

NEISSERIA

The background features a dark blue gradient that transitions to a lighter blue at the bottom. A thin, light blue curved line starts from the left edge and sweeps across the upper portion of the frame, creating a sense of motion or a stylized horizon.

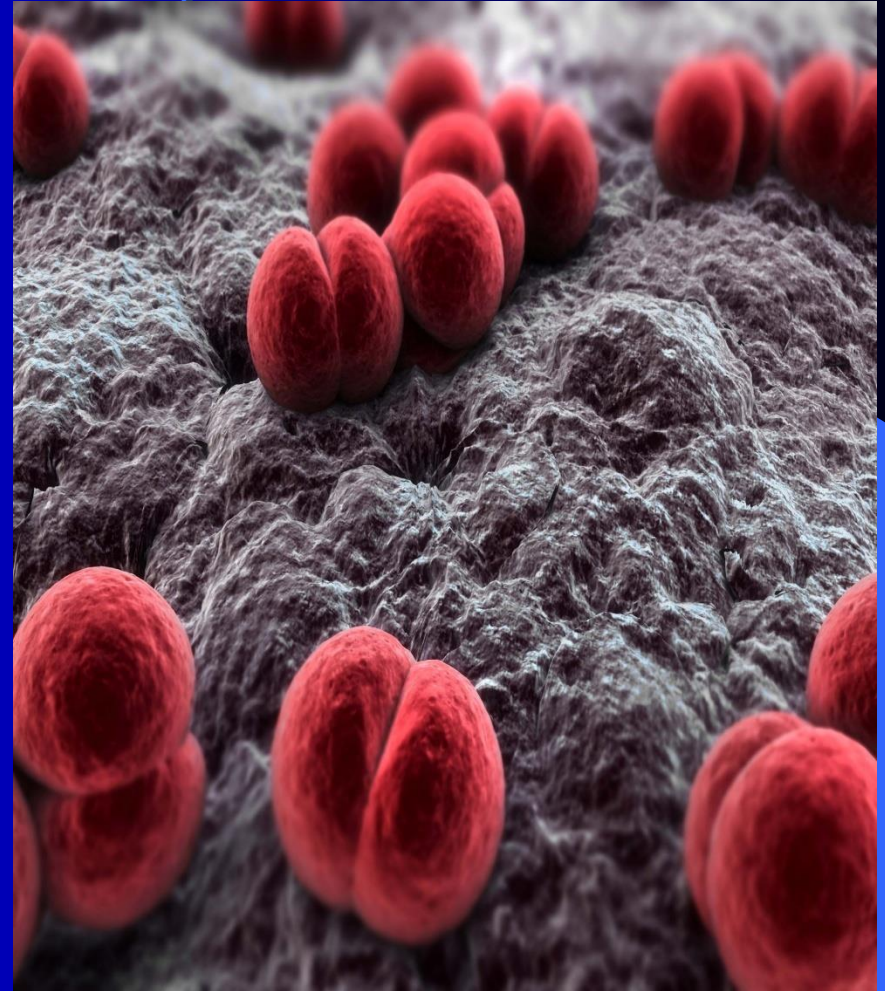
NEISSERIA

Introduction

➤ Pathogens are:-

N.meningitidis

N.gonorrhoeae



Selective media

1. Thayer-Martin medium contains vancomycin, colistin, nystatin.

Vancomycin

kills all Gram Positive organisms

Colistin (polymyxin)

kills all Gram Negative organisms
(except Neisseria)

Nystatin

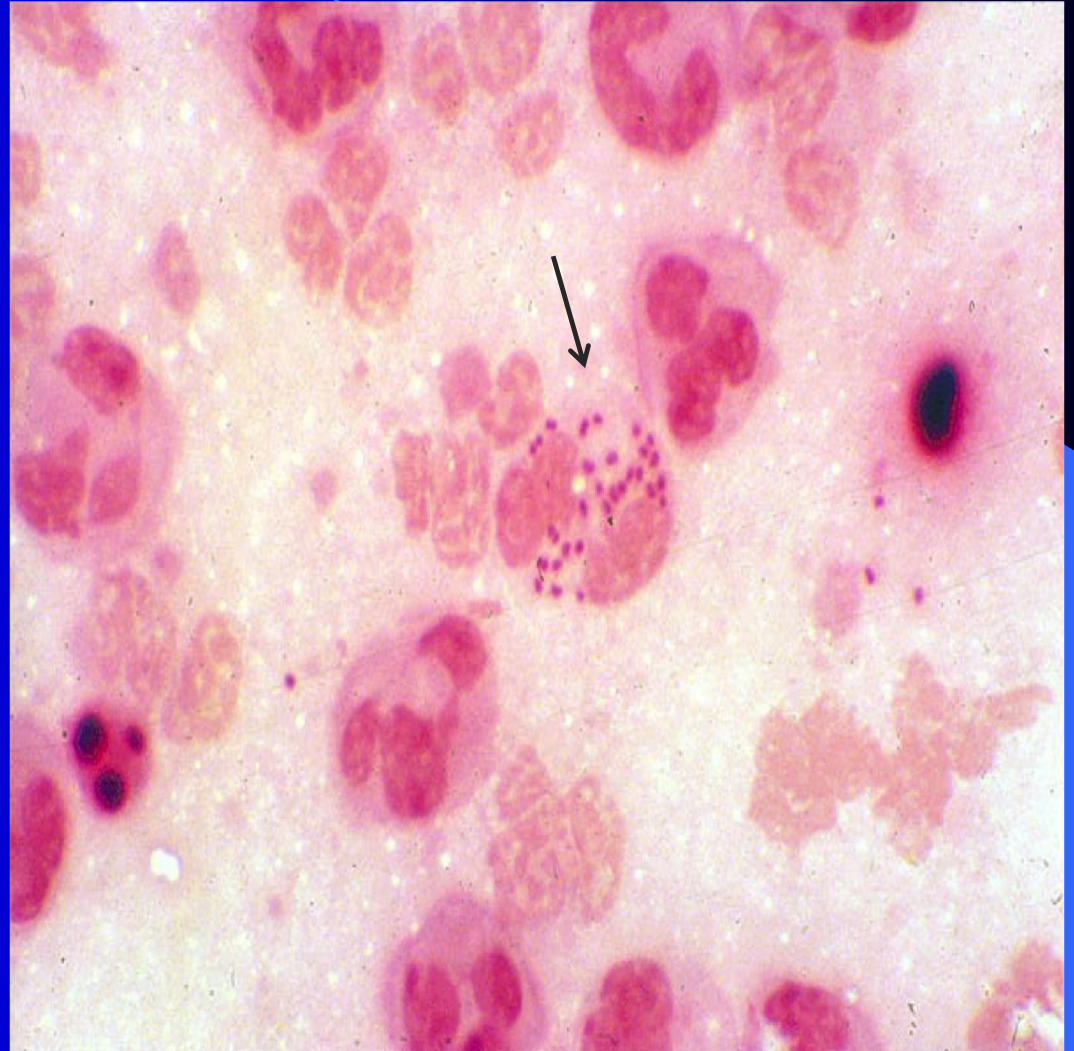
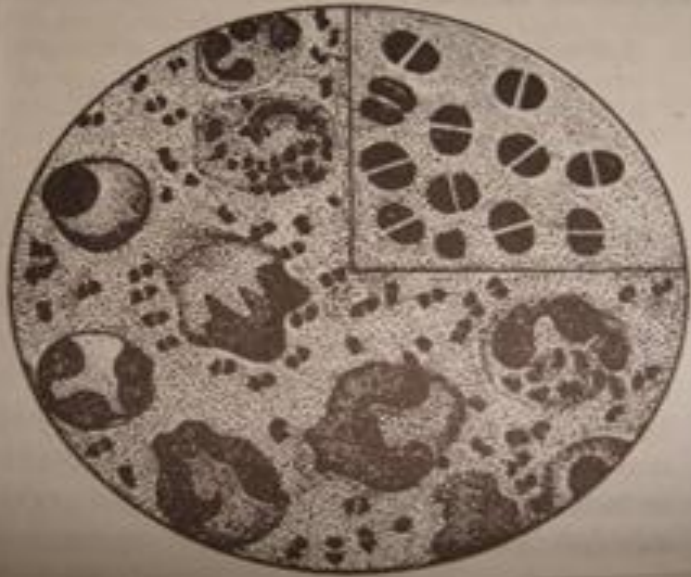
kills all Fungi

2. Modified New York City medium (MNYC)

N. meningitidis

Morphology :

Arranged in pair with
adjacent surfaces
flattened



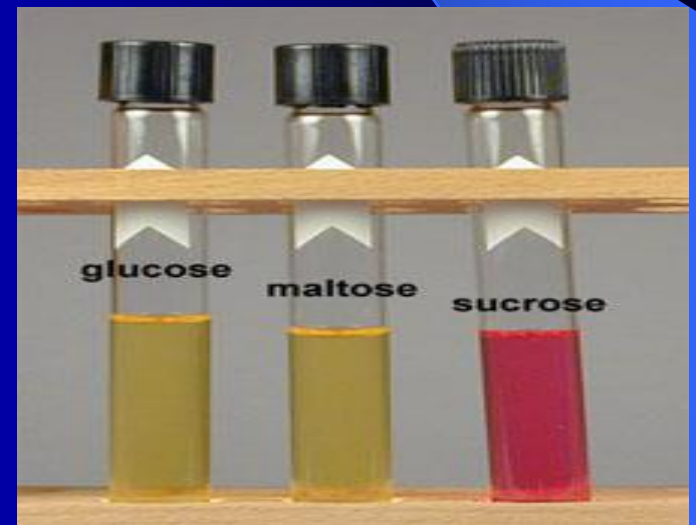
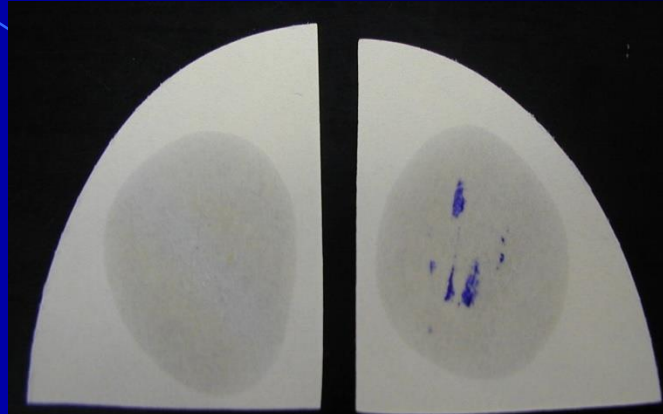
Cultural characteristics

- ❑ Strict aerobe, required 5-10% **CO₂** 35-36°C.
- ❑ chocolate agar/ Muller Hinton agar/ Modified Thayer Martin medium



Biochemical reactions

- ❖ Oxidase test: Positive
- ❖ Catalase test: Positive
- ❖ Glucose fermentation: Acid only
- ❖ Maltose fermentation: Acid only



Pathogenicity

❖ **Cerebrospinal meningitis**

❖ **Meningococcal septicemia**

Laboratory diagnosis

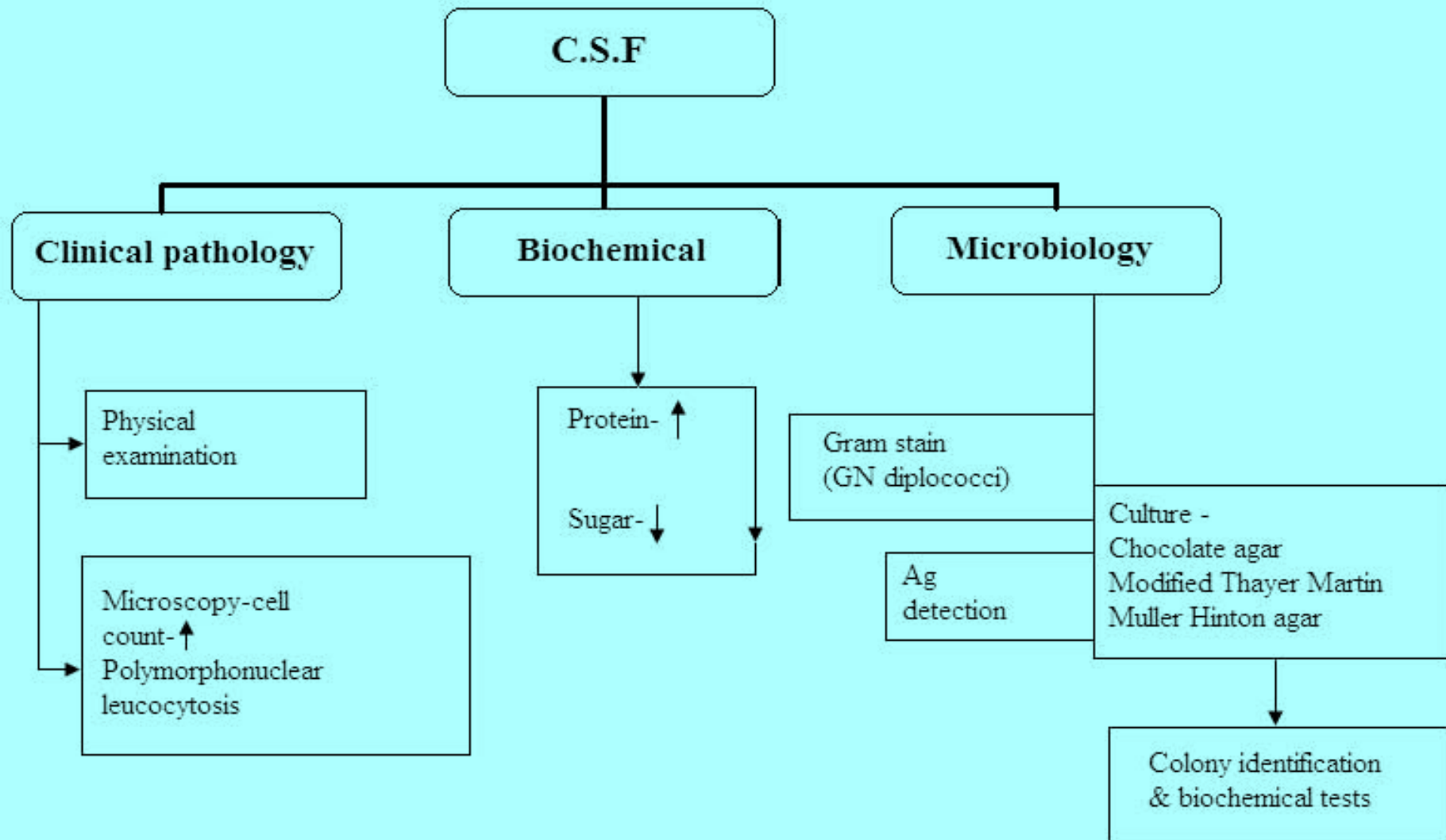
Sample collection

- C.S.F.
- Blood for culture
- Nasopharyngeal swab (West's post nasal swab)

Sample processing

- **CSE**:
- Gram stain
- Culture deposit into chocolate agar, Modified Thayer Martin agar & Muller Hinton agar.
- Incubate in 5-10% CO_2 at 35-36°C.
- Id : cultural characteristic and biochemical reactions.
- **Capsular antigen detection**: From the CSF by passive agglutination test.

In case of meningitis CSF of the patient is divided in three parts and processed as follow



N. gonorrhoeae

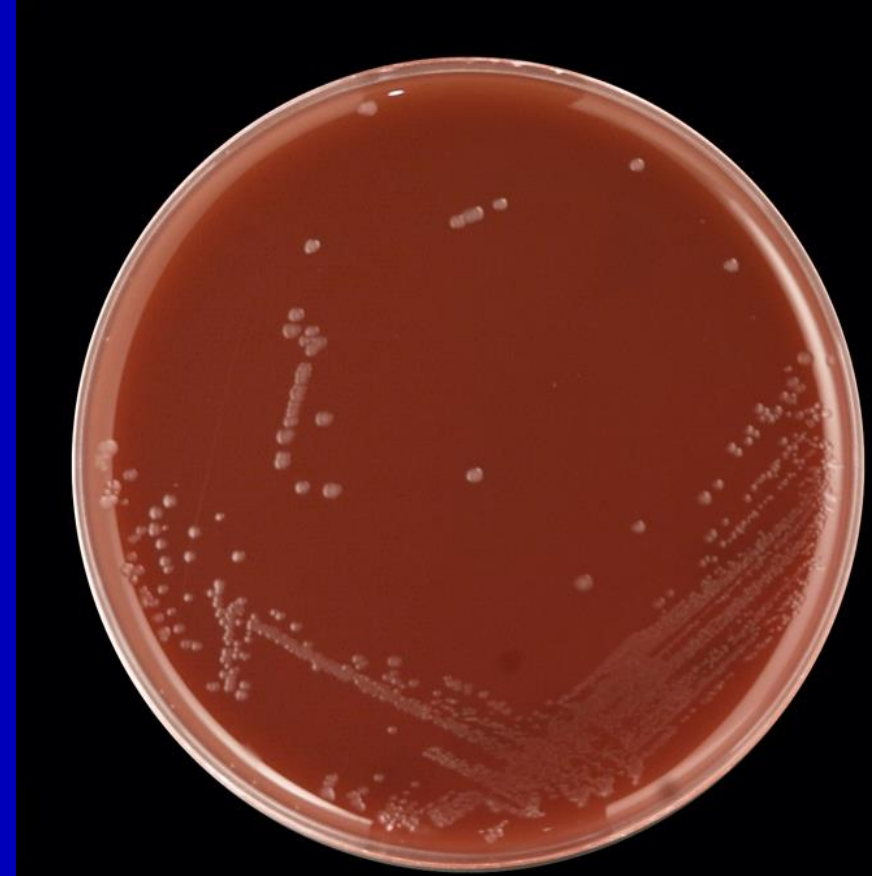
Morphology

- Gram negative, kidney shaped cocci
- Arranged in pair with adjacent surfaces **concave**



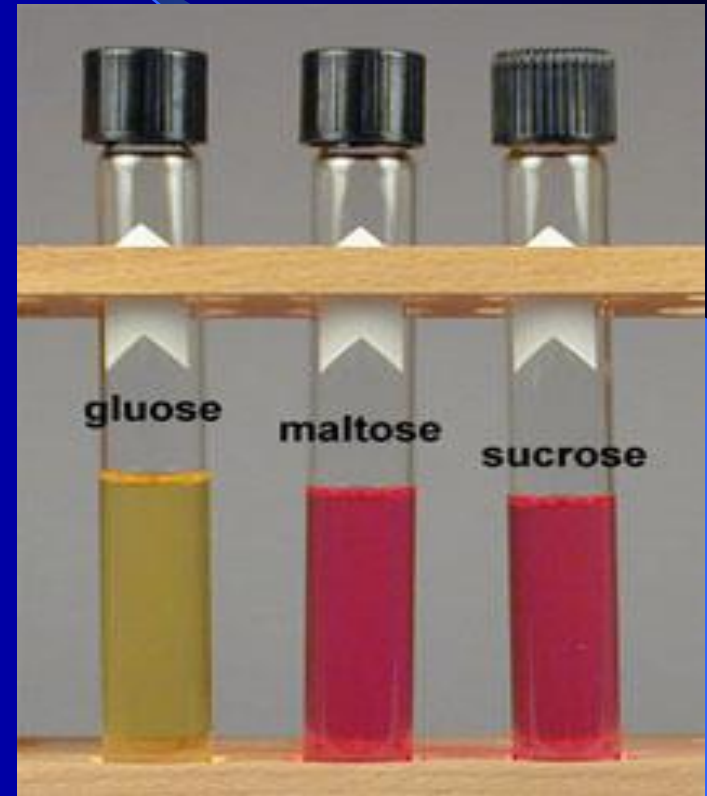
Cultural characteristics

- ❖ More difficult to grow than meningococci
- ❖ Colony characteristics



Biochemical reactions

- ❑ Oxidase Positive
- ❑ Catalase test Positive
- ❑ Glucose Acid only
- ❑ Maltose Not fermented



Pathogenicity

- ❖ Gonorrhoea
- ❖ Vulvovaginitis in prepubertal girls
- ❖ Proctitis
- ❖ Ophthalmia neonatorum

Laboratory diagnosis

Sample collection

In male

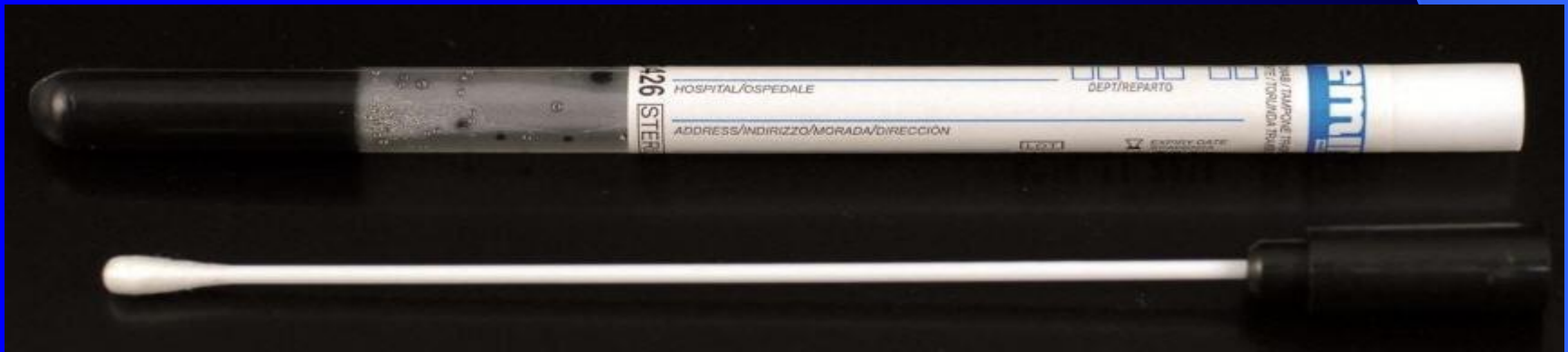
- ❖ Purulent urethral discharge (morning drop of secretion or obtained by prostatic massage), Urine

In females

- ❖ Endo cervical swab Urethral swab Rectal swab

Transportation

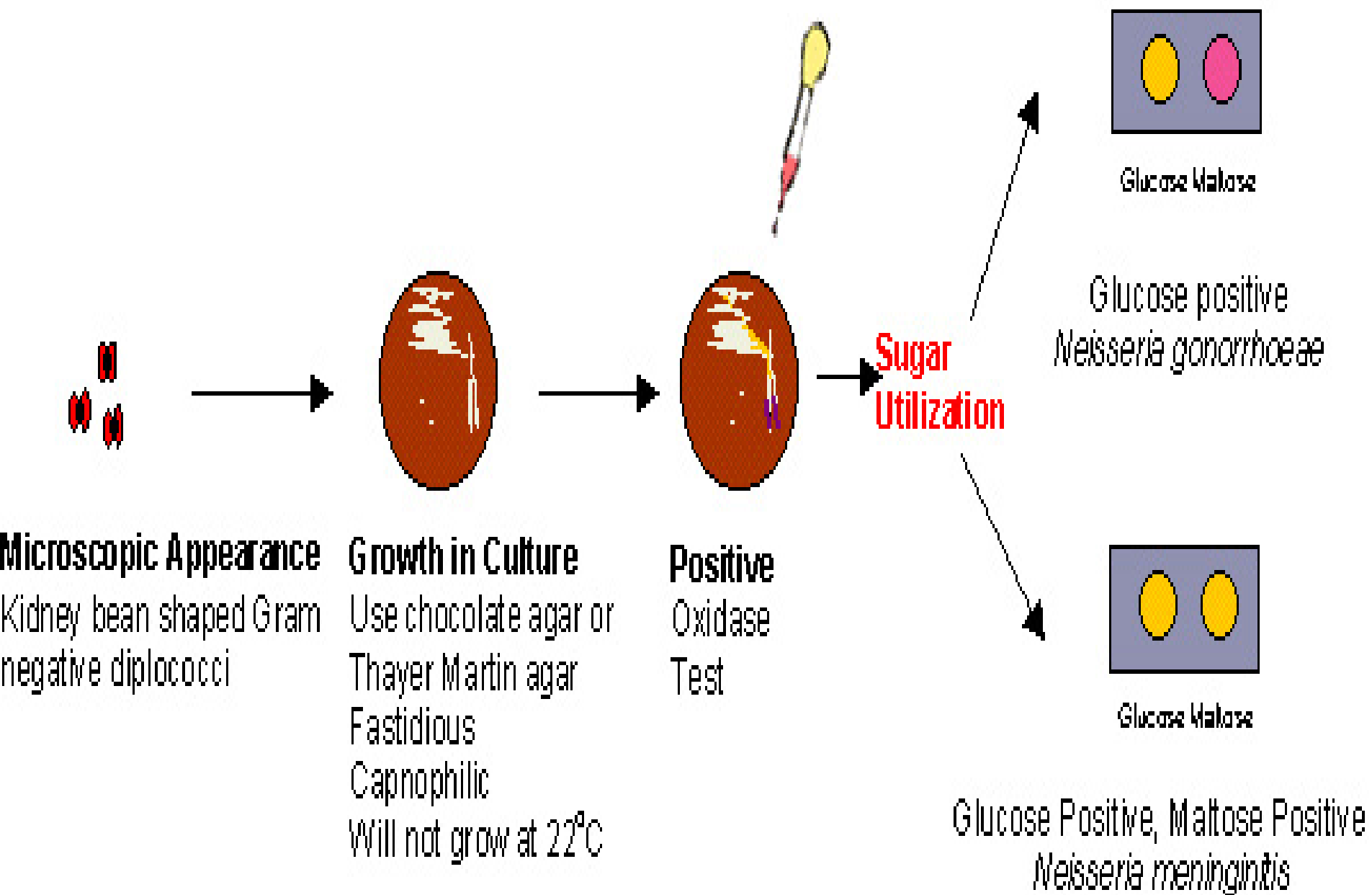
- Transport media:
Transgrow or
JEMBEC
- Immediately / if delay
Swab transported in
amies transport
medium



Sample processing

- Specimen: urethral, cervical smears & swabs (transport medium).
- Gram film: intracellular Gram -ve diplococci
- Culture: selective media
- Oxidase +ve
- acid production from glucose
- Latex agglutination

Neisseria gonorrhoeae and *Neisseria meningitidis* Flow Chart



Questions

- Enumerate bacteria causing purulent meningitis.

Three primary pathogens:

N. meningitidis, H. Influenza, S. pneumoniae

N. meningitidis - all ages

H. Influenza - 2m-5y

S. pneumoniae - all ages but more common in adult with underlying illnesses.

E. coli & other coliforms

Strept. group B

Flavobacteria

After surgery or trauma

S. aureus

S. pneumoniae

Listeria

Salmonella spp.

All common in **neonates**



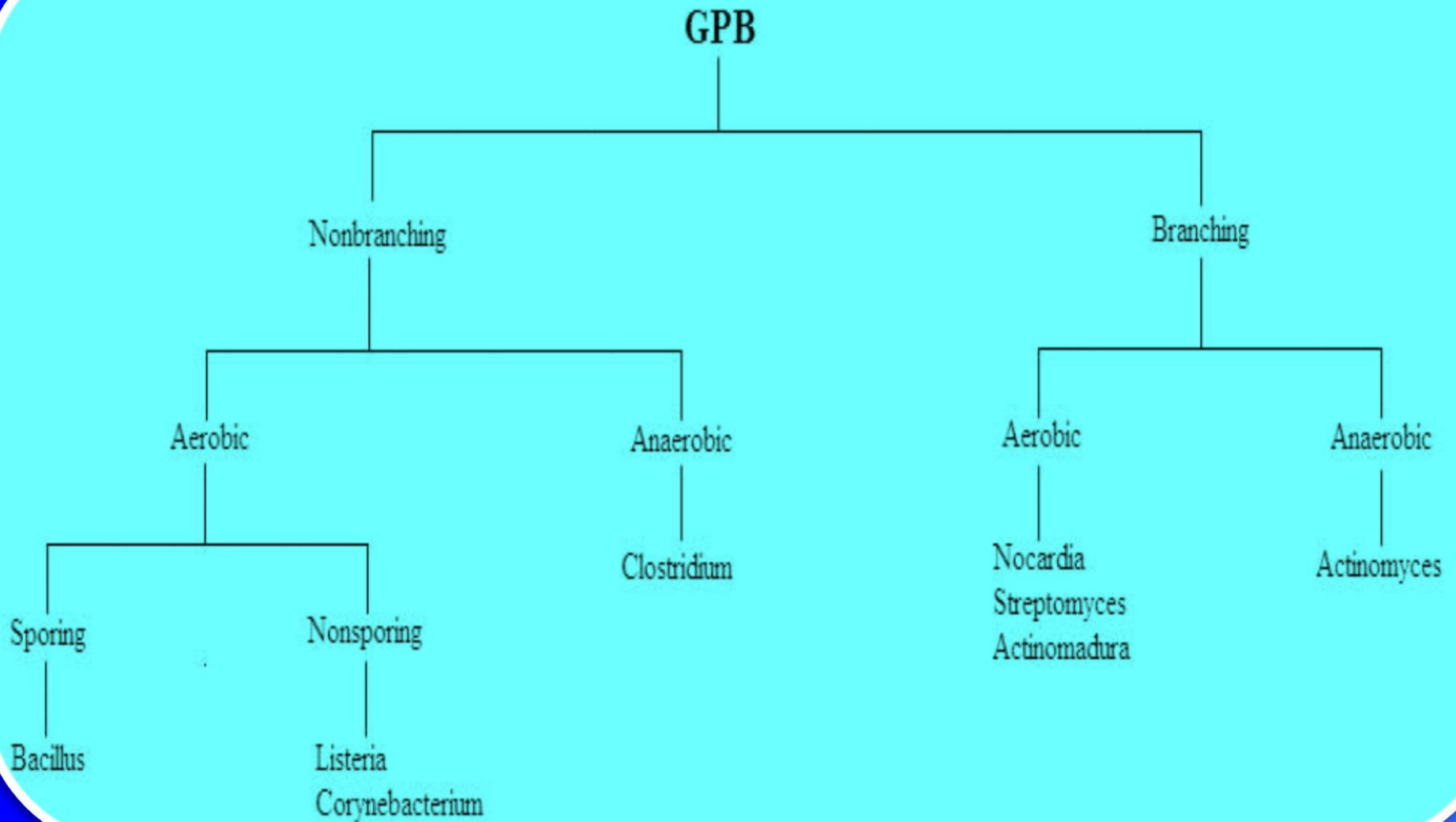
- How meningococci reach to the meninges?
 - Meningococcal meningitis, as a spread from nasopharynx **blood stream** meninges in susceptible hosts.
 - **Direct spread** to meninges
- Enumerate the media used for isolation of meningococci and gonococci.
- Which antimicrobial agents are added in modified Thayer-Martin medium? Why?
- Write full form of MNYC medium.

PRACTICAL 17A

GRAM POSITIVE

BACILLI

Classification of Gram Positive Bacilli (GPB)



CORYNEBACTERIUM

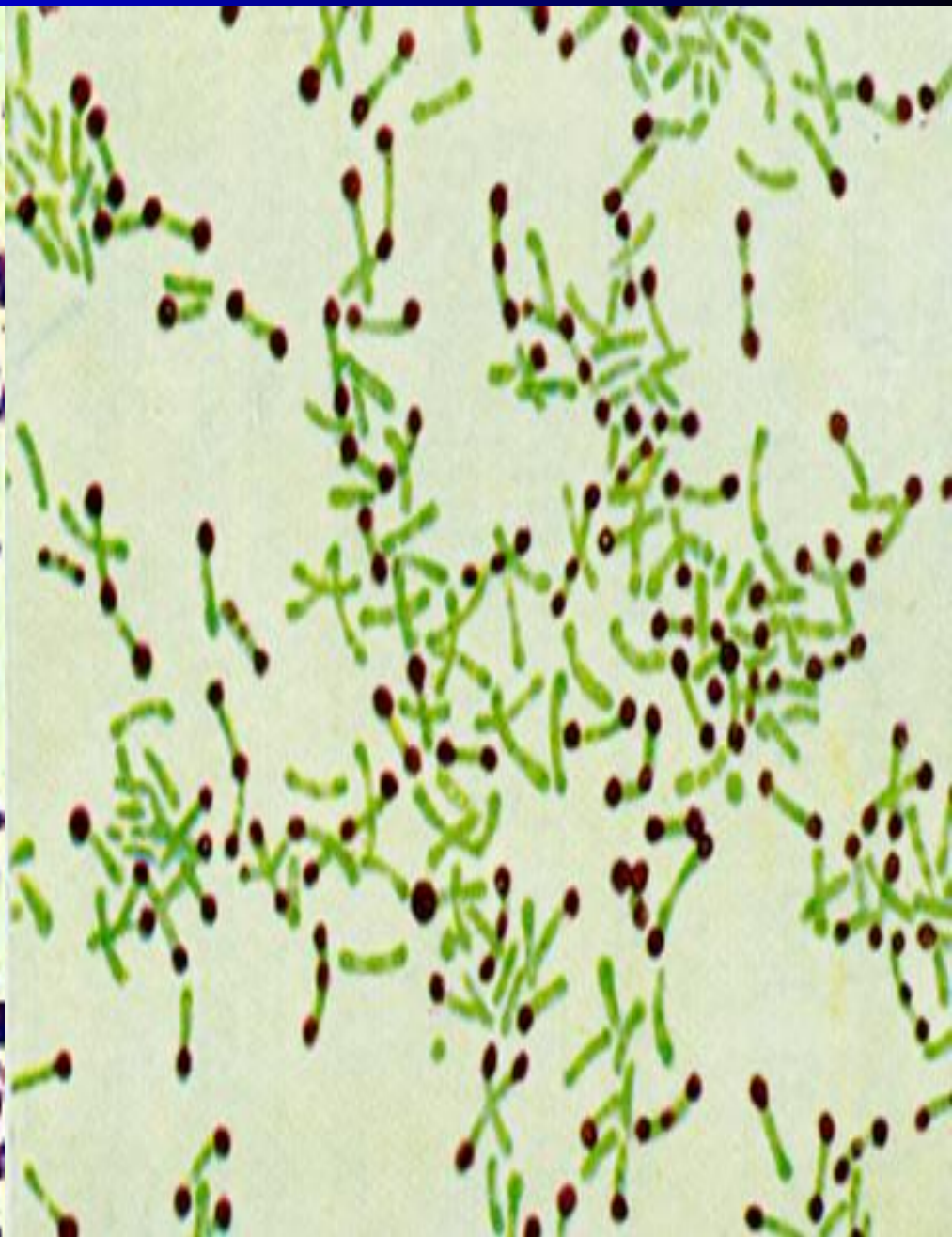
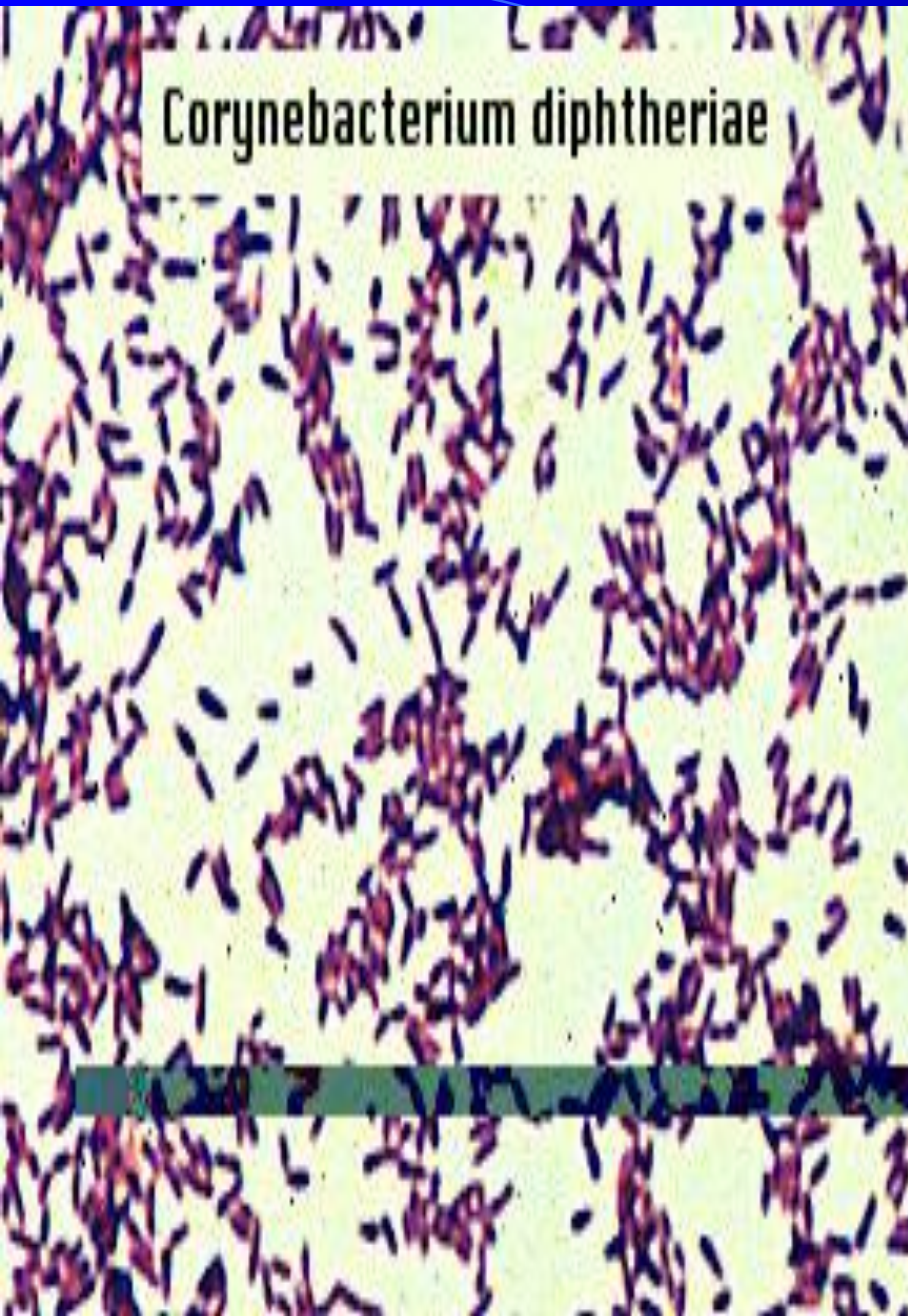
- **Genus:** Corynebacterium

- **Species:** C. diphtheriae ,C. ulcerans, C. pseudotuberculosis, C.xenopi

Morphology

- Cuneiform (Chinese letter pattern) arrangement
- volutin granules or metachromatic granules.
- On Albert staining: Bacilli - green colour & Granules - blue colour

Corynebacterium diphtheriae



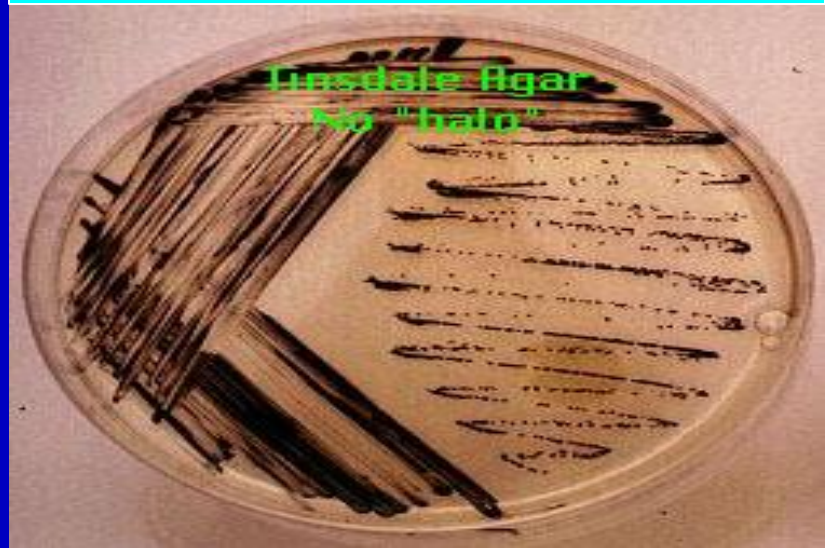
Cultural characteristics

- Loffler's serum medium
- Tellurite blood agar
- Modified Tinsdale's medium



Loeffler's Serum
slope

Modified Tinsdale's agar



Tellurite agar



Biochemical reactions

C. diphtheria ferments glucose & maltose with production of acid.

Urease test - Negative.

Virulence test:

(i) In vivo test:

(a) Subcutaneous test - Animal = Guinea pig

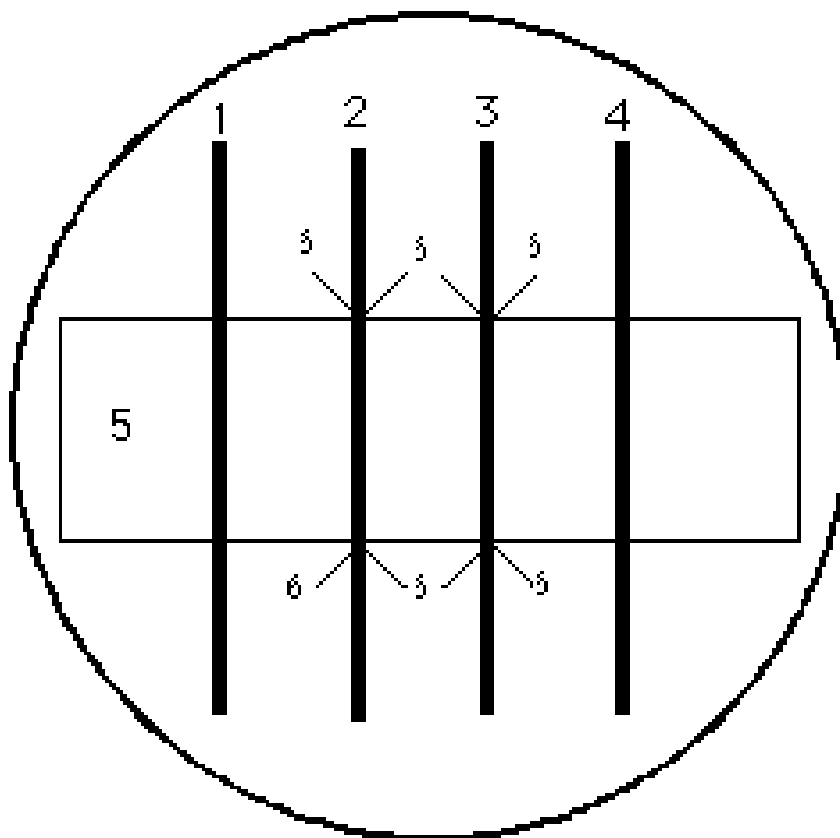
(b) Intracutaneous test - Animal = Guinea pig

(ii) In vitro test:

(a) Elek's gel precipitation test

(b) Tissue culture test

Elek's gel precipitation



1 = *C. diphtheriae*- (non-toxigenic)
negative control

2 = *C. diphtheriae*- test organism

3 = *C. diphtheriae*- (toxigenic)
positive control

4 = *C. diphtheriae*- test organism

5 = ANTITOXIN STRIP

6 = lines of precipitate

Laboratory diagnosis

- Throat or nasopharyngeal swabs
- Direct staining
- Culture on selective media
- confirmation done on the basis of colony morphology, biochemical reaction and by in vitro virulence test.

Questions

1. Why diphtheria bacillus is known as KLB?
2. Difference between *C. diphtheriae* and diphtheroid.
3. Enumerate types of diphtheria.
4. What is responsible for toxigenicity of *C. diphtheriae*?

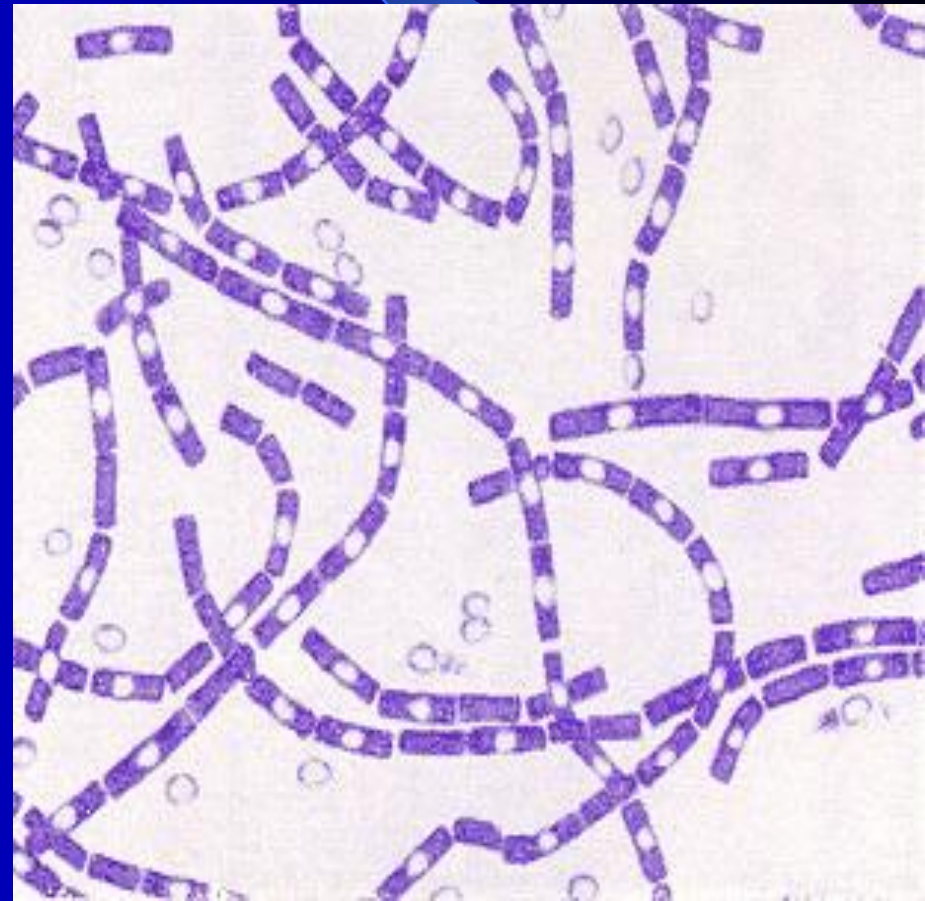


Practical 17B

Bacillus

GENUS: Bacillus

MORPHOLOGY



Species:

- ❖ *B. anthracis* - cause Anthrax disease.

Specimens must be marked **HIGH RISK**.

Smears are stained by Gram's stain and polychrome methylene blue stain. (McFadyean's reactions).

- ❖ *B. subtilis* - cause contamination in the laboratory.
- ❖ *B. cereus* — cause food poisoning.
- ❖ Spores of *Bacillus sterothermophilus* are used to validate autoclave process

- M'Fadyean's reaction
- Medusa Head appearance
- Inverted fir tree appearance
- String of pearls reaction
- PLET(polymixin, lysozyme, EDTA, thallos acetate) added to heart infusion agar.

Questions

Enumerate modes of transmission of Anthrax.



