

Gram-Positive Cocci

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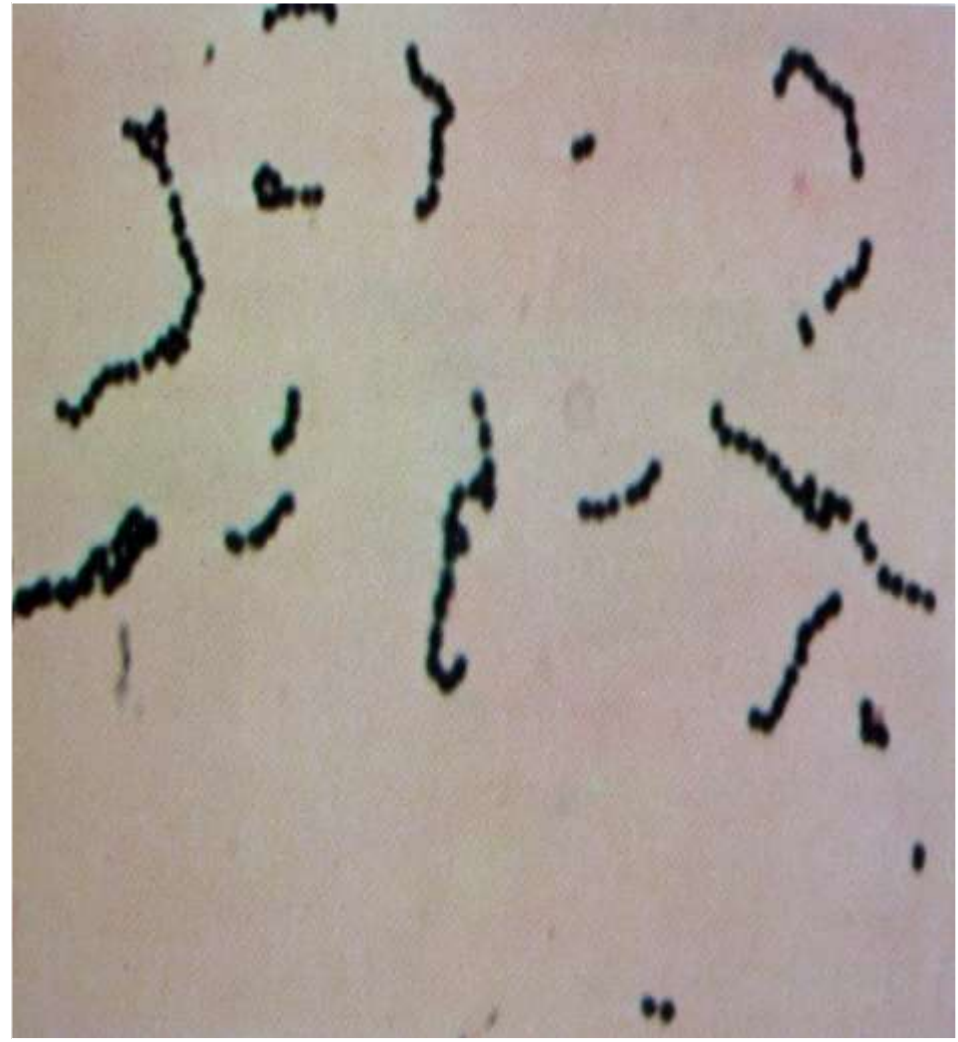
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Gram-positive cocci

- Micrococcaceae family.. Facultative Anaerobic Gram-positive cocci .. includes the following Genera/Groups:
- Staphylococcus.. Arranged in Irregular Clusters ..Catalase+ve
- Streptococci.. Arranged in Diplococci or Chain of Cocci.. Catalase-ve
- Enterococci.. Arranged in Diplococci & Short Chain.. Catalase-ve
- The Two Common ***Staphylococcus*** species are: ***S. aureus***.. ***S. epidermidis*** are common in skin, nose, oral cavity. other body sites.

Stapylococci-Streptococci



Pathogenicity of *S. aureus*

- More **invasive & pathogenic** than other Staph. species
- Contains capsule, cell wall antigenic structure
Polysaccharides.. Protein A.. Production Specific Enzymes & Exo- & Enterotoxins.. **Food Poisoning Coagulase & Clumping factor +ve**.. Both converted prothrombin into fibrin & fibrinogen .. Deposit fibrin during infection..
Hyaluronidase.. Spreading factor, **Leukocidin**.. destroy WBCs.. formation of pus and acne
- A common cause of skin abscess ..wounds, sepsis/ bacteremia, sinusitis, conjunctivitis pneumonia, meningitis, osteomyelitis & any body sites.

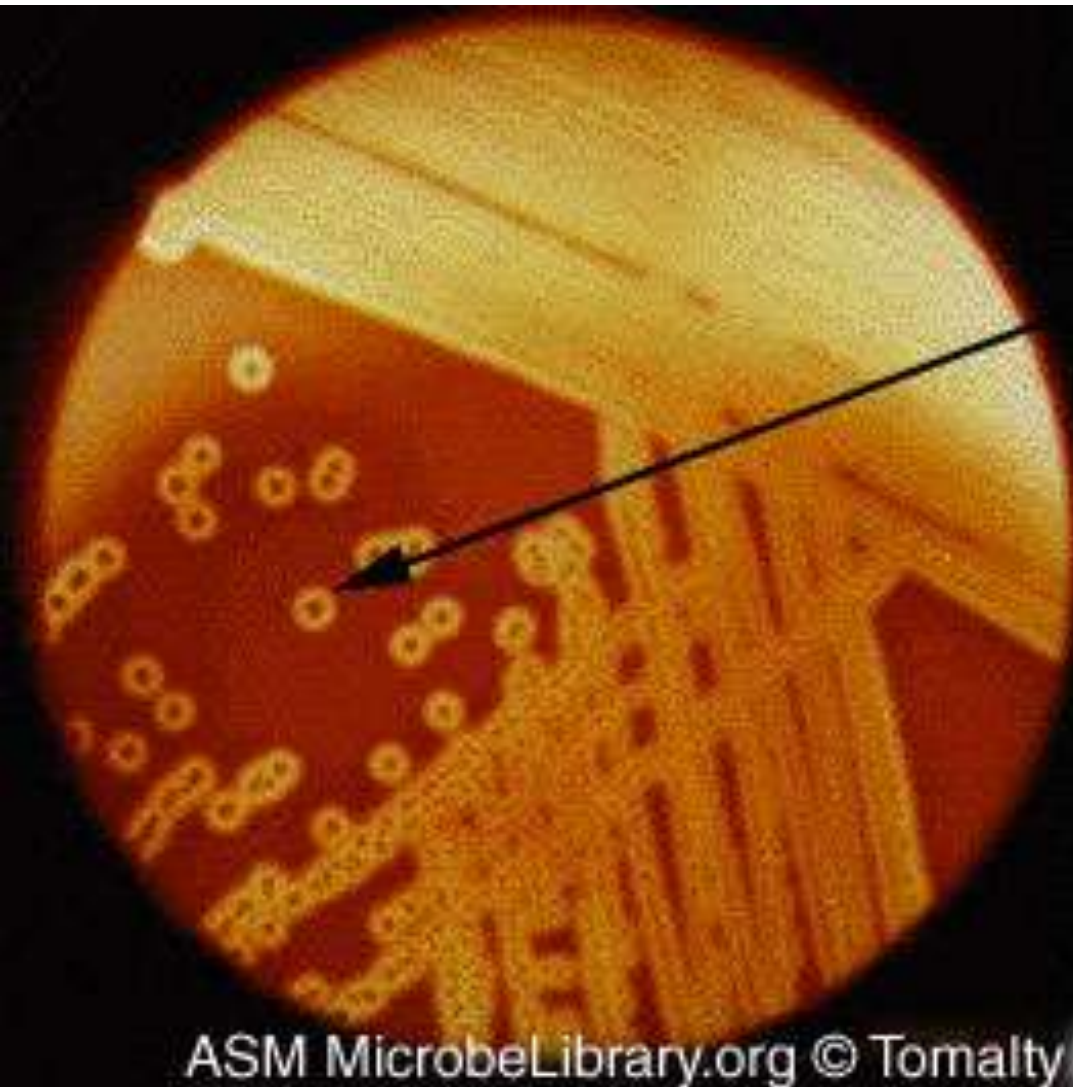
S. epidermidis

- Less pathogenic.. part body normal flora.. coagulase -ve.. opportunistic pathogen.. Bacteremia.. Skin abscess.
- **Diagnosis:** Collect specimens ..Culture & identification of isolates by gram-stain, catalase & coagulase test, susceptibility test..
- Most *S. aureus* strains.. Less *S. epidermidis* are **resistant to all B-lactams**.. Increase rate of isolation Methicillin/Oxacillin-resistant *S. aureus* (MRSA).. All still susceptible to vancomycin.
- **Micrococcus species:** common on skin.. coagulase -ve.. opportunistic pathogen.. Immuno-compromised patients.. mostly susceptible to B-Lactams.

Streptococci-1

- **Viridans Streptococci Group**: Alpha-hemolytic/ Non-Hemolytic.. Normal respiratory flora.. Oral cavity.. opportunistic pathogen, Dental caries, Sepsis, Localized oral abscesses.. Common Endocarditis
- **Beta-hemolytic Streptococci Group**: Serogroups A, B, C, D, F, G.. Cell wall specific carbohydrates.. Respiratory flora.. 2-30 %Healthy Carries.. Population
- **Group A Hemolytic Streptococci (S. pyogenes)**: Most invasive & Pathogenic.. Virulence Factors.. Cell Wall antigens/ M Proteins.. Many Extracellular Enzymes.. Hemolysins, **80 Specific subtypes**, Pyrogenic /Erythrogenic Toxin.. Superficial skin infection.. Scarlet fever.. Children..No Vaccine

Beta-Hemolytic Streptococcus-Susceptible for Bacitracin



Note the clear zone of beta-hemolysis surrounding the *Streptococcus* colonies when grown on blood agar.

Streptococci-2

- **Group A streptococcal** infections affect all ages with peak incidence at 5-15 years of age.. Acute Sore throat/ Pharyngitis, Skin infection, Sepsis, Otitis media, Sinusitis, Meningitis.. Less Adults.. Few Healthy carriers.
- **Complications:** A) Rheumatic Fever.. inflammatory disease affecting primarily the heart and joints. B) Glomerulonephritis.. immune complex disease of the kidney
- **Group B Streptococci**: Common in vaginal tract.. Purperal Sepsis, Neonatal Meningitis, Fatal ..Urinary Tract Infection.

Streptococci-3

- **Streptococci pneumoniae**: Capsule.. polysacharides 85 Serotypes.. Healthy Carriers
- Common cause of bacterial pneumonia.. more common in the very young and the very old persons.
- Common cause of meningitis, Sinusitis, Otitis Media, Bacteremia.. Young children.. Immunocompromised persons.. up 50% S. pneumonia R-Penicillin.. Specific Vaccine for Adults .. Children.. Protective 1-2-year.
- **S. pneumoniae** can be differentiated from *S.viridans*, which is also alpha hemolytic, using an Optochin test,
- **Enterococcus**: *E. fecalis*, *E. faecium*.. Common Intestine Human-Animal.. opportunistic pathogen.. Urinary Tract Infect., Wound, Rare Sepsis, Endocarditis..

***S. pneumoniae* - Susceptible to Optochin in Lab test**

