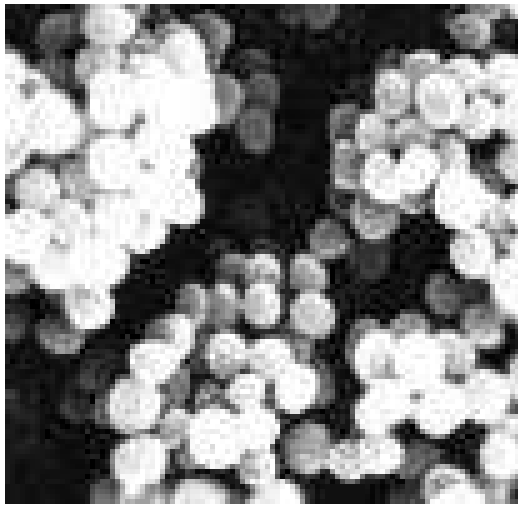


The Staphylococci

(*Staphyle* = bunch ; *coccus* = berry or grapes)



- Gram positive
- Spherical
- Microscopic clusters
- Catalase production
Facultative anaerobes
- Widely colonize:
 - mucosal surfaces (mouth, nose & throat)
 - and skin

The Staphylococci

- Staphylococcus aureus,
- **Coagulase +**
- 30 other species
 - **No coagulase**

Staphylococcus aureus

Genus: Staphylococci

Main diagnostic features

Infections caused by <i>Staph. aureus</i>	
Pyogenic infections	Toxin-mediated infections
Boils, carbuncles Wound infection Abscesses Impetigo Mastitis Bacteraemia Osteomyelitis Pneumonia Endocarditis	Scalded skin syndrome Pemphigus neonatorum Toxic shock syndrome Food poisoning

Pathogenesis

- Where and who?
- How?

Taxonomy: Staphylococcus

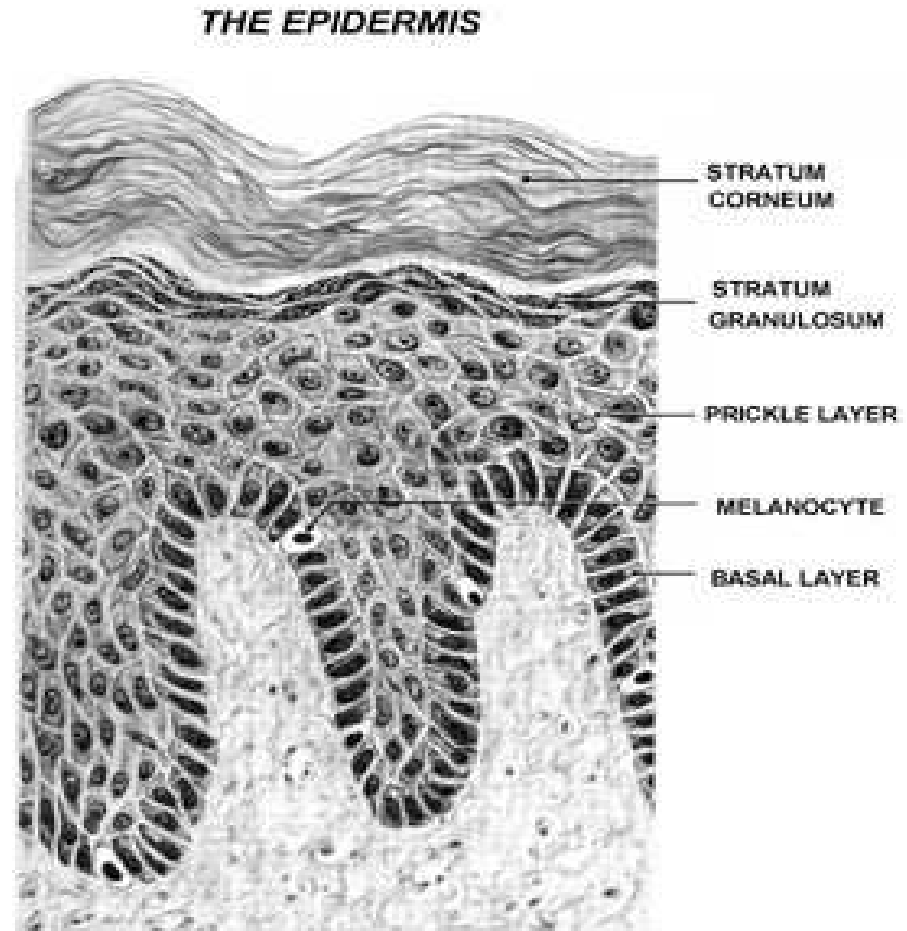
- Micrococcaceae

Some virulence factors of <i>Staph. aureus</i>	
Virulence factor	Activity
Cell wall polymers	
Peptidoglycan	Inhibits inflammatory response; endotoxin-like activity
Teichoic acid	Phage adsorption; reservoir of bound divalent cations
Cell surface proteins	
Protein A	Reacts with Fc region of IgG
Clumping factor	Binds to fibrinogen
Fibronectin-binding protein	Binds to fibronectin
Exoproteins	
α -Lysin	} Impairment of membrane permeability; cytotoxic effects on phagocytic and tissue cells
β -Lysin	
γ -Lysin	
δ -Lysin	
Panton-Valentine leucocidin	
Epidermolytic toxins	Cause blistering of skin
Toxic shock syndrome toxin	Induces multisystem effects; superantigen effects
Enterotoxins	Induce vomiting and diarrhoea; superantigen effects
Coagulase	Converts fibrinogen to fibrin in plasma
Staphylokinase	Degrades fibrin
Lipase	Degrades lipid
Deoxyribonuclease	Degrades DNA

Genus: Staphylococci

Staphylococcal toxins

- Superantigens
- Epidermolytic toxins A and B



Epidemiology

Sources of Infection

- Infected lesions
- Healthy carriers
- Animals

Epidemiology

Modes of Infection

Laboratory Diagnosis

- From where?
- Do what?

Genus: Staphylococci

Treatment: sensitivity

Antibiotics and staphylococci	
Active agents	Agents lacking useful activity
Penicillins ^a	Aztreonam
Cephalosporins	Polymyxins
Aminoglycosides ^b	Mecillinam
Tetracyclines	Nitroimidazoles
Macrolides	Quinolones ^c
Lincosamides	
Glycopeptides	
Fluoroquinolones ^c	
Rifampicin ^b	
Fusidic acid ^b	
Trimethoprim	
Chloramphenicol	
Carbapenems	

^a Resistance common

^b Usually used in combination, e.g. with flucloxacillin.

^c For categorization of quinolones,

Genus: Staphylococci

Treatment: choice

The coagulase negative Staphylococci

- *Staph. epidermidis*
- *>75% of occurrences*
 - Other species:
 - *Staph. haemolyticus*,
 - *Staph. hominis*,
 - *Staph. capitis*
 - *Staph. saprophyticus*.

The emergence of coagulase negative Staphylococci

- Increased use of implants
 -
- Increased incidence of severely debilitated patients in hospitals.

Coagulase negative Staphylococci

Coagulase negative Staphylococci: Pathogenesis

Treatment