Microbiology (Bio 206) #24: Bacterial Diseases of the Respiratory System

Terms you should know:

- respiratory system
- pharynx
- hemolytic/hemolysis
- blood agar
- pyrogenic toxin
- hyaluronidase
- erythrogenic toxin
- septicemia
- scarlet fever
- rheumatic fever
- pharyngitis
- pneumonia
- diphtheria
- lysogeny
- pertussis

**Streptococcus pyogenes**

Description: Gram-positive coccici in chains

Diseases: “Strep throat,” scarlet fever, rheumatic fever, toxic shock

Virulence factors: Hemolytic exotoxin (β-hemolysis), pyrogenic exotoxin, hyaluronidase

Scarlet fever strains also produce and erythrogenic toxin

Treatment: Antibiotics (all strains so far susceptible to penicillin G)

Reservoir and spread: Human reservoir only; spread by respiratory route

**Streptococcus pneumoniae**

Description: Gram-positive coccici in chains

Diseases: Pneumonia (“pneumococcal pneumonia”)

Virulence factors: Capsule (dramatically reduces phagocytosis)

Disease symptoms mostly due to inflammatory response

Treatment: Antibiotics (40% resistant to penicillin)

Reservoir and spread: Human reservoir only; spread by respiratory route

**Corynebacterium diphtheriae**

Description: Gram-positive rods (often irregular in shape)

Diseases: Diphtheria

Virulence factors: Diphtheria toxin produces all symptoms of disease: inhibits protein synthesis; genes carried by lysogenic bacteriophage

Treatment: Antibiotics, but not effective against toxin

Prevention by vaccination

Reservoir and spread: Human reservoir only; spread by respiratory route

**Bordetella pertussis**

Description: Short, gram-negative rods

Diseases: Pertussis (“whooping cough”)

Treatment: Prevention by vaccination (antibiotics ineffective by the time diagnosed)