معمل التركيب الدقيق

للكائنات الحية

" 222 MIC "
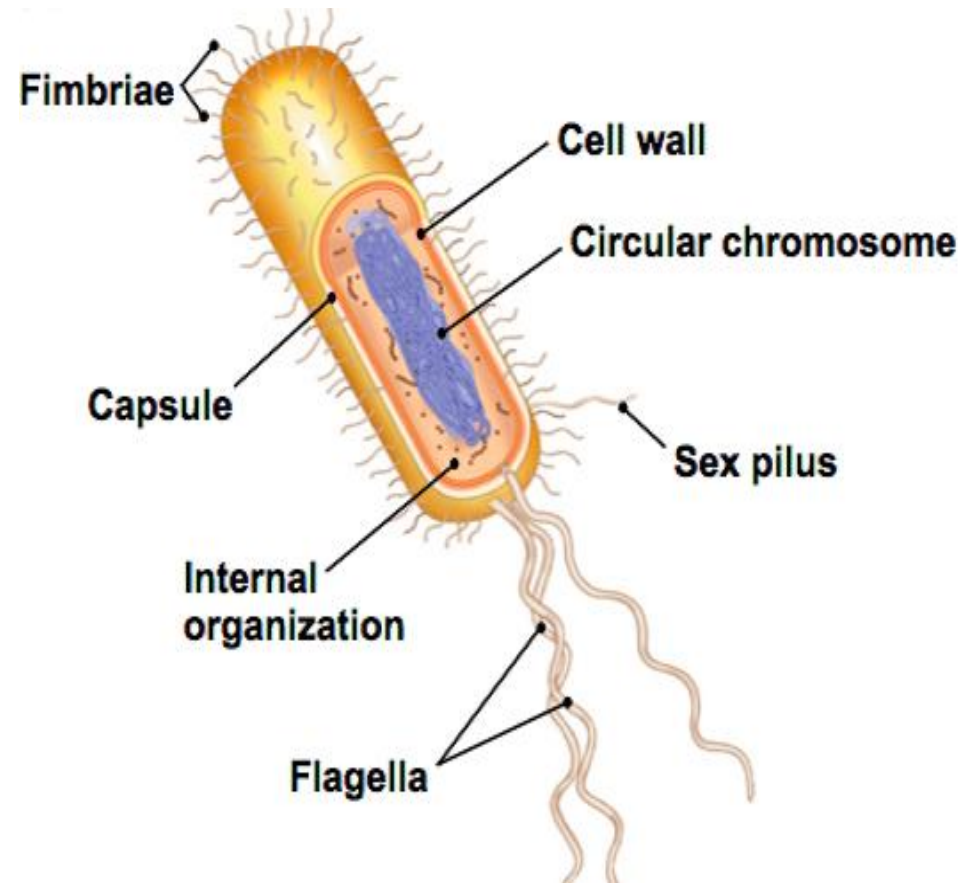
المعمل الثالث
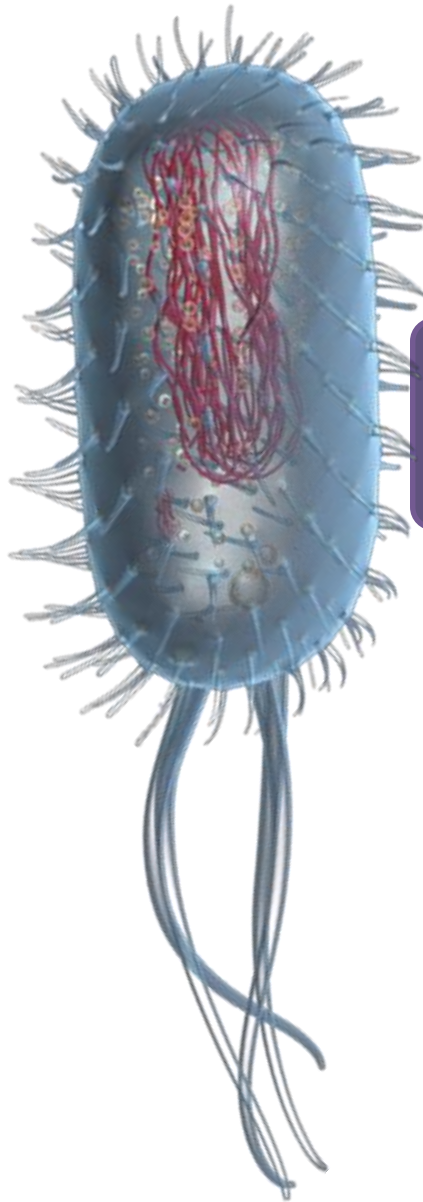
نورة الكـبيسي

Nalkubaisi@ksu.edu.sa

2021

BACTERIAL APPENDAGES
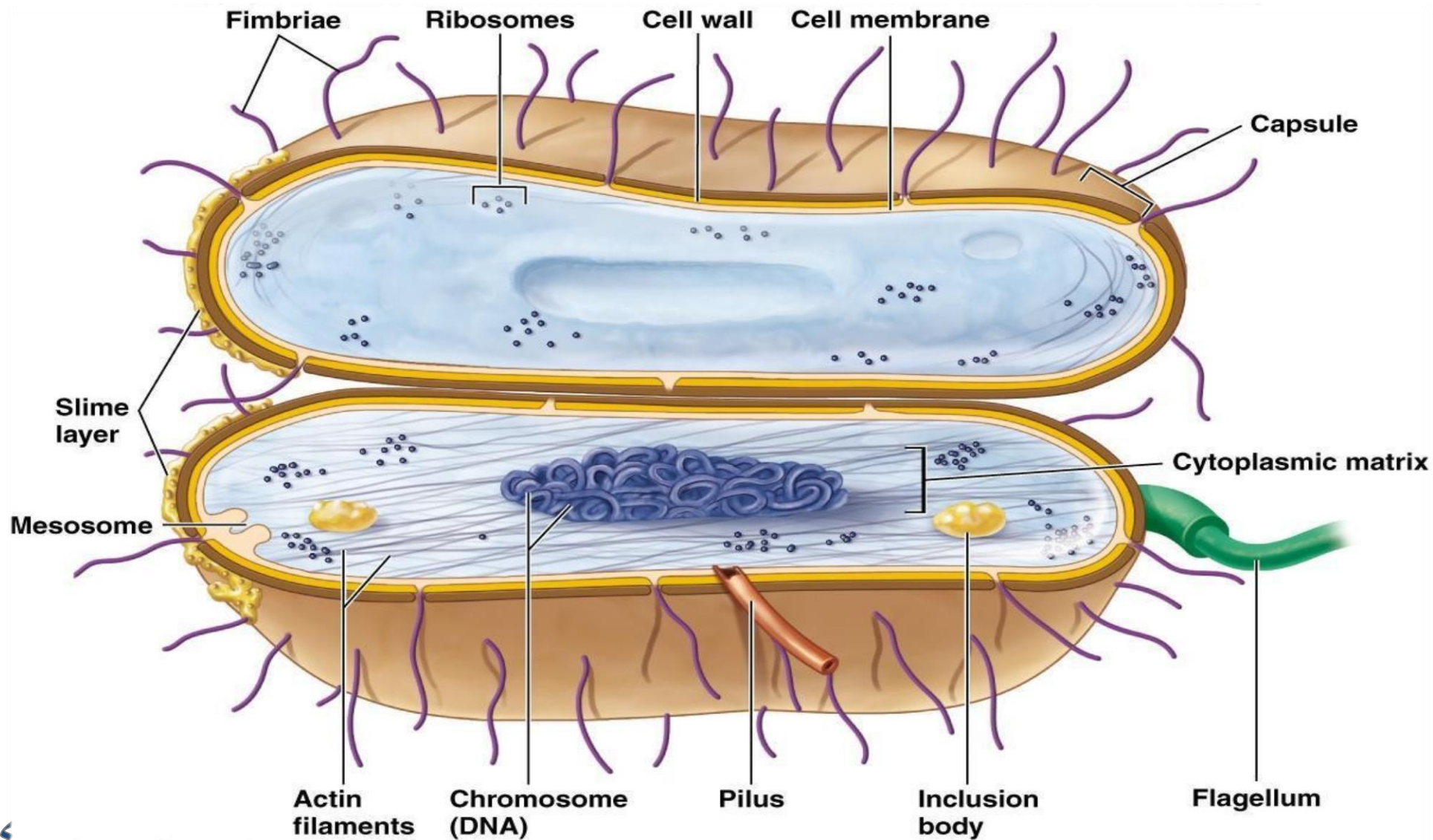

Fimbriae

Cell wall

Circular chromosome

Capsule

Sex pilus

Internal organization

Flagella

STRUCTURE

Capsule.

- ♦- Flagella
- ♦- Pilli
- ♦- Fimbriae

Endospores

Fimbriae Ribosomes Cell wall Cell membrane

Capsule

Slime layer

Mesosome

Cytoplasmic matrix

Actin filaments Chromosome (DNA) Pilus Inclusion body Flagellum
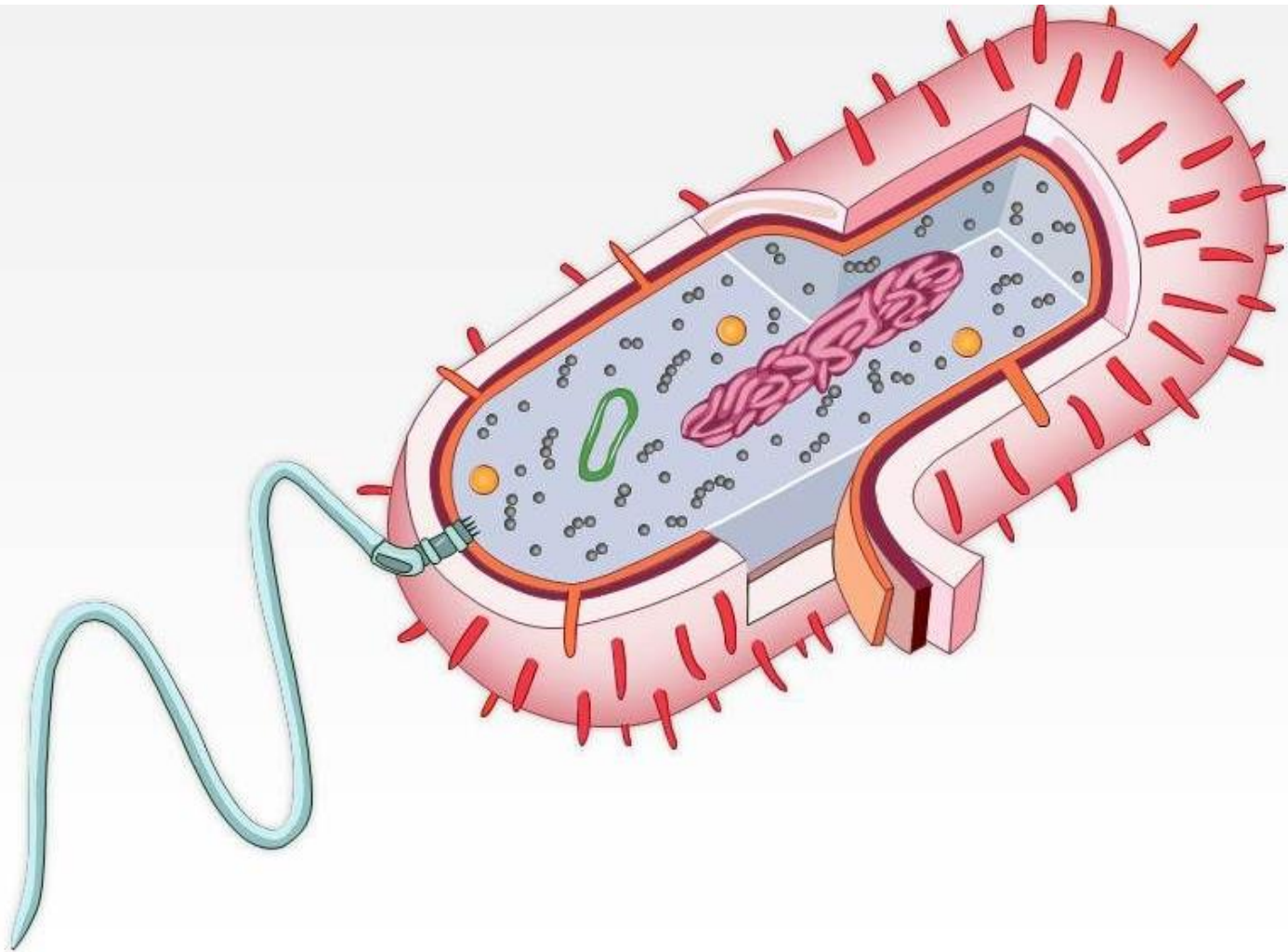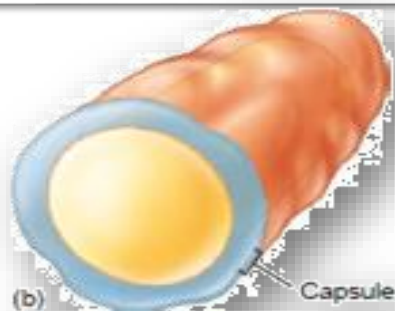
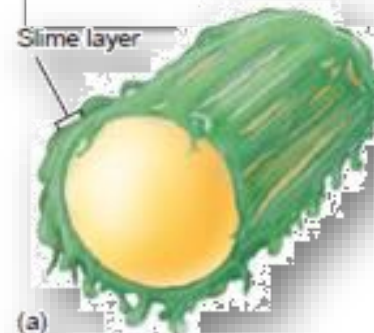# CAPSULE

1. BACTERIAL SURFACE STRUCTURE

CELL ENVELOPE

◉**Glycocalyx** some extracellular material secreted by many bacterial cells in the form of

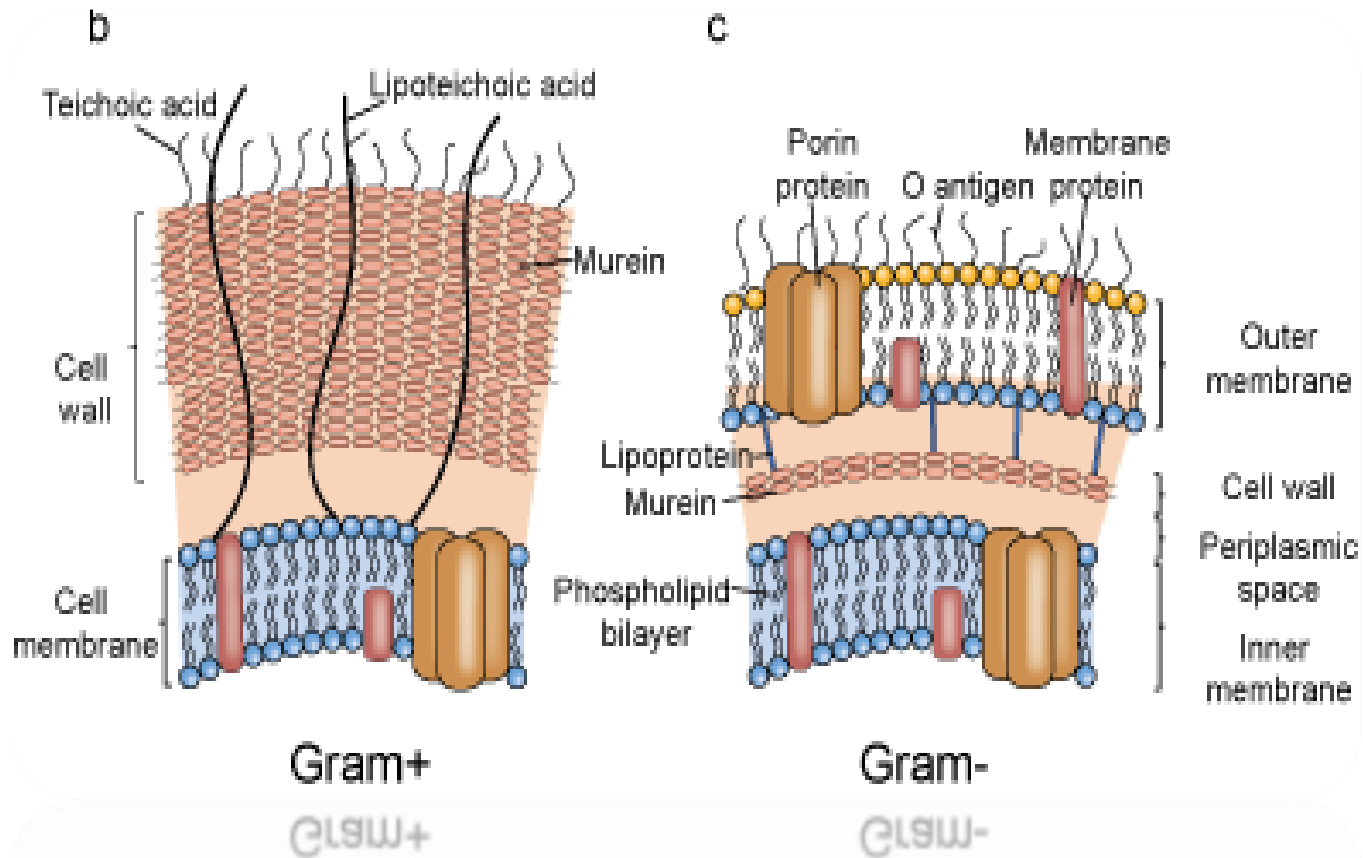**Capsule - attached tightly to the bacterium and has definite boundaries.**

◉**Slime layer - loosely associated with the bacterium and can be easily washed off.**

(b)   Capsule

Slime layer

(a)

٦

COMPOSITIONS

Proteins
sometimes

⊙**Layer of polysaccharide**

b

Teichoic acid   Lipoteichoic acid

Murein

Cell wall

Cell membrane

Gram+

c

Porin protein   Membrane
O antigen protein

Outer membrane

Lipoprotein
Murein

Cell wall

Periplasmic space

Phospholipid bilayer

Inner membrane

Gram-

FUNCTIONS OF THE CAPSULE

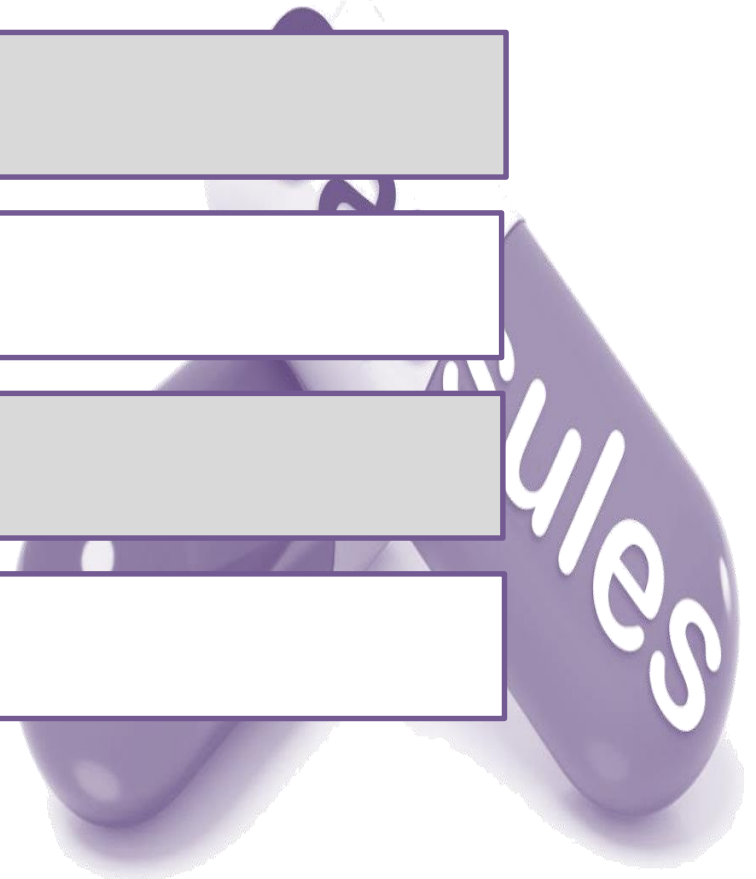1. Protection from phagocytic engulfment.

2. Identification.

3. Vaccine preparation.

4. Tissue attachment.

5. Depot for waste products.

6. Resistance to drying.

MEDICAL IMPORTANCE

RAPID SEROLOGICAL IDENTIFICATION OF

◎Several groups of streptococci

◎Meningococcus

◎*Hemophilus influenzae*

◎*Klebsiella pneumoniae*

◎Some of the coliforms

Yersinia and Bacillus specie

CAPSULE STAIN

WHY WE USE CAPSULE STAIN?

◎ Bacterial capsules are **non-ionic**, so neither <u>acidic</u> or <u>basic</u> stains will adhere to their surfaces.

◎ Because most capsule materials are water soluble, simple stains will not adhere to them.

NOTE:

◎ <u>Older cultures</u> are more likely to exhibit capsule production.

◎ Make sure the culture you take your sample from is at least <u>five days old</u>.

MATERIALS
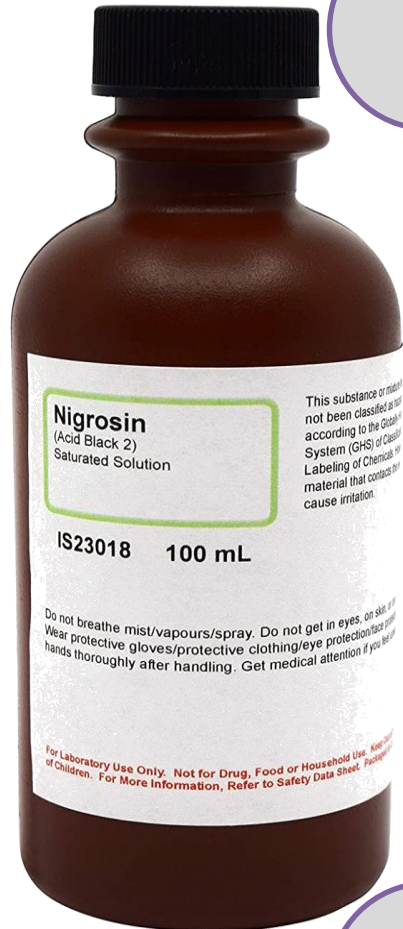
1- Clean slide microscope.

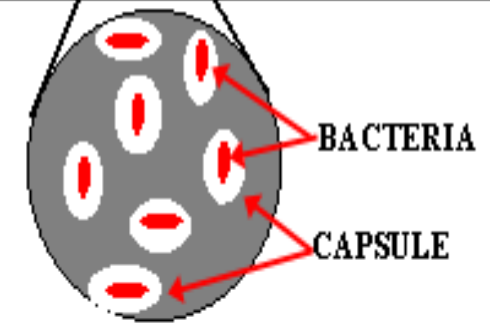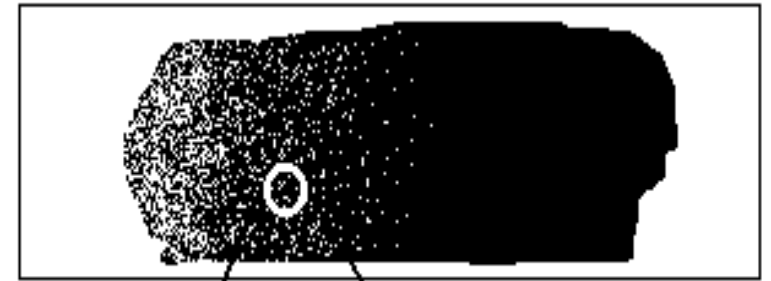2- India Ink (nigrosin) , crystal violet and Copper sulfate (Cuso4).

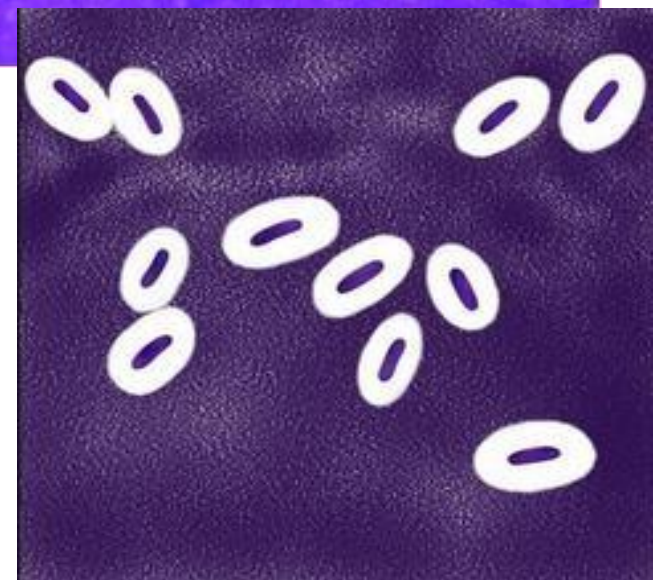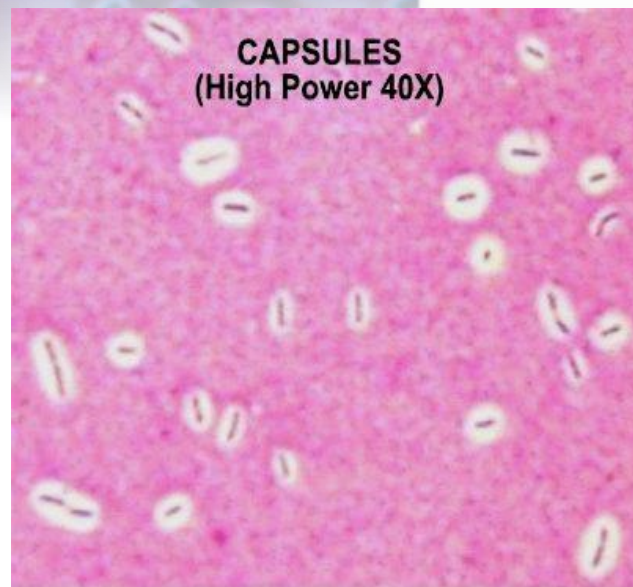3- Bibulous paper.

4- Culture of bacteria.

5- Sterile loop.

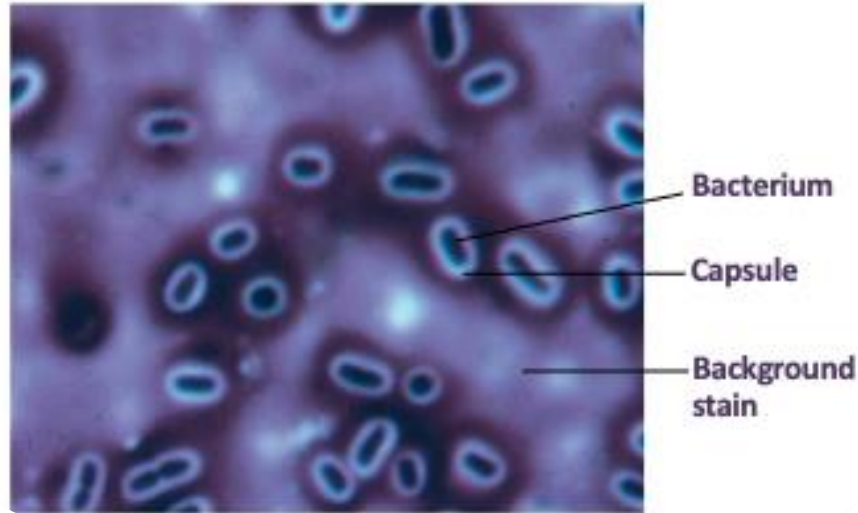MIX BACTERIA & STAIN
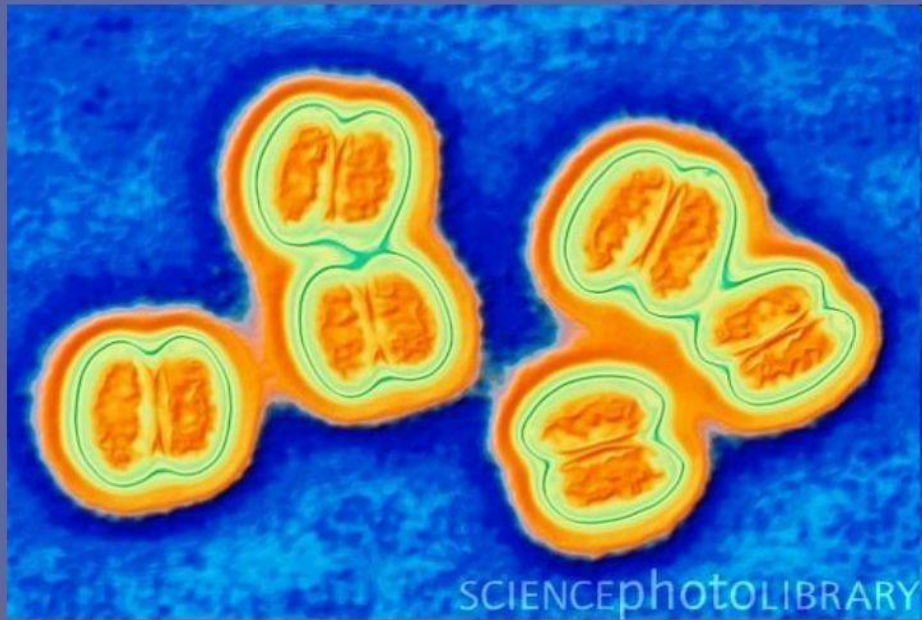
CAPSULE STAINS ARE NOT
HEAT- FIXED

SPREAD MIXTURE

MATERIALS

BACTERIA

CAPSULE

PICTURES OF CAPSULE STAIN

Bacterium
Capsule
Background stain

purple Klebsiella bacterium
refractile (white) capsule

CAPSULES
(High Power 40X)

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Neisseria meningitidis - Gram-negative coccus, non-motile bacteria occur as two cells (orange) in a capsule (yellow)

Haemophilus influenza bacteria in the process of expressing polysaccharide capsules.

نهاية المعمل الثالث

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