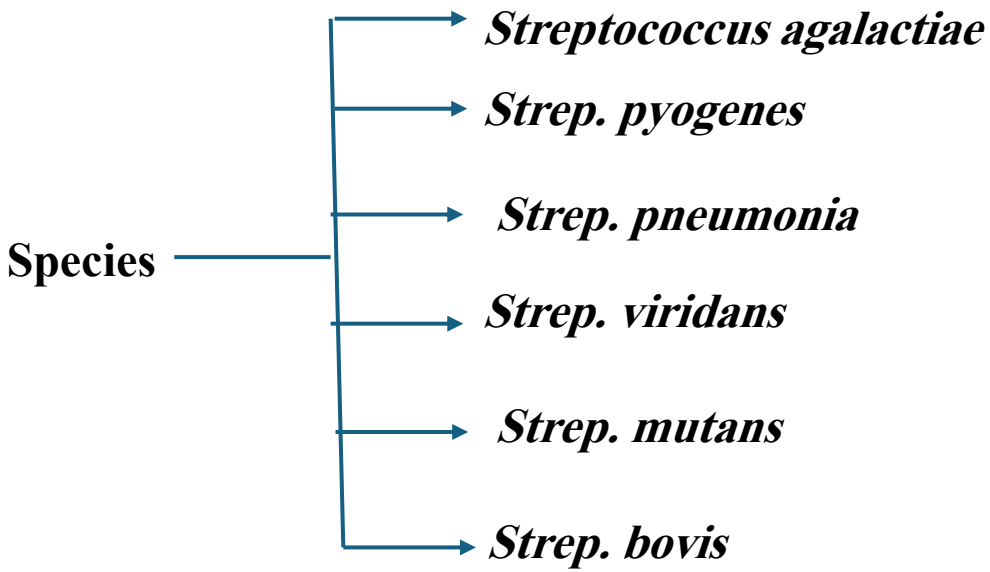
Bactria Classification

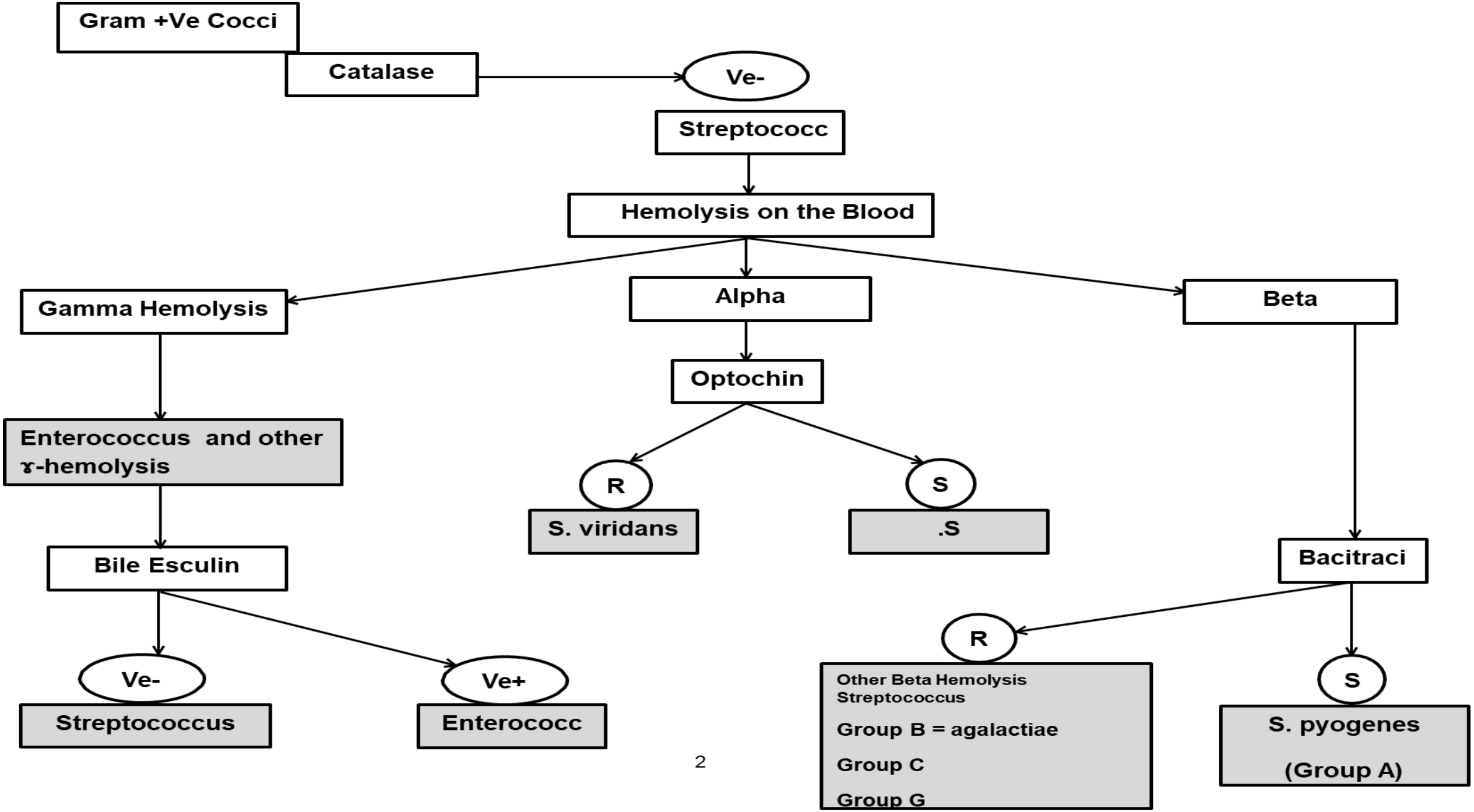
Streptococcus Spp.

Lab 2

Scientific Classification of Streptococcus Spp.

- **Domain: Bacteria**
- **Phylum: Firmicutes**
- **Class: Bacilli**
- **Order: Lactobacillales**
- **Family: Streptococcaceae**
- **Genus: Streptococcus . . . . . include at least 77 species.**




Gram +Ve Cocci
Catalase
Ve-
Streptococc
Hemolysis on the Blood
Gamma Hemolysis
Alpha
Beta
Optochin
Enterococcus and other ɤ-hemolysis
R
S
S. viridans
.S
Bile Esculin
Bacitraci
Ve-
Ve+
R
S
Streptococcus
Enterococc
Other Beta Hemolysis Streptococcus
Group B = agalactiae
Group C
Group G
S. pyogenes
(Group A)

Blood Agar

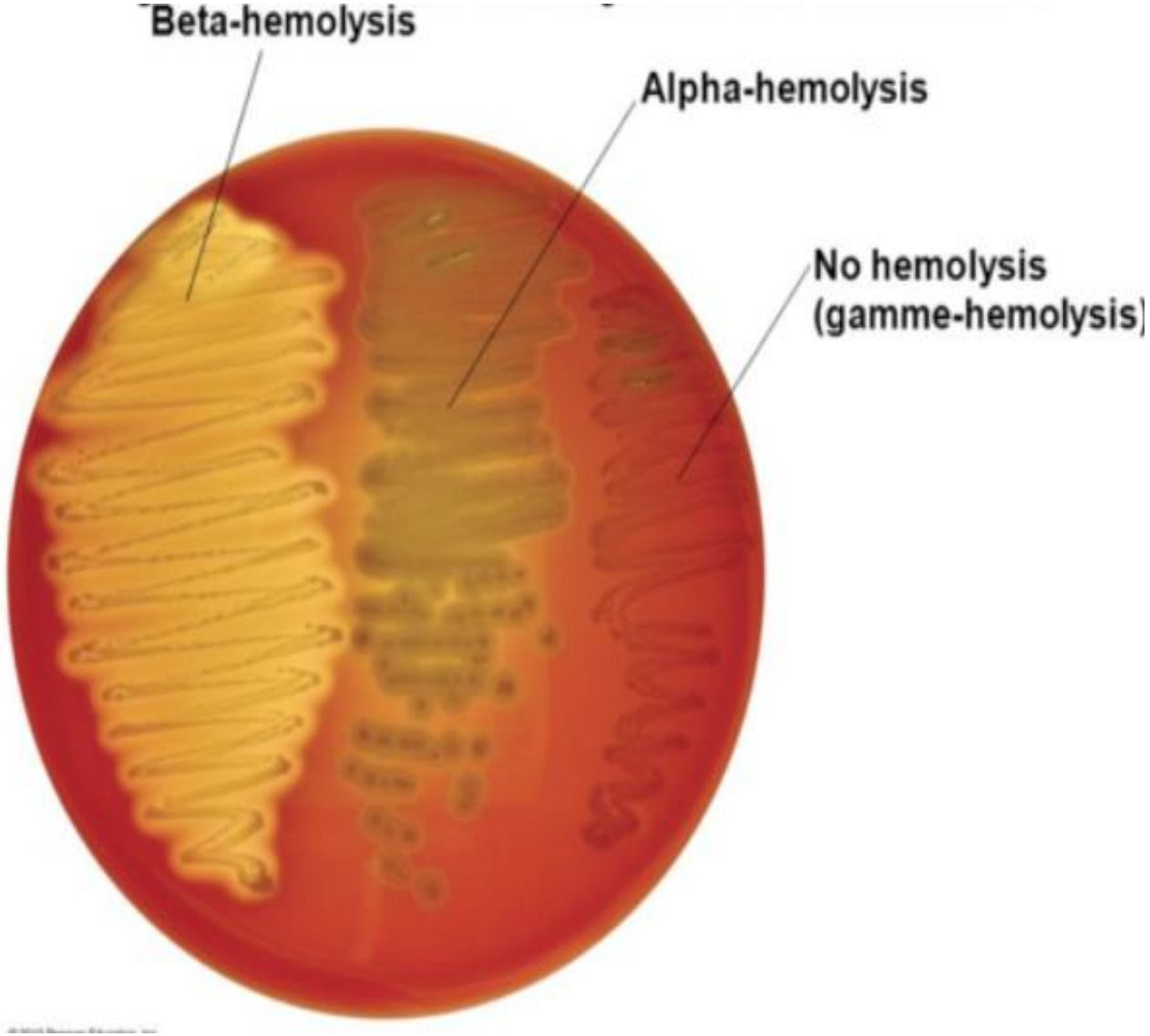
Several species of Gram-positive cocci produce exotoxins called Hemolysins, which are able to destroy red blood cells (RBCs) and hemoglobin. Blood Agar, sometimes called Sheep Blood Agar because it includes 5% sheep blood in a Tryptic Soy Agar base, allows differentiation of bacteria based on their ability to hemolysis RBCs.

The three major types of hemolysis are β-hemolysis, α-hemolysis, and ɣ-hemolysis.

- **α-hemolysis is the partial destruction of RBCs and produces a greenish discoloration of the agar around the colonies**

- **β-hemolysis, the complete destruction of RBCs and hemoglobin, results in a clearing of the medium around the colonies.**

- **ɤ-hemolysis is non hemolysis and appears as simple growth with no change to the medium.**



Hemolysins produced by streptococci are called streptolysins. They come in two forms- type O and type S. Streptolysin

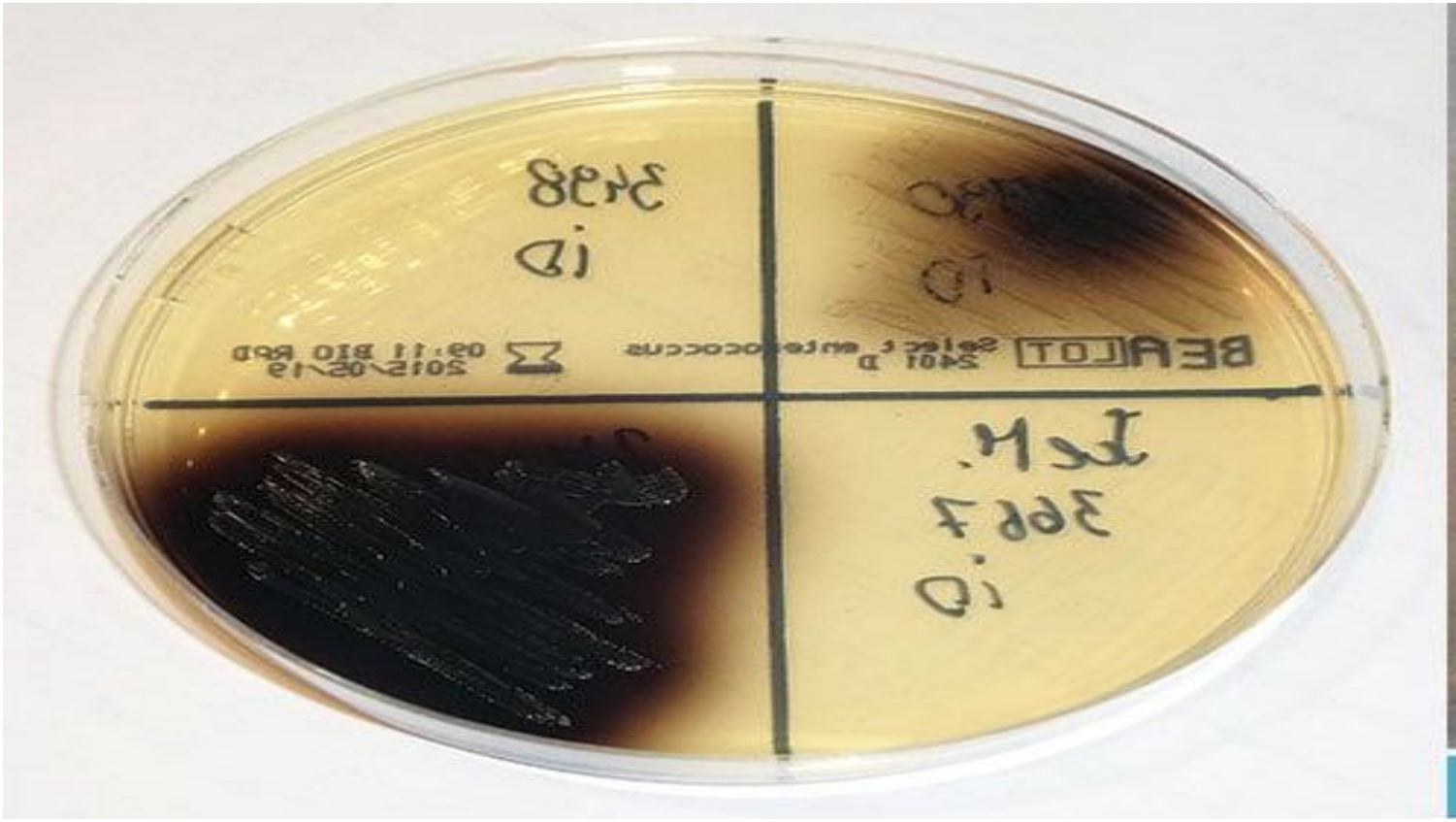
- **Streptolysin O: is oxygen-labile and expresses maximal activity under anaerobic conditions.**
- **Streptolysin S: is oxygen-stable but expresses itself optimally under an aerobic conditions as well.**

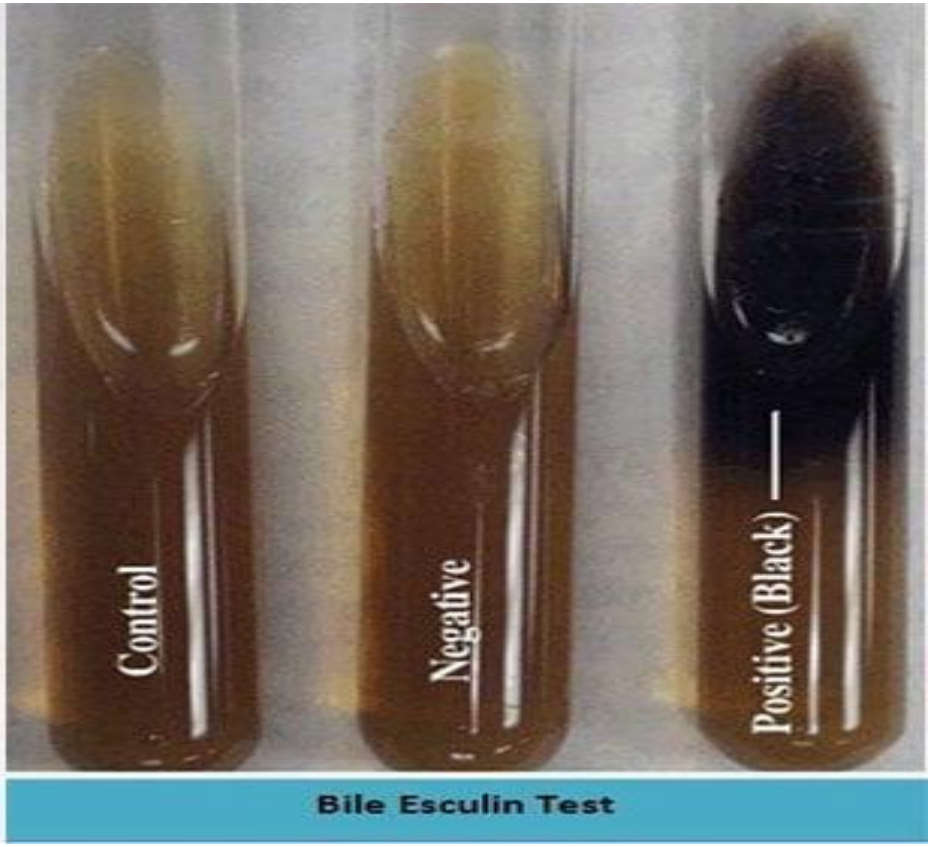
***The easiest method of providing an environment favorable for streptolysins on Blood Agar is what is called the Streak–stab technique.**

In this procedure the Blood Agar plate is streaked for isolation and then stabbed with a loop. The stabs encourage streptolysin activity because of the reduced oxygen concentration of the subsurface environment.

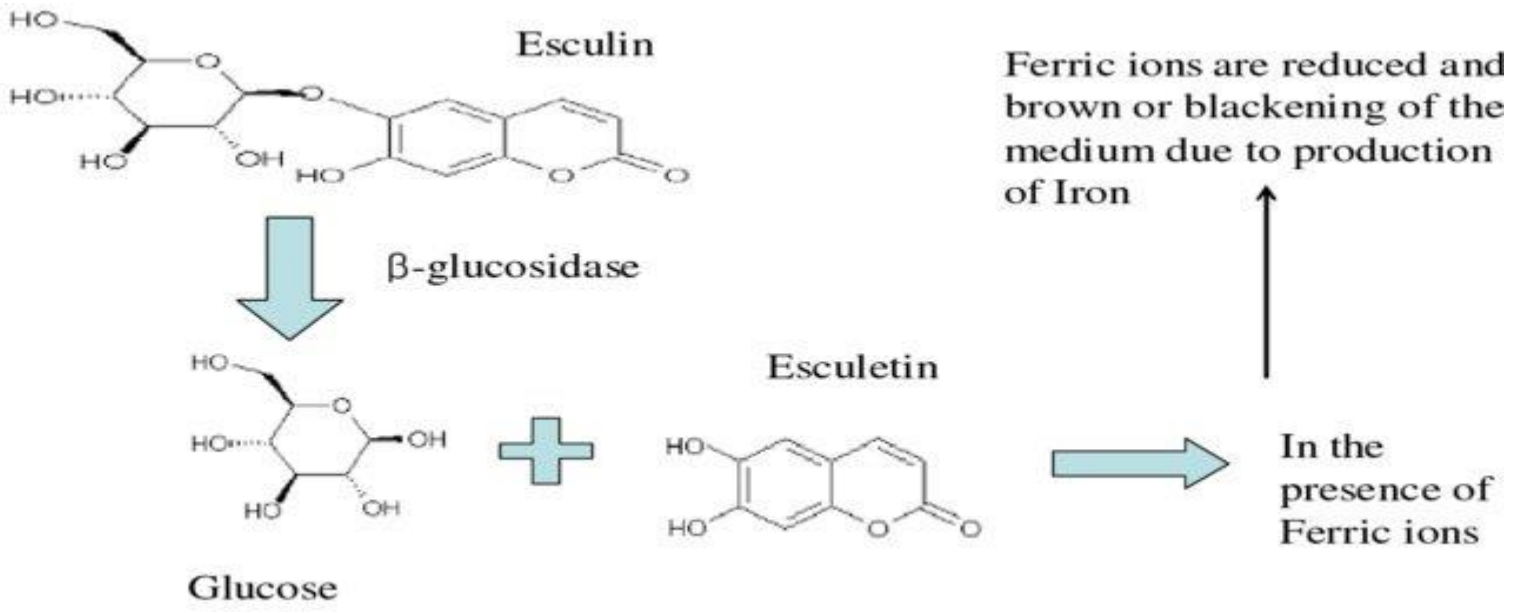
The major use of Bile Aesculin Agar

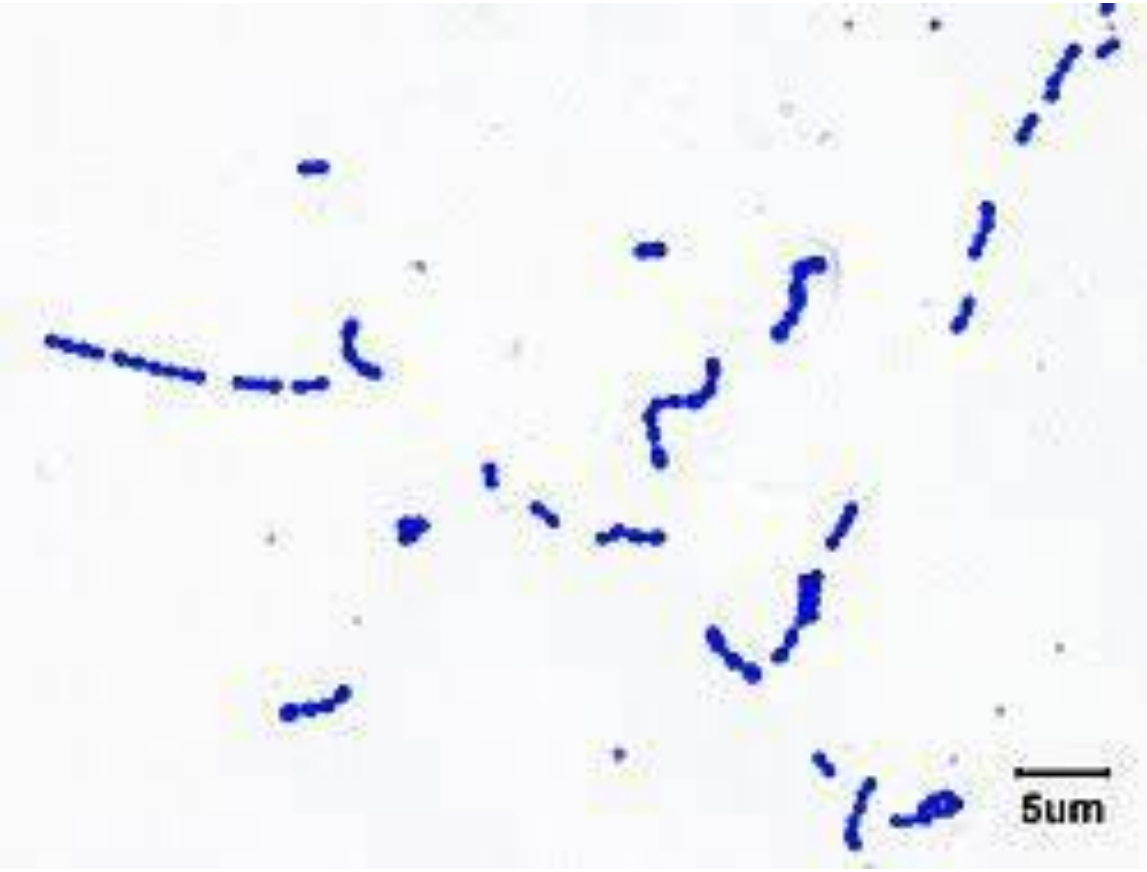
is to differentiate between enterococci / Group D *streptococci* (*Enterococcus*: *E. faecalis* and *E. faecium*) and non-Group D streptococci. It may also be used for the presumptive identification of other groups of organisms.



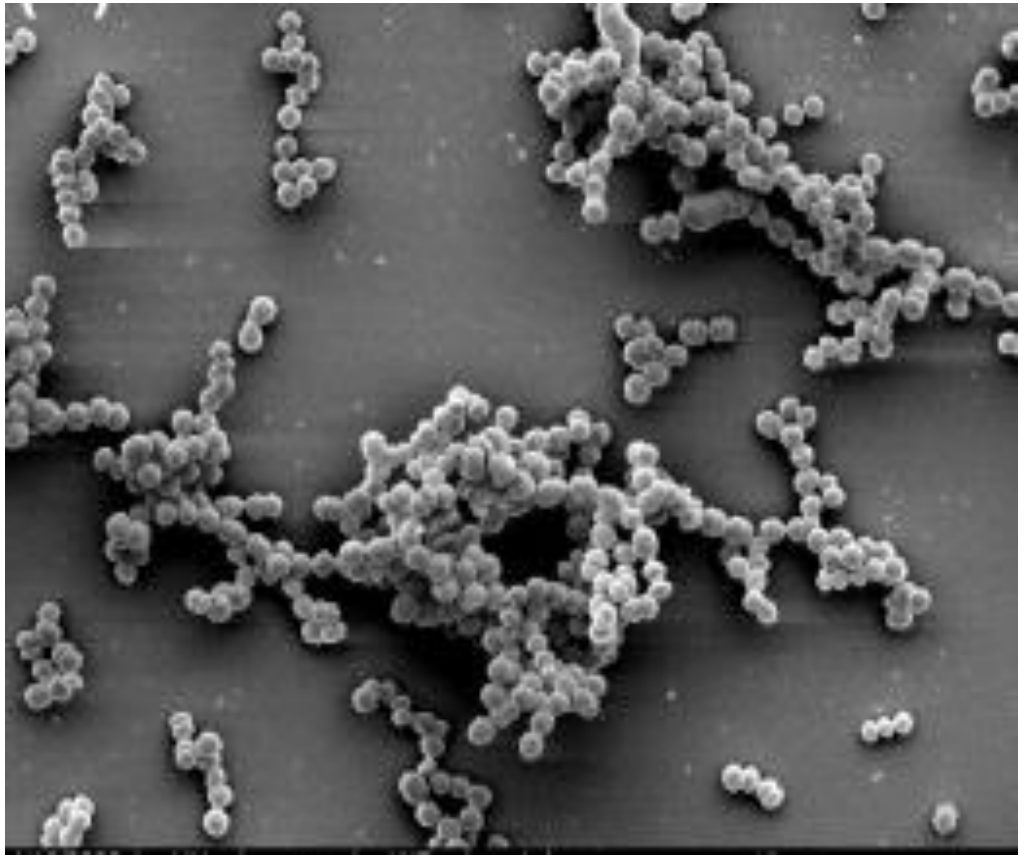


Enterococci / Group D streptococci hydrolyse aesculin to form aesculetin and dextrose. Aesculetin combines with ferric citrate in the medium to form a dark brown or black complex which is indicative of a positive result. Bile salts will inhibit Gram-positive bacteria other than enterococci / Group D streptococci. The value of bile tolerance together with hydrolysis of aesculin as a means of presumptively identifying enterococci / Group D streptococci is widely recognized.



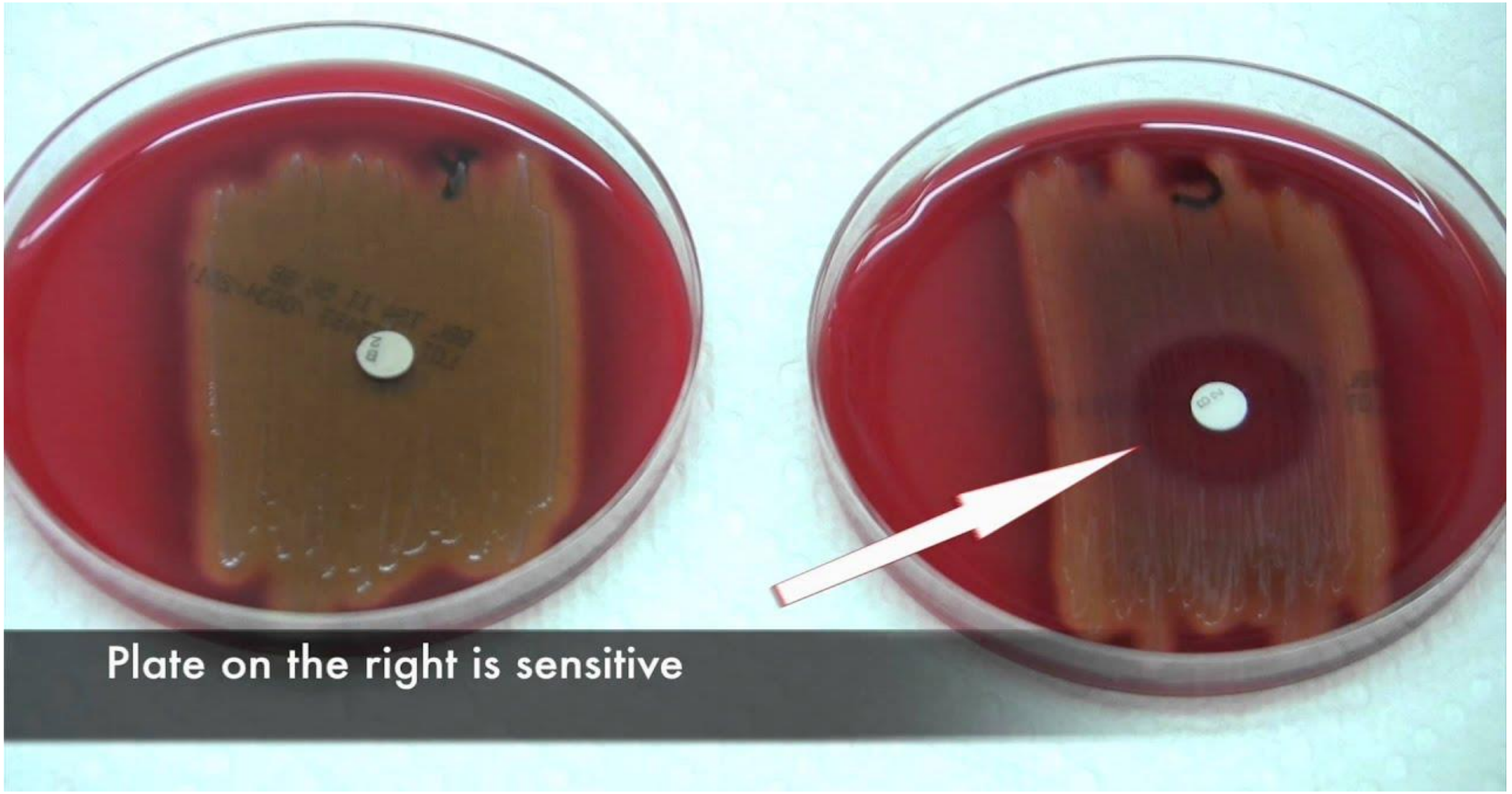


Streptococcus under light microscope



Streptococcus under electronic microscope

Optochin disk test



Bacitracin test