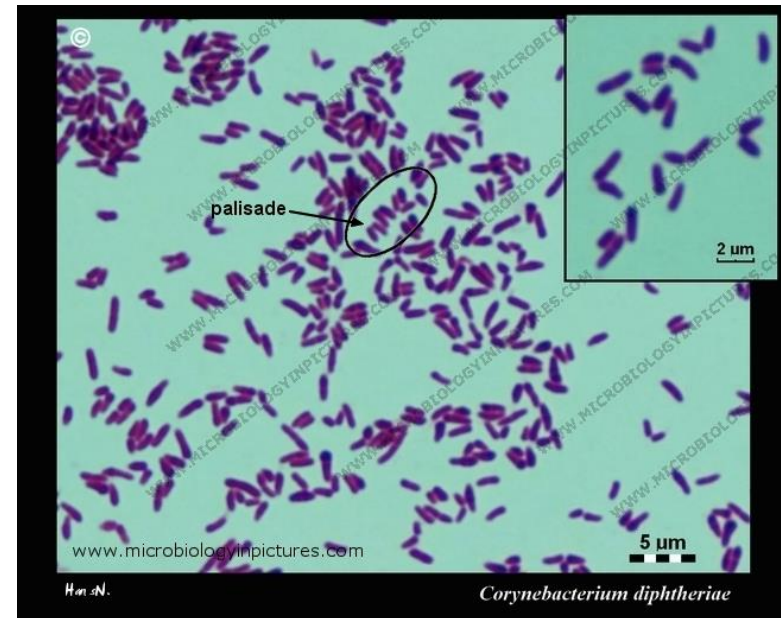


Medical Bacteriology- Lecture 9

Non Spore- forming Gram positive Bacilli *Corynebacterium*



Corynebacterium

- **Characteristics:**
- Gram-positive, rod-shaped bacteria
- Aerobic
- Clusters irregular resembling Chinese letters.
- Possess metachromatic granules
- Cell wall containing unusual lipids
- Fastidious
- (Diphtheroids); colonize skin, respiratory tract.
-
- Medically important species;
- *Corynebacterium diphtheria*, causes diphtheria.

C. diphtheria

Diphtheria

Diphtheria is an upper respiratory tract disease.

- **Acute, localized and systemic infection**
- **toxin mediated disease caused by toxigenic *C. diphtheria***
- **Toxin (major virulence factor)**
- **play role in colonization process in addition to pilli**
- **Responsible for systemic effects**
- **Characterized initially** by (sore throat, low fever, **pseudomembrane** on tonsils, pharynx, and nasal cavity).
- **Later stages** (localized damage, bleeding, difficulty in breathing, peripheral neuritis).
- **Very contagious**

Mode of action of Diphtheria Toxin

- After binding to host cell, active subunit of toxin prevent protein synthesis (elongation factor), result in cell death
- (elongation factor) EF-2 + NAD $\xrightarrow{\text{Protein A}}$ ADP-Ribose-EF-2 +Nicotinamide

Cutaneous diphtheria (jungle sore)

- A mild form of diphtheria
- skin.
- Chronic non-healing ulcer results
- Occurs in the tropics
- rarely fatal.

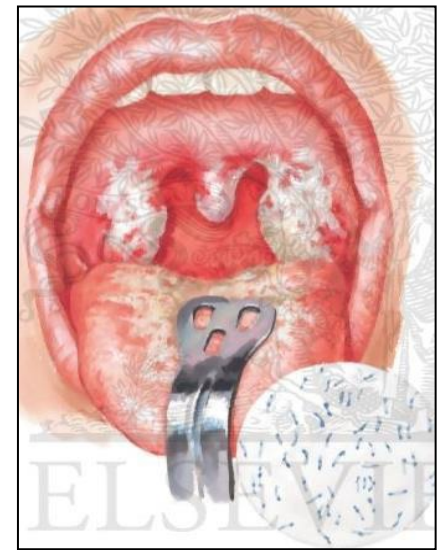
Diphtheria

- *C. diphtheria* required two factors to produce diphtheria toxin and cause infection:

Presence of lysogenic phage in bacterial chromosome under conditions of iron deficiency

- Diphtheria toxin gene; encoded by phages
- Activated by iron
- High iron levels = no toxin release
- Low iron levels= toxin released

C. diphtheria diagnosis

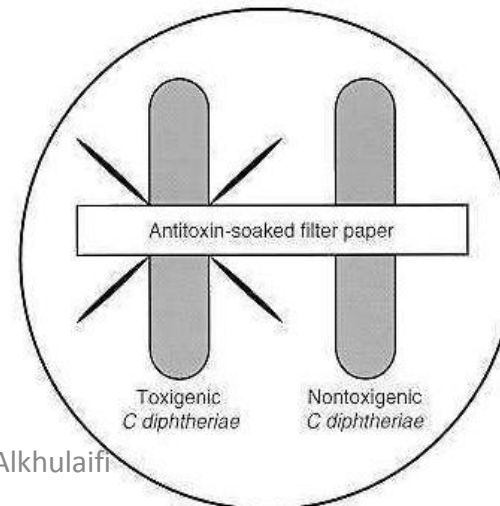
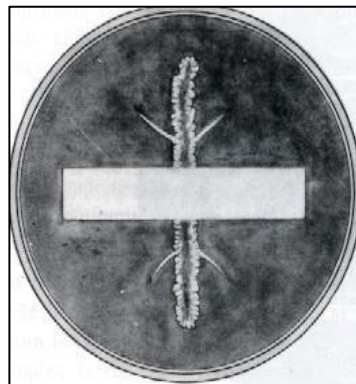


- **Pseudomembrane**
- **Selective media:** Loefflers serum medium
- **Blood tellurite agar**

- **Toxin Production testing:**
- **1- Guinea pig-inoculation**

Strain	Unprotected animal	protected animal (Antitoxin)
Toxigenic	Death	Survival
Non- toxigenic	Survival	Survival

- **2- Elek test**



Treatment & Prevention

- **Treatment**
 - Penicillin and erythromycin
- **Acquired immunity**
 - antitoxin to neutralize toxin
 -
- **Passive immunity**
 - trans placenta
- **DPT vaccine: Diphtheria toxoid, Pertussis vaccine & Tetanus toxoid**