Bacterial Colony type And Characteristics Morphology Shape and Arrangement

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Introduction

- Bacteria grow on solid media as colonies. A **colony** is defined as a visible mass of microorganisms all originating from a single mother cell, therefore a colony constitutes a clone of bacteria all genetically alike.
- In the identification of bacteria and fungi much weight is placed on how the organism grows in or on media.
- **Colony morphology** : Examination of the form and structure(cultural characteristics) of bacterial colonies on an agar plate.
- Features of the colonies may help to pinpoint the identity of the bacterium. Different species of bacteria can produce very different colonies.

Colony morphology

- Shape
- Size
- Margin/edge
- Elevation/height
- Color
- Texture /consistency
- Appearance
- Optical property/ opacity

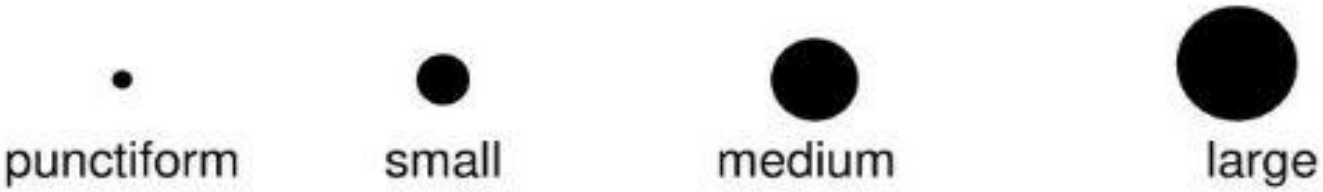
Colony shape

- **Shape** refers to the overall appearance of the colonies.
- The descriptors here are circular, irregular, filamentous (has individual thin projections), rhizoid (has thin, branching projections), or spindle (lens-shaped).

Colony size

Colony size depend on:

- The growth medium
- The number of colonies present on a plate



Colony margin/edge

- The margin or edge of a colony may be an important characteristic in identifying an organisms.
- Common examples are Entire (smooth), irregular, Undulate (wavy), Lobate, Curled, Filiform etc.
- Colonies that are irregular in shape and/or have irregular margins are likely to be motile organisms. Highly motile organism swarmed over the culture media. Such as *Proteus* spp

Colony elevation/height

- It is description of how the colony grows vertically.
- Colonies may be flat, raised, umbonate (having a knobby protuberance), Crateriform, Convex, Pulvinate (Cushion-shaped)

Colony color/pigmentation

- Some bacteria produce pigment when they grow in the medium e.g., green pigment produces by *Pseudomonas aeruginosa*, buff colored colonies of *Mycobacterium tuberculosis* on L.J medium, red colored colonies of *Serratia marcescens*.

Consistency/texture

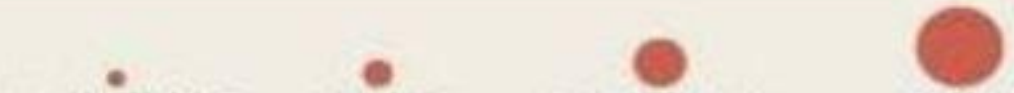
- Several terms that may be appropriate for describing the texture or consistency of bacterial growth are: dry, moist, viscid (sticks to loop, hard to get off), brittle/friable (dry, breaks apart), mucoid (sticky, mucus-like)

Appearance of the colony surface

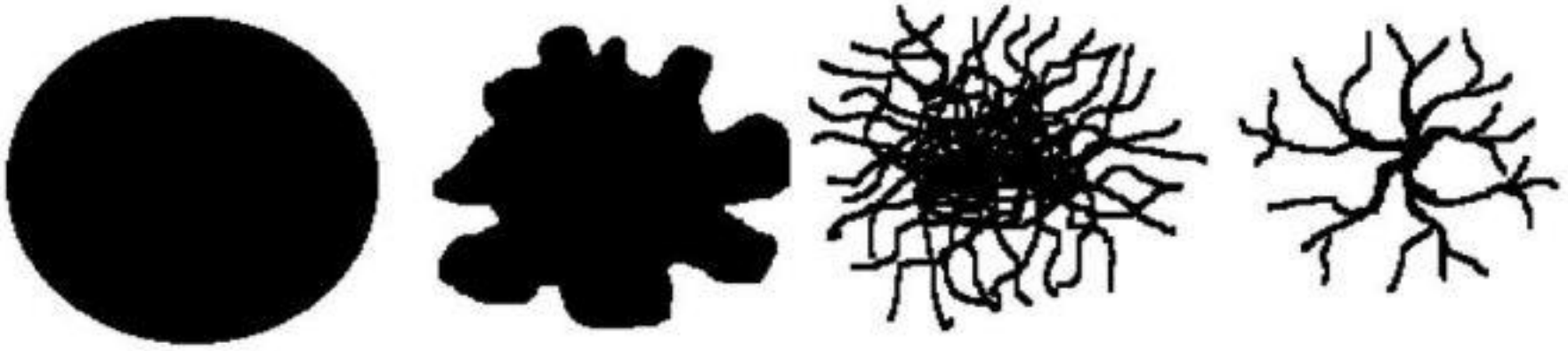
- Bacterial colonies are frequently shiny and smooth in appearance. Other surface descriptions might be: dull (opposite of glistening), veined, rough, wrinkled (or shriveled), glistening.

Optical property/opacity

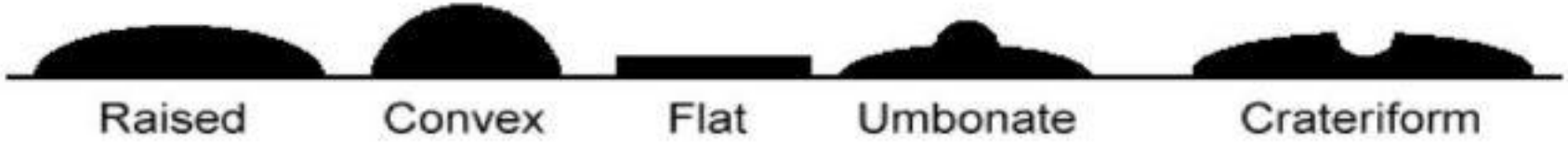
- Is the colony transparent (clear), opaque (not transparent or clear), translucent (almost clear, but distorted vision–like looking through frosted glass), iridescent (changing colors in reflected light).

Shape	 Circular, Rhizoid, Irregular, Filamentous, Spindle
Margin	 Entire, Undulate, Lobate, Curled, Rhizoid, Filamentous
Elevation	 Flat, Raised, Convex, Pulvinate, Umbonate
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)
Optical property	Opaque, translucent, transparent

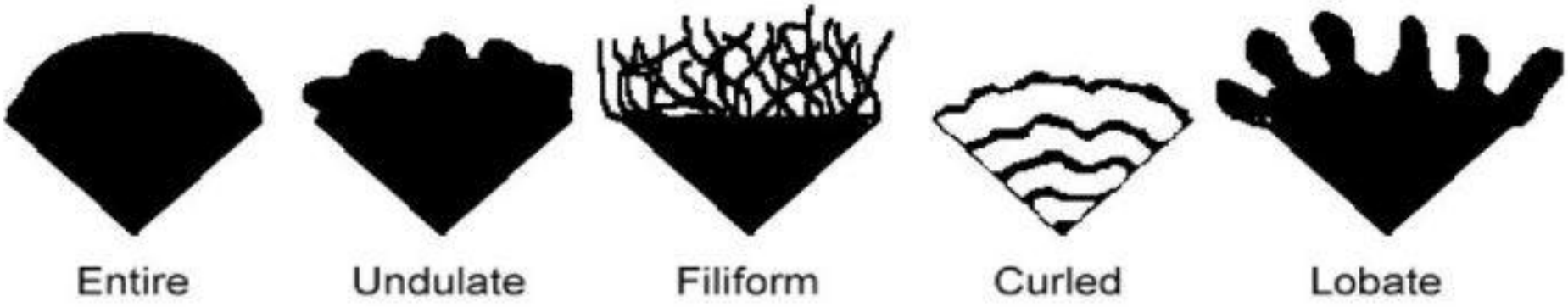
Form



Elevation



Margin

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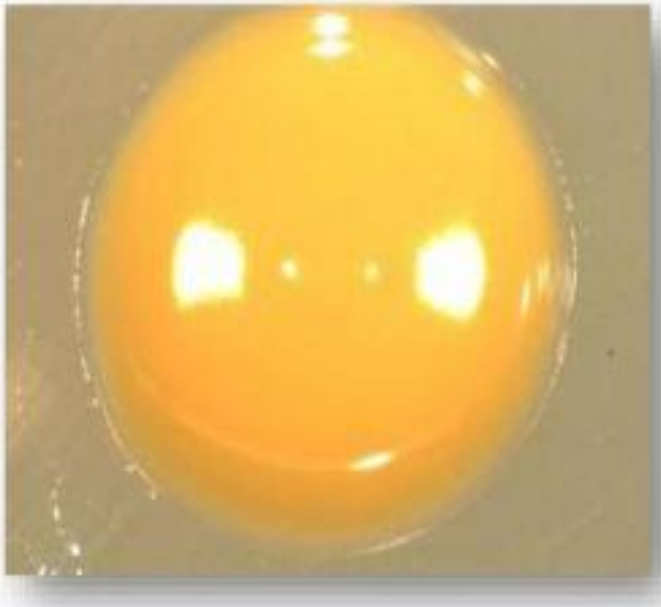
- **Stereoscopic microscope** a binocular microscope modified to give a three-dimensional view of the specimen.
- **Objectives:**
  - Describe features of colonies.
  - See variations in colonial morphology among various species of bacteria.
- **Materials needed**:
  - agar plates of various bacteria (*Micrococcus, Streptococci ,Staphylococci, E. coli, Pseudomonas, B. cereus, and B. subtilus*).

- **Procedures:**
  - Use a plate which has well-isolated colonies. Look at the largest colonies with the naked eye to determine general shape and chromogenesis.
  - Use a dissecting/stereoscopic microscope for more detail. Place the plate rightside up on the stage, leaving the petri dish cover ON (Otherwise, your culture will become contaminated.) There are 2 lenses on our scopes—10X and 20X: the black lens knob is on the right side of the head of the microscope. The magnification is especially helpful for the study of elevation, surface, opacity, size, and edge. There are 2 lights on these microscopes that you might find helpful, either using one at a time, or both, or even sometimes without them. Two small black rotating knobs on either side of the base control the 2 lights, one light from above and one light from below the stage.

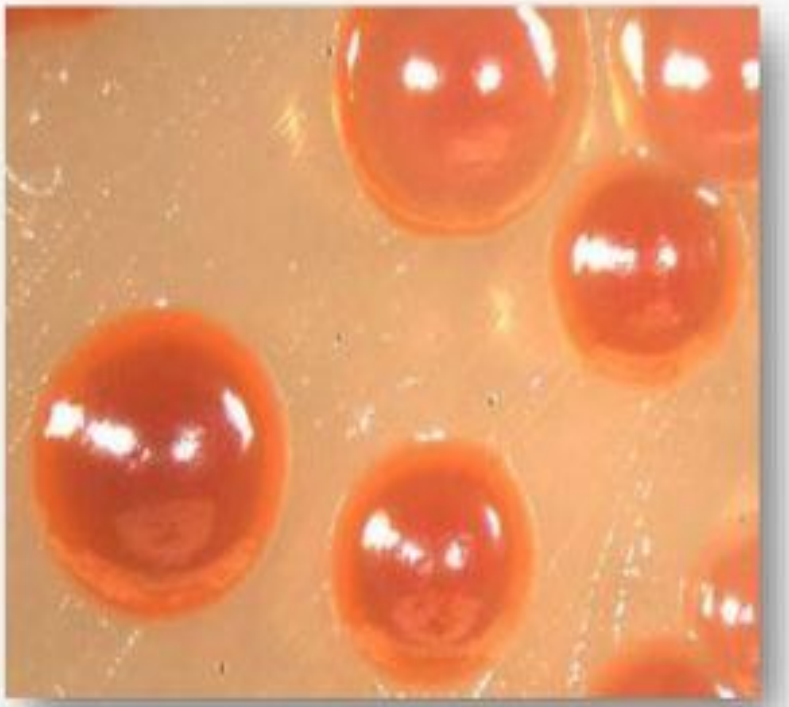
- If you see water condensation on the lid cover, take a KimWipe and carefully remove the water from the cover, then quickly replacing the cover on the dish.
- In order to determine consistency, you need to use your inoculating loop or needle to pick up the colony and determine the consistency of the inoculum material as the loop leaves the agar medium.

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Convex
Colony color (pigment)	Golden yellow color
Colony surface	Smooth



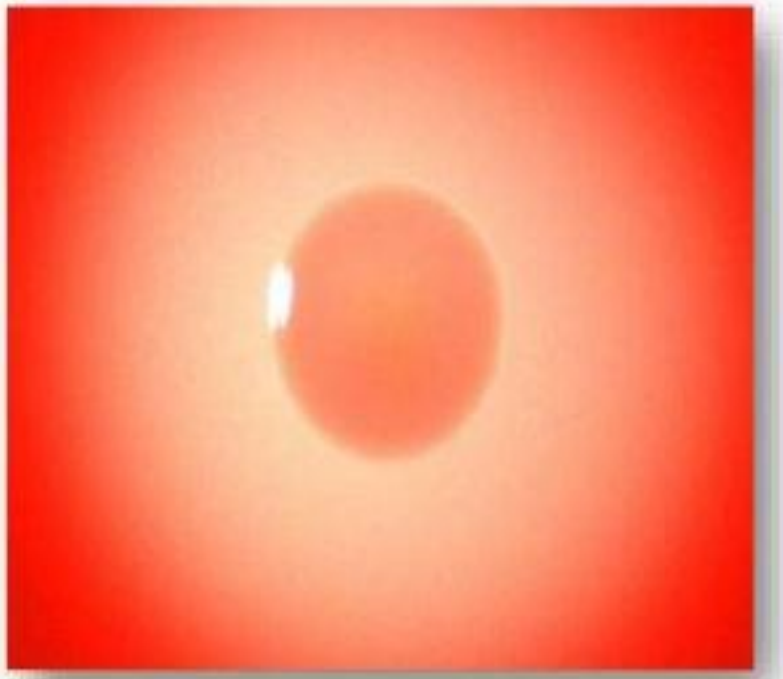
Staphylococcus aureus

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Convex
Colony color (pigment)	Red color
Colony surface	Smooth



Serratia marcescens

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Raised
Colony color (pigment)	White color
Colony surface	Smooth



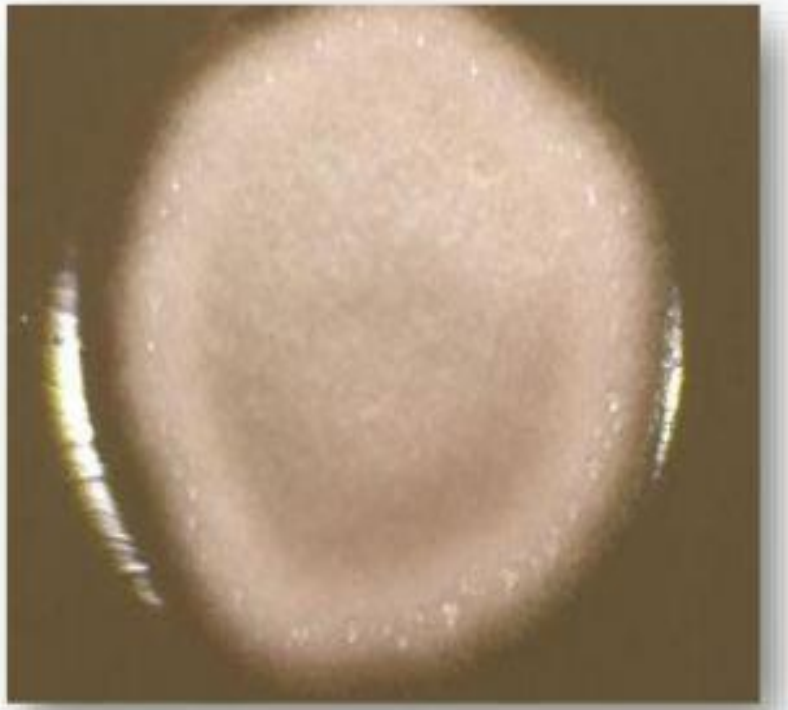
Streptococcus pneumoniae

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	convex
Colony color (pigment)	white color
Colony surface	Smooth

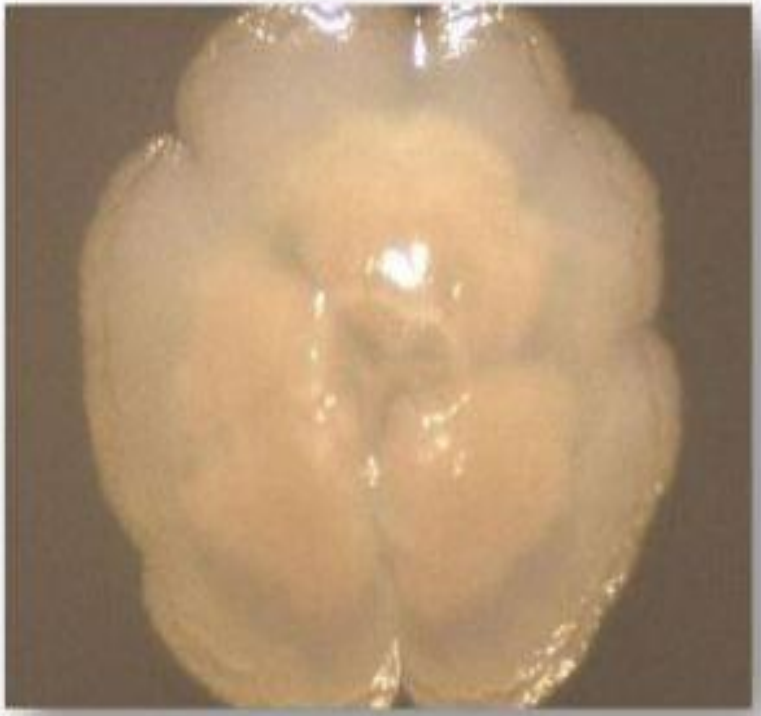
Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Umbonate
Colony color (pigment)	Red color
Colony surface	Smooth

Description	Result
Colony shape	Filamentous form
Colony margin	Filiform margin
Optical property	Opaque
Colony elevation	Weak convex
Colony color (pigment)	White color
Colony surface	Wrinkled

Description	Result
Colony shape	Filamentous form
Colony margin	Filiform margin
Optical property	Opaque
Colony elevation	Weak Umbonate
Colony color (pigment)	Beige color
Colony surface	Wrinkled

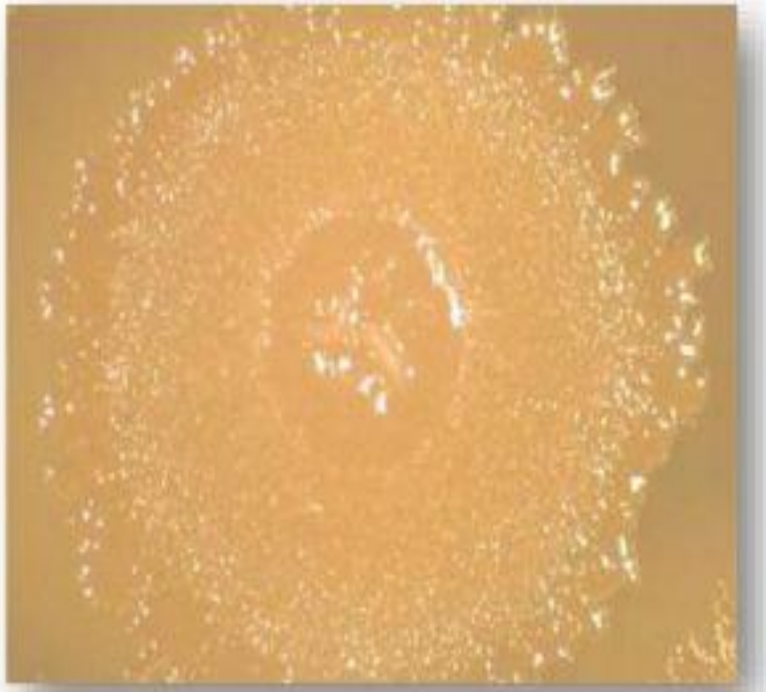


Description	Result
Colony shape	Irregulare form
Colony margin	Undulate margin
Optical property	Opaque
Colony elevation	Weak Umbonate
Colony color (pigment)	White color
Colony surface	Smooth



Description	Result
Colony shape	Weak Irregular
Colony margin	Undulate margin
Optical property	Opaque
Colony elevation	Weak Umbonate
Colony color (pigment)	White color
Colony surface	Smooth

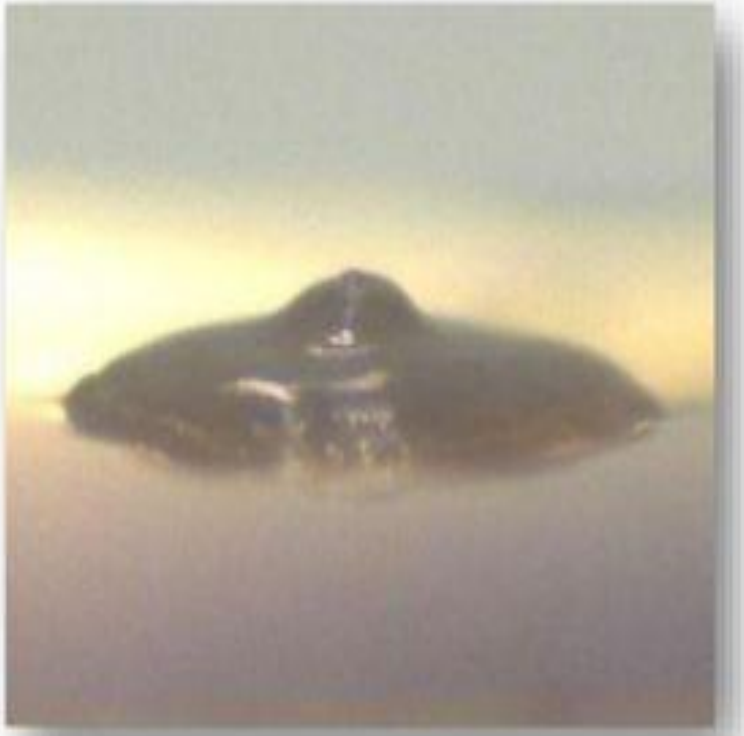
Description	Result
Colony shape	Irregular form
Colony margin	Lobate margin
Optical property	Opaque
Colony elevation	Weak Umbonate
Colony color (pigment)	Yellowish color
Colony surface	Smooth



Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Pulvinate
Colony color (pigment)	Black color
Colony surface	Smooth

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Weak Umbonate
Colony color (pigment)	Red color
Colony surface	Smooth

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Umbonate
Colony color (pigment)	Grayish color
Colony surface	Smooth



Description	Result
Colony shape	Irregular form
Colony margin	Undulate margin
Optical property	Opaque
Colony elevation	Pulvinate
Colony color (pigment)	Yellow color
Colony surface	Rough

Mycobacterium tuberculosis

Description	Result
Colony shape	Rhizoid form
Colony margin	Filiform margin
Optical property	Opaque
Colony elevation	Raised
Colony color (pigment)	White color
Colony surface	Rough

Description	Result
Colony shape	Circular form
Colony margin	Entire margin
Optical property	Opaque
Colony elevation	Flat
Colony color (pigment)	Gray color
Colony surface	Smooth

Pseudomonas aeruginosa

Thank You