

Medical Bacteriology

The pathogenic organisms may be one of the following:

1-cellular.

Fungi and bacteria

Fungi: It is true cell, contains true nucleus (i.e. nucleus is separated from cytoplasm).

Bacteria: Prokaryotic cell (primitive cell with primitive nucleus i.e. nucleoplasm).

2- Non cellular

Virus: contain either DNA or RNA.

Kingdom: Procaryotae

Division 1: Firmicutes

Characterized by strong cell wall (peptidoglycane 40-60%), Gram positive bacteria.

Class1: Firmibacteria (simple gram positive bacteria)

Section 1: gram positive cocci

Section 2: gram positive spore forming rods (bacilli).

Section 3: gram positive non spore forming rods (bacilli).

Class2: Thallobacteria (Gram positive filamentous bacteria)

- Mycobacterium
- Coryneform group

- Nocardia
- Streptomyces
- Actinomyces.

Division 2: Gracilicutes (Scot bacteria)

Characterized by thin cell wall (peptidoglycane 10-20%), Gram negative bacteria.

Division 3: Tenericutes(Mycoplasma).

General character of prokaryotes.

1-Has primitive nucleus (nucleus is not separated from cytoplasm).

2-Characterized by rigid cell wall (contain peptidoglycane).

Gram positive cocci

Aerobic cocci

G:Micrococcus

facultative anaerobic

G:Staphylococcus

G:Streptococcus

Anaerobic cocci

G: peptostreptococcus

	G:Staphylococcus	G:Streptococcus	G:Micrococcus
1-Type	Facultative anaerobic	Facultative anaerobic	Aerobic cocci
2-Morphology	Grapes like clusters	chain	tretrads
3- biochemical identification			
a-catalase	+	-	+
b-Oxidative			

fermentative test			
-open fermentation	+	+	+
-close fermentation	+	+	-
c-Furazalidone sensitivity	S(can't grow)	S/R	R
d-Bacitracin	R	S/R	S

1- Furazalidone sensitivity:FTOtest:

It is the ability of organism to grow in the presence of antibacterial agent termed furazulidone 20µg/ml

2- Oxidative – fermentation test

Using 2 test tube containing glucose media

1st cultivate microbe & seal tube with paraffin layer

2nd cultivate microbe & let the tube opened

After cultivation of the test tubes notice the glucose fermentation

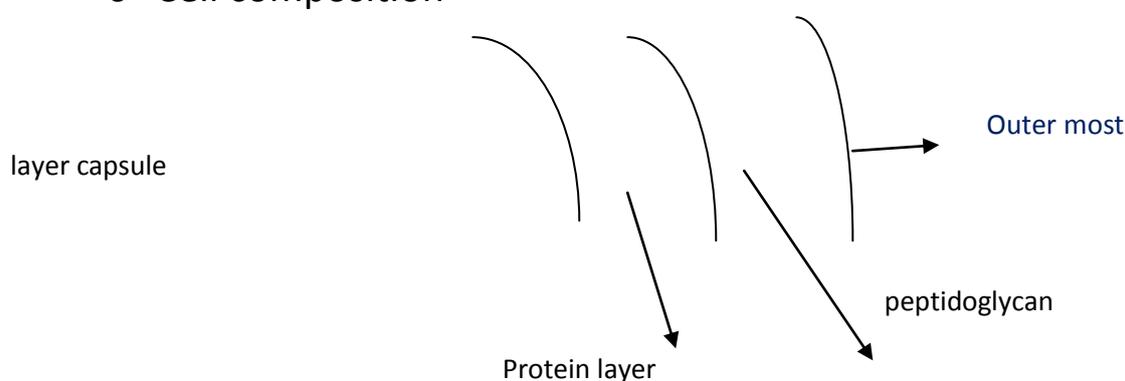
3-Bacitracin inhibition test

Incubate of the microbe with bacitracin disc 0.04 micro disc

Genus :Staphylococcus

General character of the genus

- 1- Gram positive, Facultative anaerobic.
- 2- Cocci arranged either (grape like cluster)
- 3- Non motile organism-non sporulating.
- 4- Biochemical reaction as in table1
- 5- Either capsulated or non capsulated
- 6- Cell composition



a-Proteinous layer in the cell wall composition

Staphylococcus protein A (SPA): only restricted to the most pathogenic species of *Staphylococci* especially *Staphylococcus aureus* .

- SPA is a major cell component of *Staph. aureus* mainly human strains

Importance of SPA

1. Marking of antibodies

SPA+AbSPA attached to the Fc portion of the antibody so it is important in marking appear in detection of infection

3- Has antitumor activity

SPA inhibit growth of tumor through inhibition of the immunocomplexes given a chance for Ab to attach tumor cell.

SPA antitumor activity nearly equal to that of the interferon

Detection of protein A

Protein A present in 95% of *Staph. aureus*

1- AGP test

White line of precipitation indicate positive result

2- Hemoagglutination

If the sensitized RBCs which carry antibodies attached to the *Staphylococci* it indicates positive result.

Types of protein A

- 1- Extracellular 1/3.
- 2- Bound SPA to cell wall 2/3