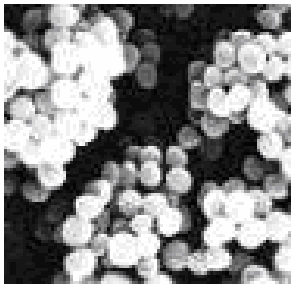
The Staphylococci (*Staphyle* = bunch ; *coccus* = berry or grapes)



- Gram positive

- Spherical
- Microscopic clusters
- Catalase production Facultative anaerobes

- Widely colonize:
  - mucosal surfaces (mouth, nose & throat)
  - and skin

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

Staphylococcus aureus

Main diagnostic features

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

Pathogenesis

- Where and who?

- How?

Taxonomy: Staphylococcus

- Micrococcaceae

Some virulence factors of *Staph. aureus*	
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

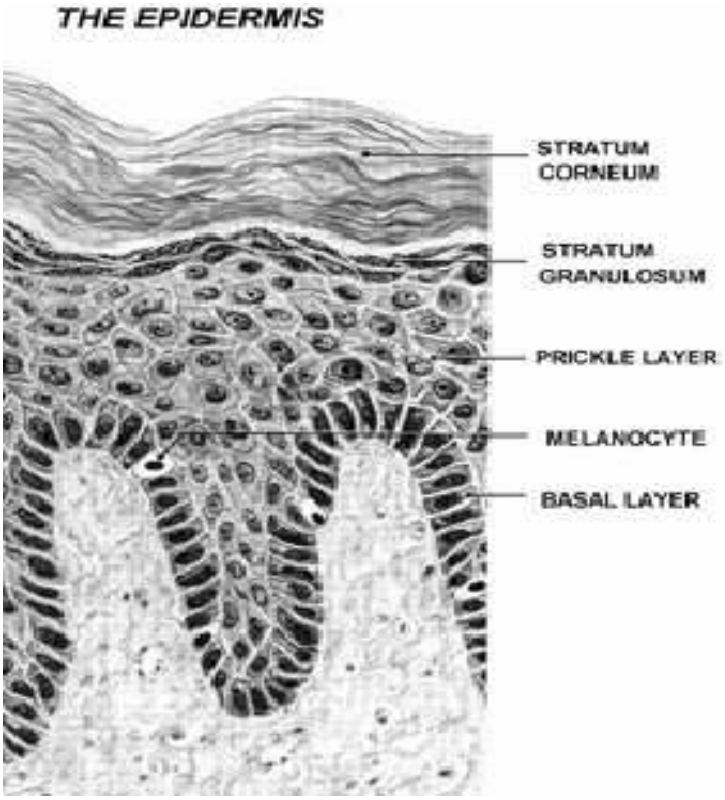
Staphylococcal toxins

- Superantigens
- Epidermolytic toxins A & B

Epidemiology

(Sources of Infection)

- Infected lesions
- Healthy carriers
- Animals



Modes of Infection

Laboratory Diagnosis
• From where?
• Do what?

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.

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: Pathogenesis

Treatment