Practical Microbiology

Cihan University
Medical Laboratory Analysis

Lab 5: Inspection (Culture characteristics of microbes)

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MSc: Microbiology

Second stage (1st semester)

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Objective

❖**The subject focuses on the inspection process:**

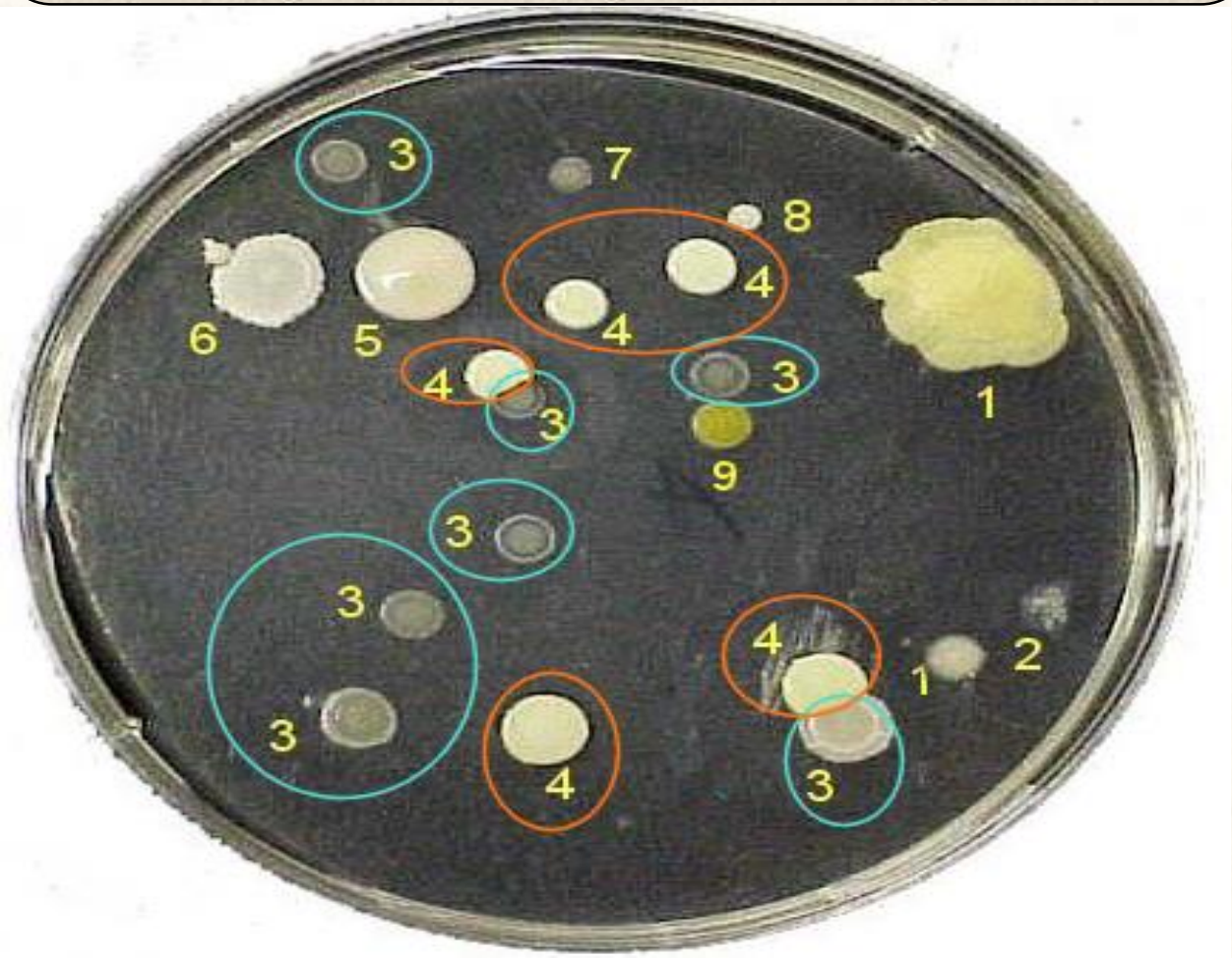
1) Macroscopic features (appearance, size, texture & color and etc.. of the isolated colonies on different types of media (petri plates, slant agar) and types of growth patterns in broth media.

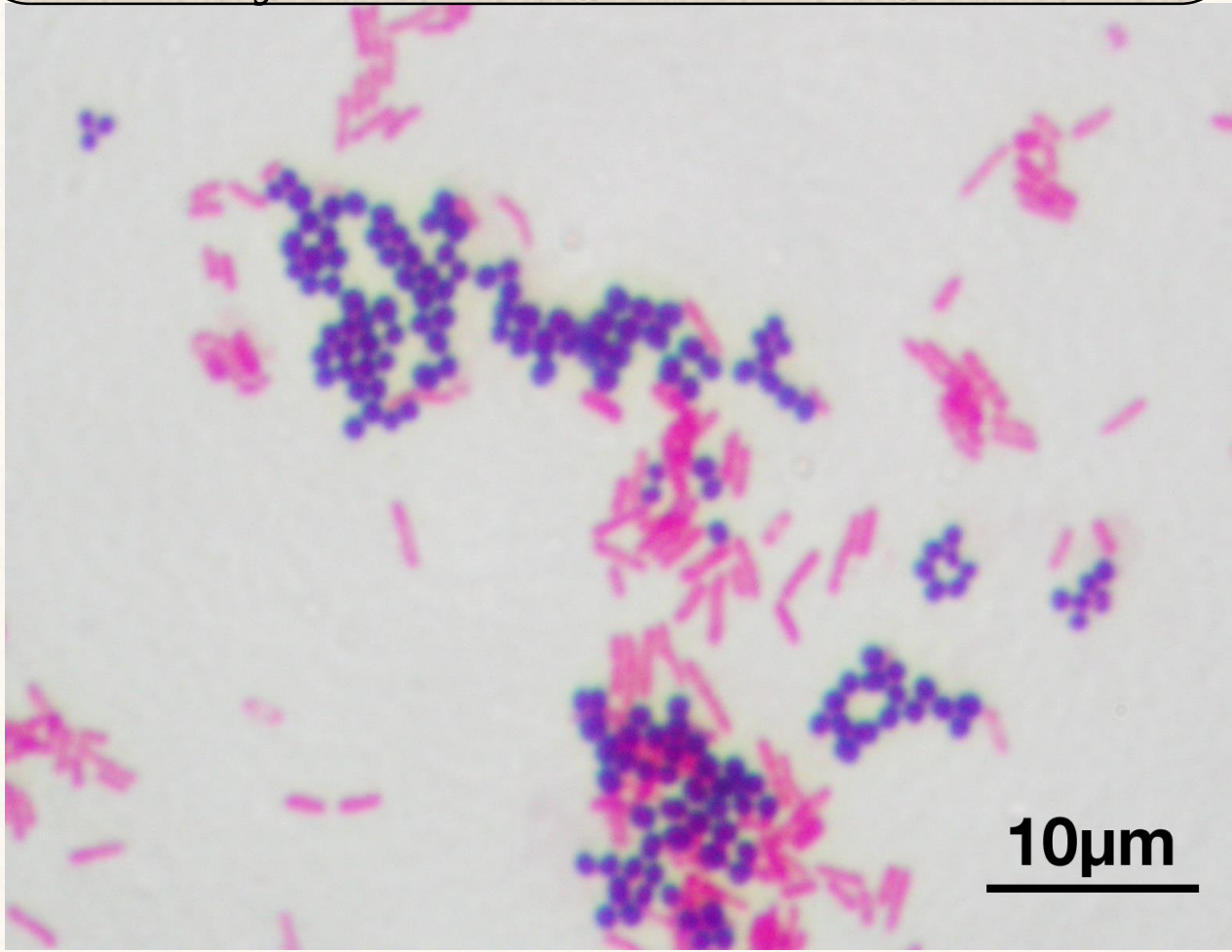
2) Microscopic features (next week).

Inspection

- Macroscopically observe cultures to note color, texture, size, shape, elevation & etc. of isolated colonies.

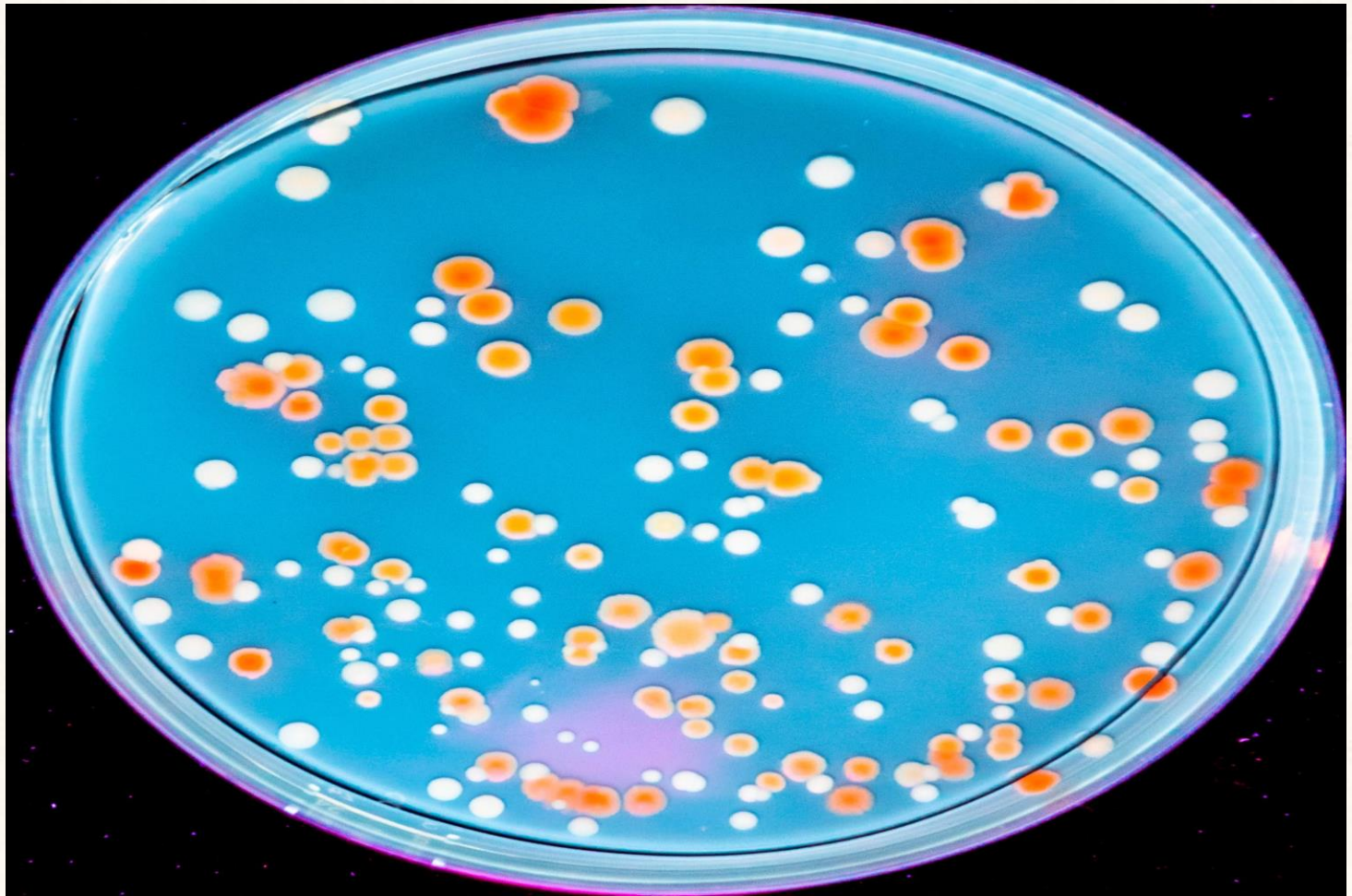
- Microscopically observe stained slides of the culture use microscope to know cell shape, size, arrangement and motility.





Culture characteristics

- When a single bacterial culture is grown using different forms of media (plate, slants deep tube and broth), it displays a collective pattern of growth that is unique to its species.
- This unique pattern of growth is referred to as its **Culture Characteristics**.



Culture characteristics

- An organism’s culture characteristics can help distinguish it from other organisms, since each bacterial species typically has a unique pattern of growth.
- Although useful, culture characteristics alone cannot be relied on to identify many species of bacteria.
- They must be combined with:

✓Staining techniques.

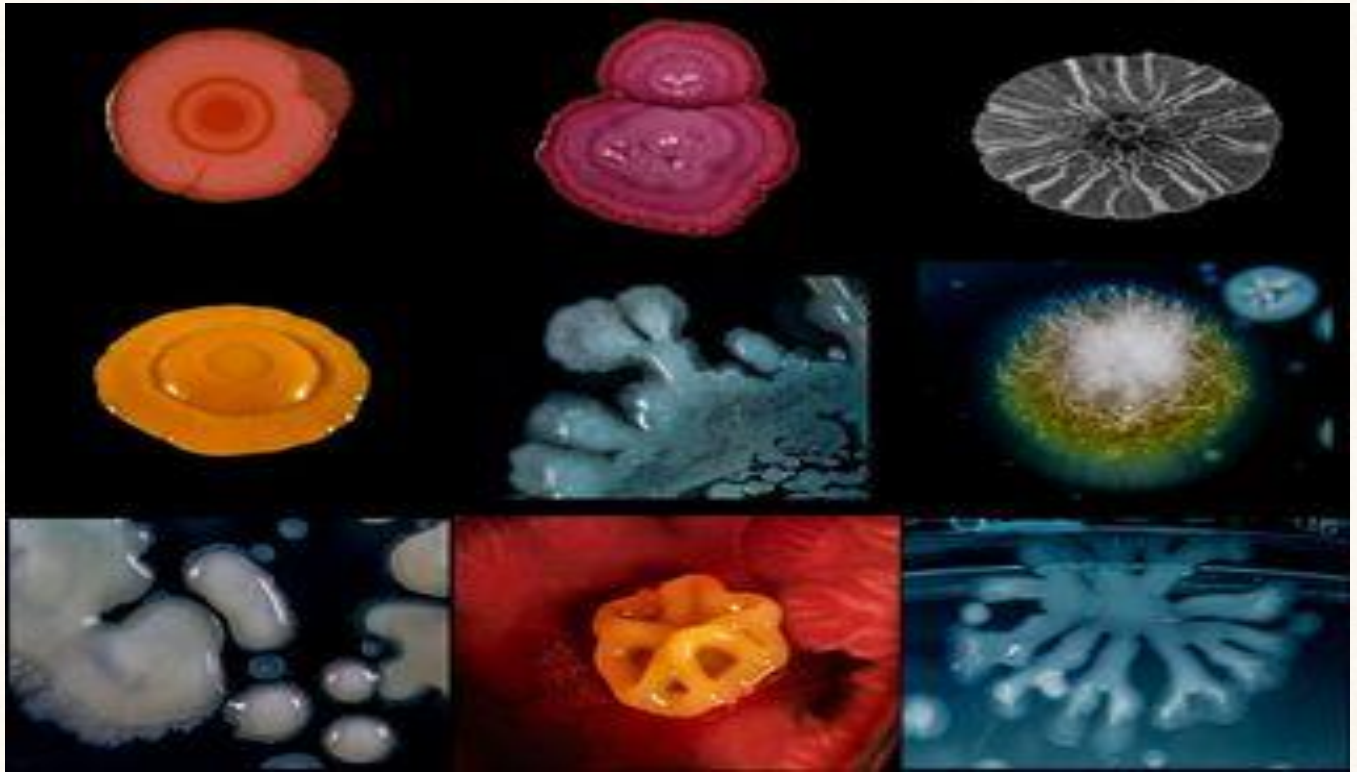
✓Biochemical tests.

✓Serological tests.

✓molecular tests.

Colony morphology

- Colony morphology is the visual culture characteristics of a bacterial colony on an agar plate or slant.
- Observing colony morphology is an important skill used in the microbiology laboratory to know the microorganisms.
- **Colonies need to be well isolated** from other colonies to observe the characteristic shape, size, color, surface appearance, and texture.

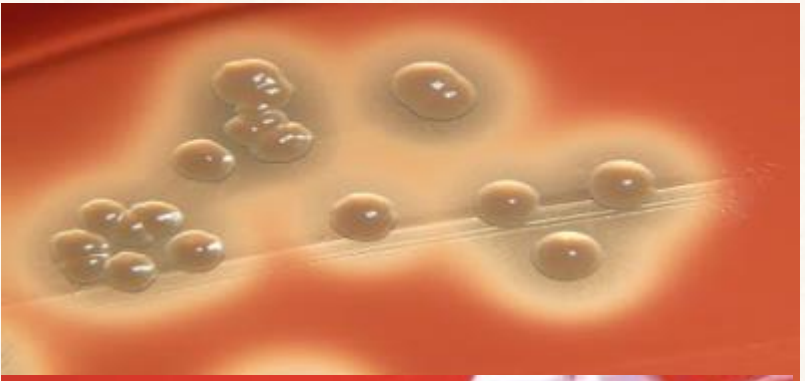


Colony morphology on agar plates

These demonstrate well isolated colonies and are evaluated in the following manner.

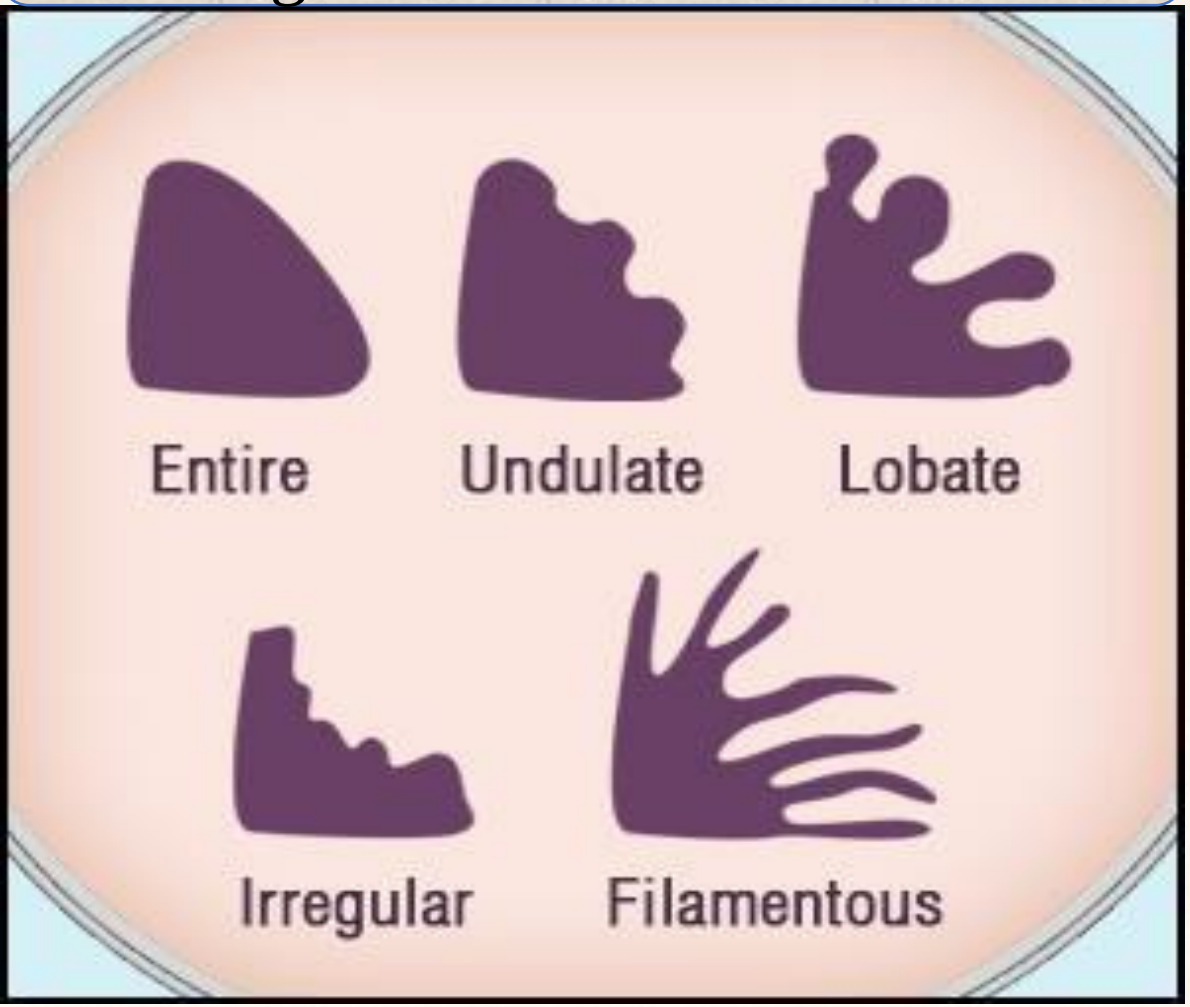
1) Size: large (>1mm), medium (approximately =1mm), small (<1mm), punctiform or pinpoint (<0.5mm).

2) Color: pigmented: red, pink, purple, non-pigmented: white, creamy, opaque, tan.

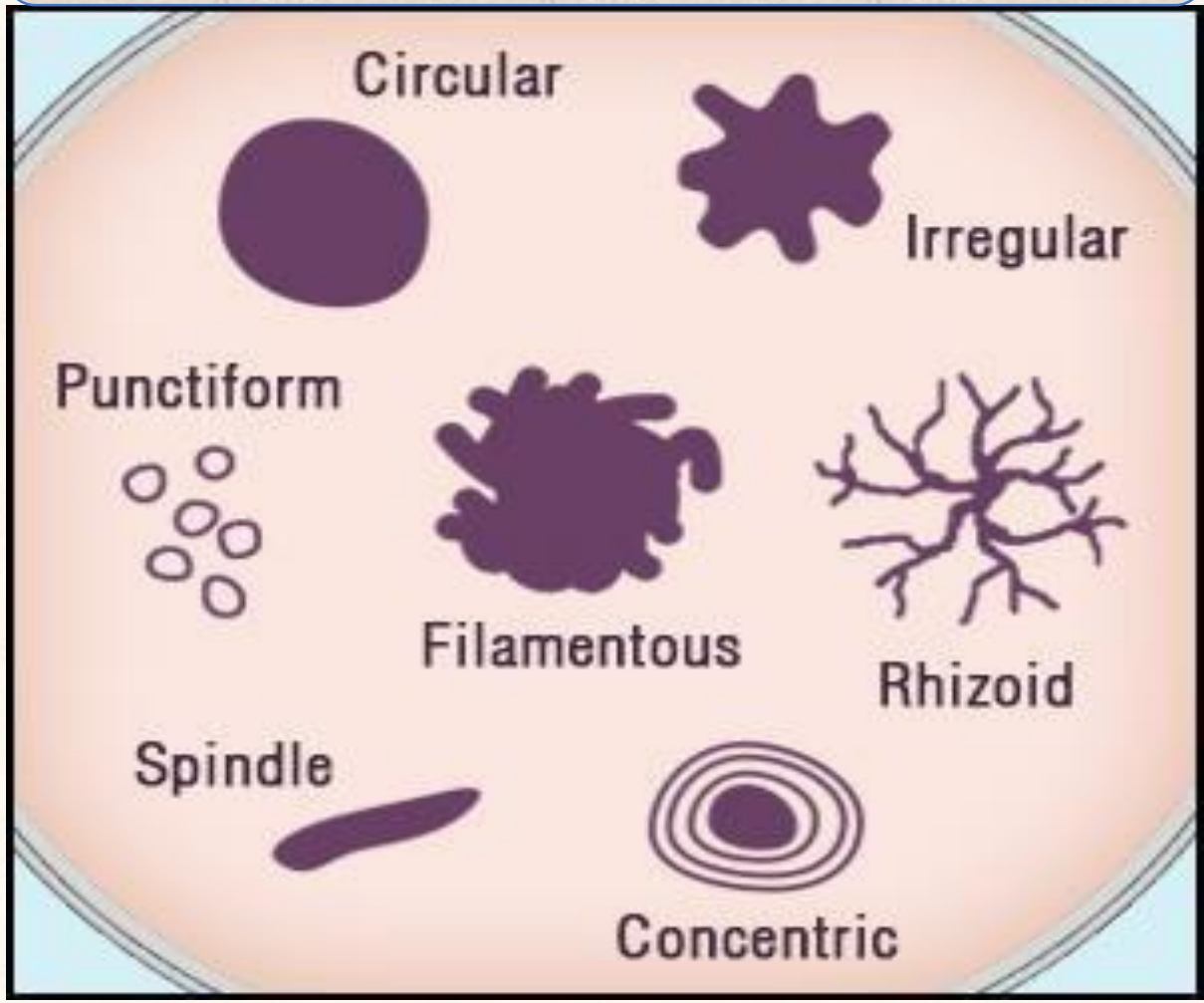


Colony morphology on agar plates

3) Margin: The appearance of the outer edge of the colonies.



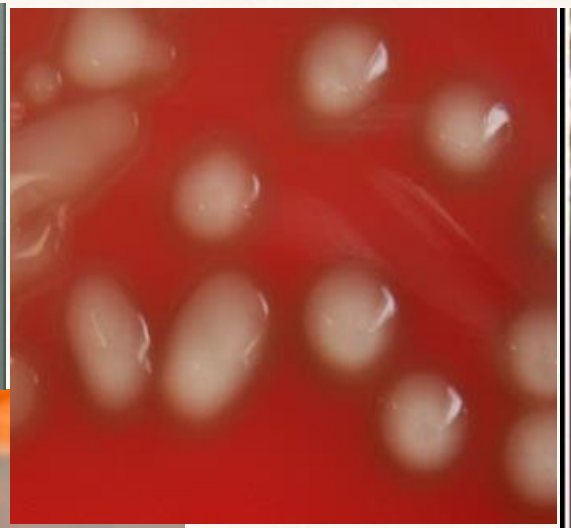
4) Form: entire form of the colonies.

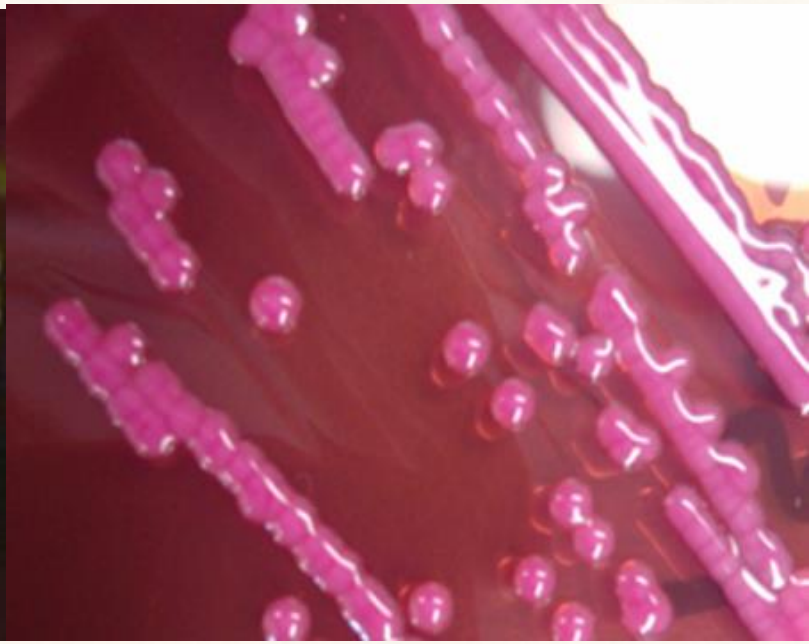


Colony morphology on agar plates

5) Elevation: the degree to which the colony growth is raised on the surface.

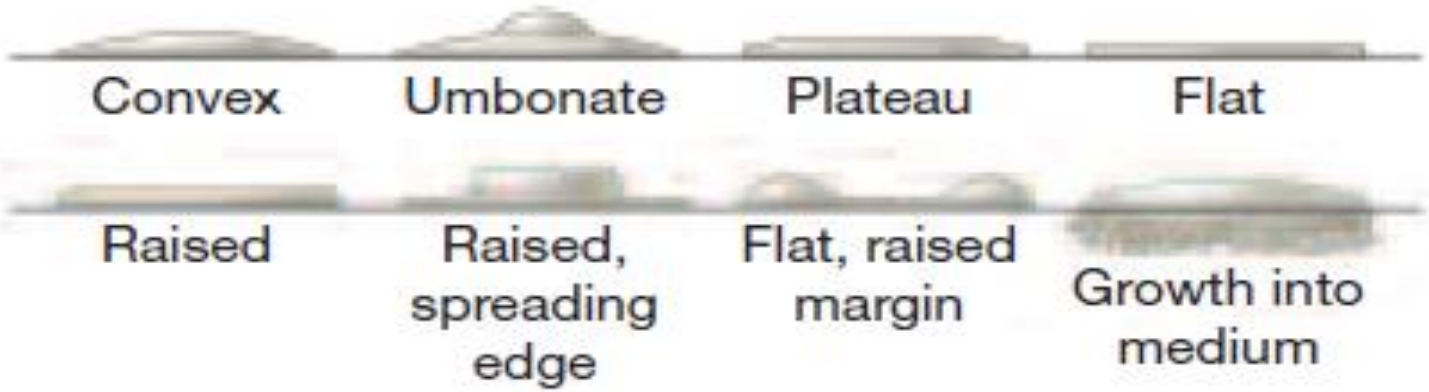
6)Surface appearance: shiny (glistening)**,** dull**,** smooth, rough, wrinkled, mucoid.





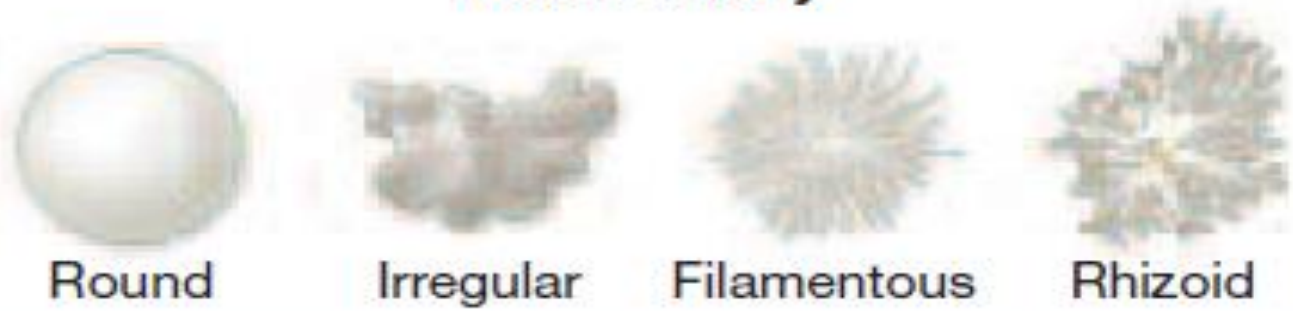
Shape	 Circular, Rhizoid, Irregular, Filamentous, Spindle
Margin	 Entire, Undulate, Lobate, Curled, Filiform
Elevation	 Flat, Raised, Convex, Pulvinate, Umbonate, Crateriform
Size	 Punctiform, Small, Moderate, Large
Texture	Smooth or rough
Appearance	Glistening (shiny) or dull
Pigmentation	Nonpigmented (e.g., cream, tan, white) Pigmented (e.g., purple, red, yellow)

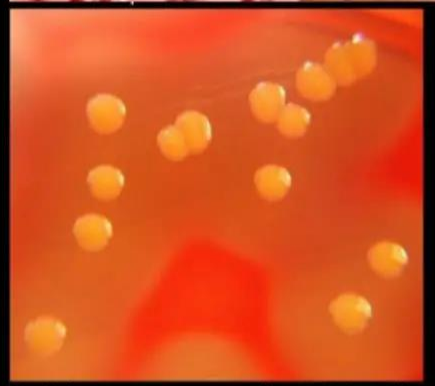
Elevation



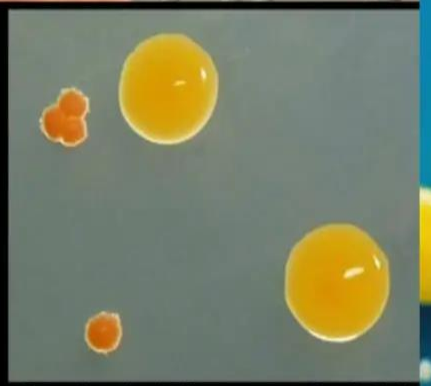
Margin

Whole colony





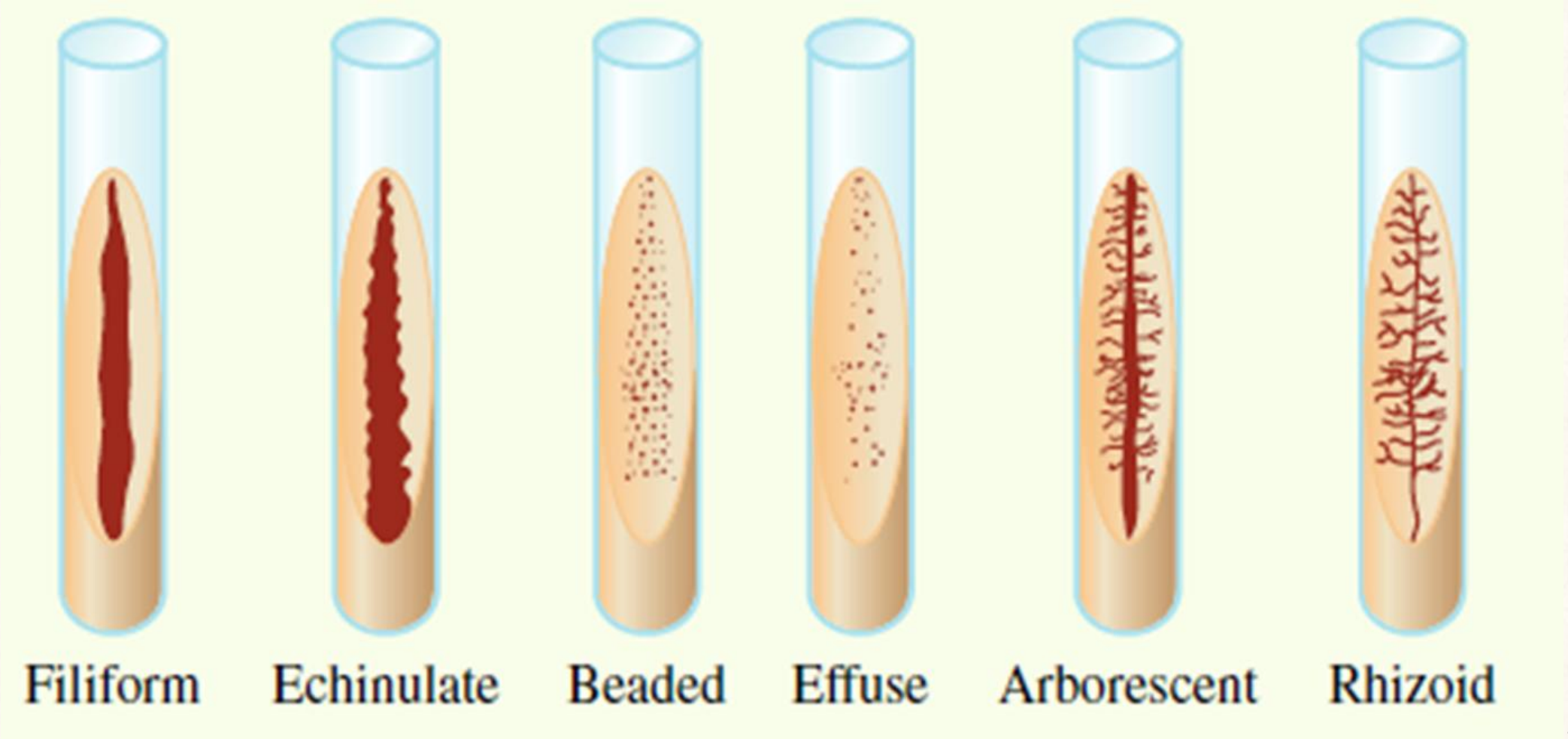
Staphylococcus aureus yellow staphyloxanthin



Chryseobacterium indologenes yellow flexirubin

Colony morphology on agar slants

- **Degree of growth :** scanty, moderate, abundant.
- **Form of growth:** filiform, echinulated, beaded, effuse, arborescent & rhizoid.



Filiform Echinulate Beaded Effuse Arborescent Rhizoid

Culture characteristics in liquid media

❖The liquid medium (nutrient broth, peptone water and other liquid media) the following characteristics are noted:

➢The degree of growth : scanty, moderate, abundant.

➢Presence of turbidity and its nature:

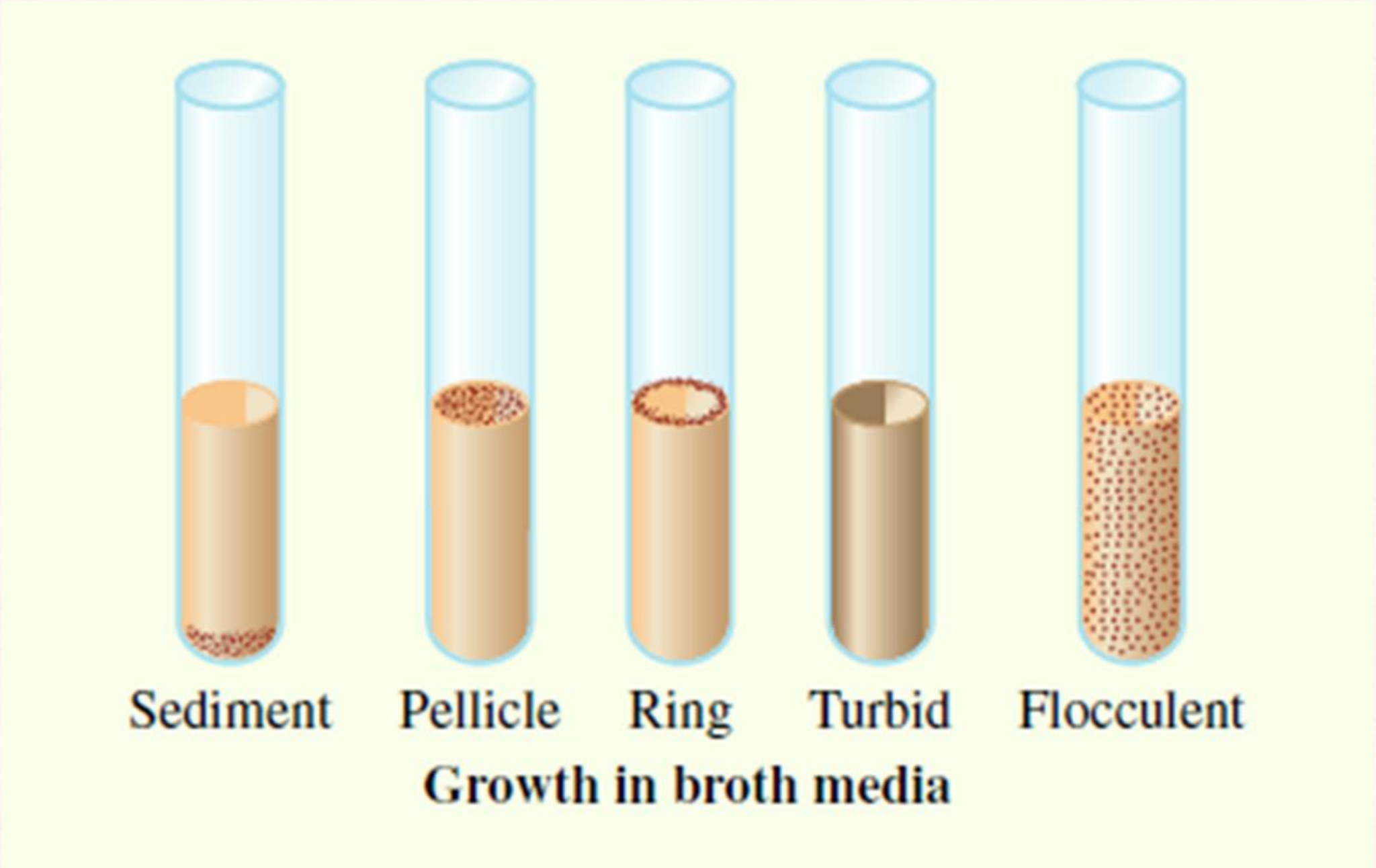
✓Uniform time turbidity : finely dispersed throughout.

✓Flocculent: flank aggregates, dispersed throughout.

✓Pellicle: thick, pad like growth on the surface.

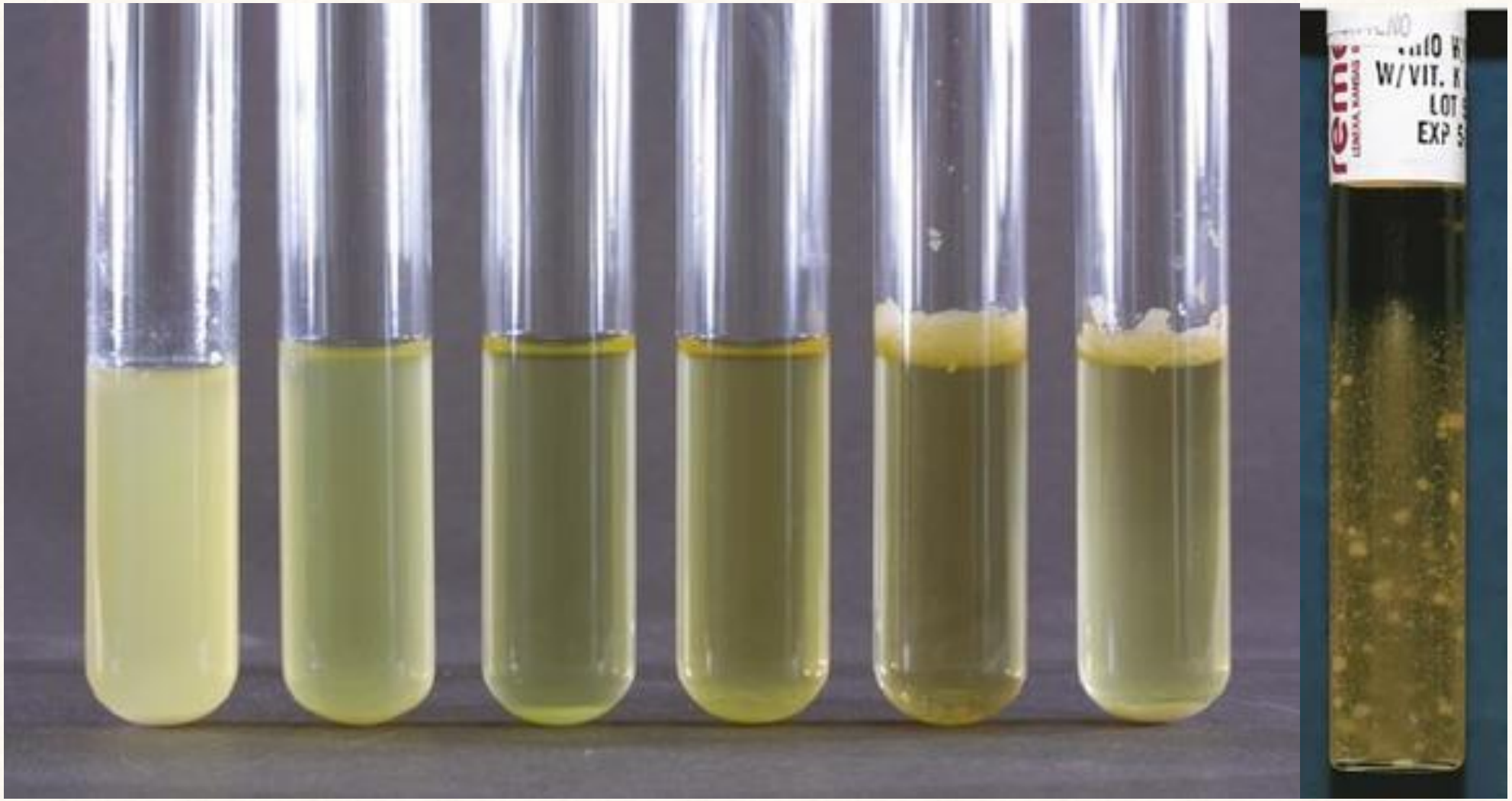
✓Ring: a circular shaped growth on the surface.

✓Sediment: concentration of growth at the bottom of broth cultures may be granules.



Growth in broth media

Growth patterns in broth media



References

- ✓Bauman, R.W. and Primm, T.P. (2018).Microbiology with diseases by body system. Pearson. USA.
- ✓Leboffe, M.J. and Pierce, B.E., 2011. A photographic atlas for the microbiology laboratory. Morton Publishing Company.
- ✓http://courseware.cutm.ac.in/wp-content/uploads/2020/06/3.CULTURAL-CHARACTERISTICS-OF-MICROORGANISMS-converted.pdf
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