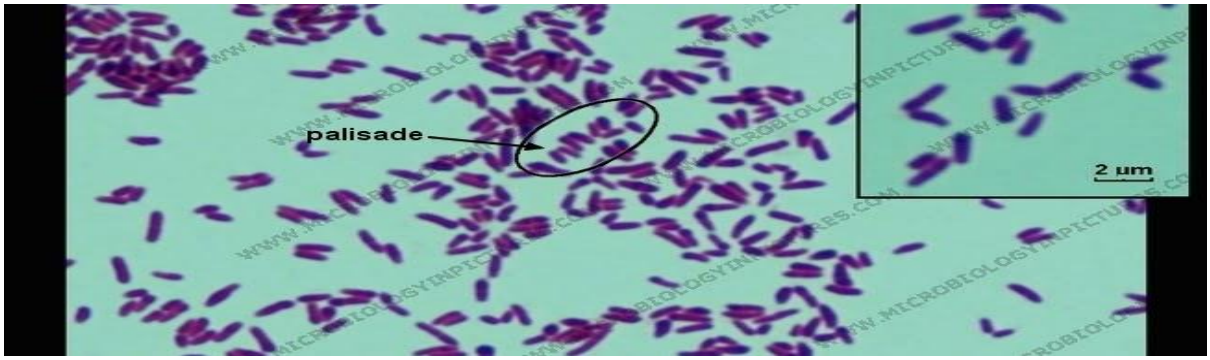
Corynebacterium ; *propionibacterium acnes*

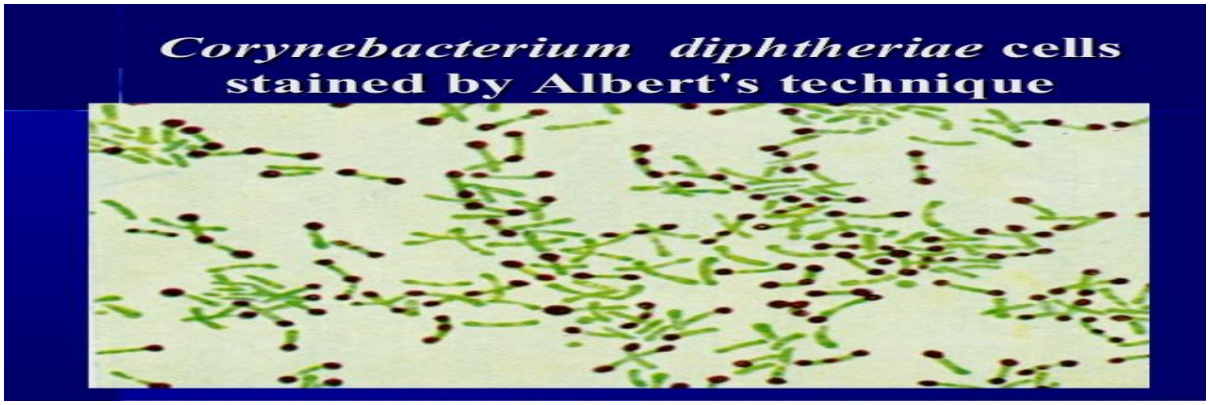
Corynebacterium*:** Habitat Skin ,upper respiratory tract, GI tract and Urogenital tract of humans. Example for these bacteria : ***C. diphtheria, C.pseudotuberculosis ***,C.jeikeium*** **and** ***C.ulcerans.***The four species differ slightly in their colonial morphology and biochemical properties

1-Microscopic appearance for *C. diphtheria*

- **Gram stain :** *Corynebacterium* is a Gram-positive, rod-shaped bacteria (pleomorphic) , frequently shows club shaped swelling and hence the name Coryne meaning club ("Chinese letters") . They are non sporing , non capsulated and non motile. The granules are composed of polymetaphosphate granules.



- **Albert stain** – green colour bacilli are seen with black colour granules.



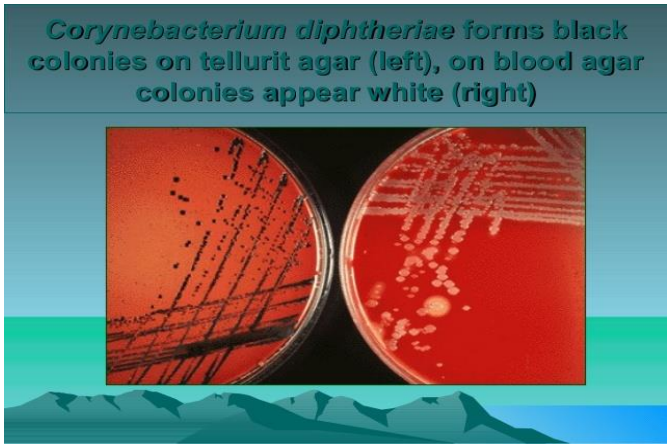
2- Primary Isolation Media

The optimum temperature for growth is 37°C (range 15 – 40 °C) and the optimum pH is 7.2. It is an aerobic and a facultative anaerobic. The usual media employed for the cultivation of the diphtheria bacillus are:

A. **Blood agar** (Enrichment): - skin swabs incubated in 5-10% CO2 at 35-37°C for 40-48hr and throat swabs incubated anaerobically at 35-37°C for 16-24hr.

B. **Hoyle's tellurite agar:** incubated in air at 35-37°C for 16-48hr. black colonies not diagnostically significant , tellurite inhibits many organisms but not *C. diphtheriae*

C. **Loeffler's serum and tellurite blood agar**: Diphtheria bacilli grow on Loeffler's serum slope very rapidly and clolonies can be seen in 6-8 hours, long before other bacteria grow. Colonies are at first small, circular white opaque discs but enlarge on continued incubation and may acquire a distinct yellow color .



D. Hiss's serum water for testing sugar fermentation:

Diphtheria bacilli ferment with the production of acid, (but not gas) glucose, galactose, maltose and dextrin (but not lactose, mannitol or sucrose). Some strains of virulent diphtheria bacilli have been found to ferment sucrose.

3-Test Procedures (Biochemical tests):

Rapid (4hr) tests should be performed for urease, pyrazinamidase, catalase and nitrate reduction.

- **Catalase test**

All potentially toxigenic corynebacteria are catalase positive and for non-toxigenic *Corynebacterium* species, the catalase test results are varied.

- **Pyrazinamidase test**

All potentially toxigenic corynebacteria (*C. diphtheriae*, *C. ulcerans* and *C. pseudotuberculosis*) are pyrazinamidase negative while other corynebacteria are positive.

- **Urease test**

The urease test is used to determine the ability of an organism to split urea, through the production of the enzyme urease. *C. ulcerans* and *C. pseudotuberculosis* are urease positive.

- **Nitrate Reduction test -** see table below

Antibiotics: Diphtheria is also treated with antibiotics, such as penicillin or erythromycin. Antibiotics help kill bacteria in the body, clearing up infections. Antibiotics reduce to just a few days the length of time that a person with diphtheria is contagious.

Propionibacterium acnes

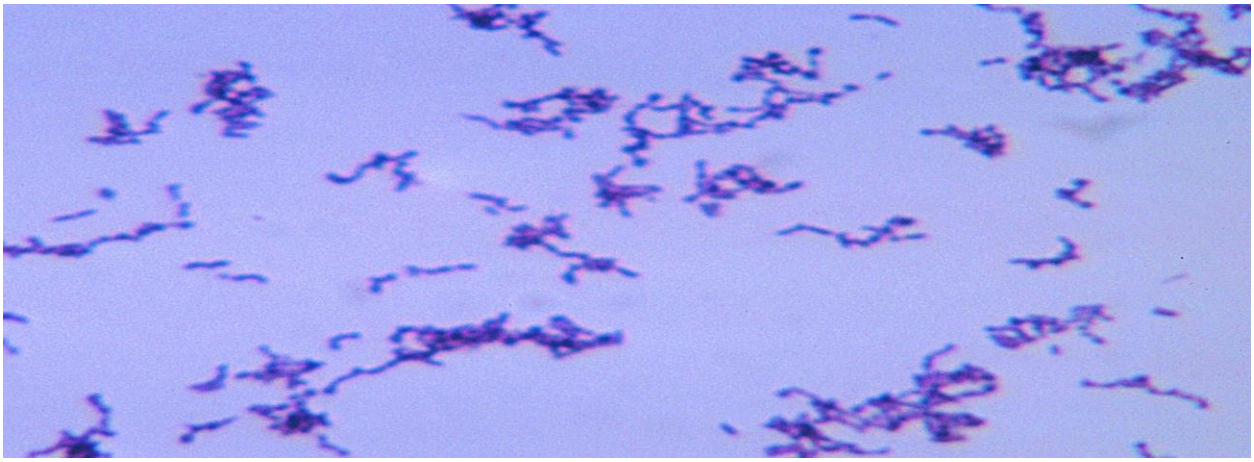
The relatively slow-growing, typically aerotolerant anaerobic, Gram-positive bacterium (rod) linked to the skin condition of acne; it can also cause chronic blepharitis and endophthalmitis, the latter particularly following intraocular surgery. P. acnes can also colonize the nose, where it can then be responsible for local spread of acne to the face and back through contact, such as from touching the nose and then touching the face or back. However, acne is not known to spread from person to person and is not considered contagious.

Pathogenicity

Found as secondary agents of infected sinuses, wounds, and abscesses in humans and other animals. Specifically, the "acnes group" is associated with human skin and intestinal infections, while the "dairy group" is associated with cheese and dairy products. Various *Propionibacterium* spp., particularly *P . acnes* , have been implicated in infections of corneal ulcers, heart valves and prosthetic devices (e.g. artificial joints), and ventricular shunts. These infections often lead to steomyelitis, bacteremia, endocarditis, and meningitis.

Microscopic appearance

Gram Stain:	Gram-positive.
Morphology:	Pleomorphic, branched and unbranched rods, coccoid forms, or bifid, but they are not filamentous. Cells are often "club-shaped" with one end rounded and the other tapered. Cells occur in singly, in pairs or short chains, in "V" or "Y" configurations, or in clumps with a "Chinese character" arrangement.
Size:	0.5-0.8 micrometers by 1.0-5.0 micrometers.
Motility:	Non-motile.
Capsules:	None.
Spores:	None.



Recommended media

For culture:	Tryptone Yeast Extract, Glucose Medium with 0.5% Tween ® 80.
For selective isolation:	Yeast Extract, Sodium Lactate Medium (dairy).
For maintenance:	Cooked Meat Medium for short-term maintenance and Lyophilization for long-term storage.

- **There are many things a person can do to prevent pimples and other forms of acne, including:**

Wash the face twice daily. ...

Refrain from harsh scrubbing. ...

Keep hair clean. ...

Refrain from popping or picking at pimples. ...

Apply topical treatments. ...

Treatment

In order to eradicate the infections, device removal is recommended. P. acnes is usually susceptible to a wide range of common antibiotics, although some, particularly in acne patients, have been found to be resistant to clindamycin, erythromycin and tetracyclines.

The best antibiotics used

Usually the first choice for treating acne is tetracycline — such as minocycline or doxycycline — or a macrolide. Oral antibiotics should be used for the shortest time possible to prevent antibiotic resistance. Oral antibiotics are best used with topical retinoid and benzoyl peroxide.

Dose of treatment

Oral antibiotics can take about six to eight weeks to start working, so you won't see results right away. Even if you aren't seeing any improvement, it's important to keep taking minocycline as directed by your doctor. Sometimes, bacteria become resistant to antibiotics over time.