of blood with O and H antigens