

Chapter 21  
Diseases of the Skin (pp. 585-591)

The Structure of Human Skin

- Perspiration and sebum contain nutrients
- Salt inhibits microbes
- Lysozyme hydrolyzes peptidoglycan
- Fatty acids inhibit some pathogens

Mucous Membranes

- Line body cavities
- The epithelial cells are attached to an extracellular matrix
- Cells secrete mucus
- Often acidic
- Some cells have cilia
- In eyes, washed by tears with lysozyme

Normal Microbiota of the Skin

- Gram-positive, salt-tolerant bacteria
  - Staphylococci
  - Micrococci
  - Diphtheroids
- Grow on oils
- Aerobes on surface
  - *Corynebacterium xerosis*
- Anaerobes in hair follicles
  - *Propionibacterium acnes*
- Yeast
  - *Malassezia furfur*

Microbial Diseases of the Skin

- Exanthem: Skin rash arising from another focus of the infection
- Enanthem: Mucous membrane rash arising from another focus of the infection

Staphylococcal Skin Infections

- *Staphylococcus epidermidis*
  - Gram-positive cocci, coagulase-negative
- *Staphylococcus aureus*
  - Gram-positive cocci, coagulase-positive

*Staphylococcus aureus*

- Antibiotic resistant
- Leukocidin
- Resists opsonization
- Survives in phagolysosome
- Lysozyme resistant
- Exfoliative toxin
- Superantigen

Staphylococcal Skin Infections

- Folliculitis: Infections of the hair follicles

- Sty: Folliculitis of an eyelash
- Furuncle: Abscess; pus surrounded by inflamed tissue
- Carbuncle: Inflammation of tissue under the skin
- Impetigo: crusting (nonbullous) sores, spread by autoinoculation

Scalded Skin Syndrome

- Toxic shock syndrome (TSS)
  - Toxic shock syndrome toxin 1
- Scalded skin syndrome
  - Bullous impetigo
  - Impetigo of the newborn

Streptococcal Skin Infections

- *Streptococcus pyogenes*
- Group A beta-hemolytic streptococci
- Hemolysins - lyse red blood cells
- Hyaluronidase - dissolves connective tissue component haluronic acid
- Streptolysins - lyse red blood cells, toxic to neutrophils
- M proteins - from cell wall, binds to neutrophils to activate them; helps bacterium attach and resist phagocytosis

Streptococcal Skin Infections

- Meningitis
- Pneumonia
- Sore throat
- Otitis media
- Endocarditis
- Puerperal fever
- Dental caries
- Necrotizing fasciitis
- Erysipelas

Invasive Group A Streptococcal Infections

- Exotoxin A, superantigen

Streptococcal Toxic Shock Syndrome

- M proteins
- Complex with fibrinogen
- Binds to neutrophils
- Activates neutrophils
- Release of damaging enzymes
- Shock and organ damage