

## Cultural characteristics

When a single bacterial cell is deposited on a solid or in a liquid medium, it begins to divide. One cell produces two, two produce four, and four produce eight, and so on.

Eventually, a colony appears where the original organism was. When grown on a variety of media, microorganisms will exhibit visible physical differences in appearance in their isolated colonies and their growth. These differences are called cultural characteristics or morphology. Cultural characteristics or morphology may be used as an aid in identifying and classifying some organisms.

Cultural characteristics or morphology are determined by culturing microorganisms in nutrient broth and on nutrient agar plates and slants. After incubation, the characteristics are observed.

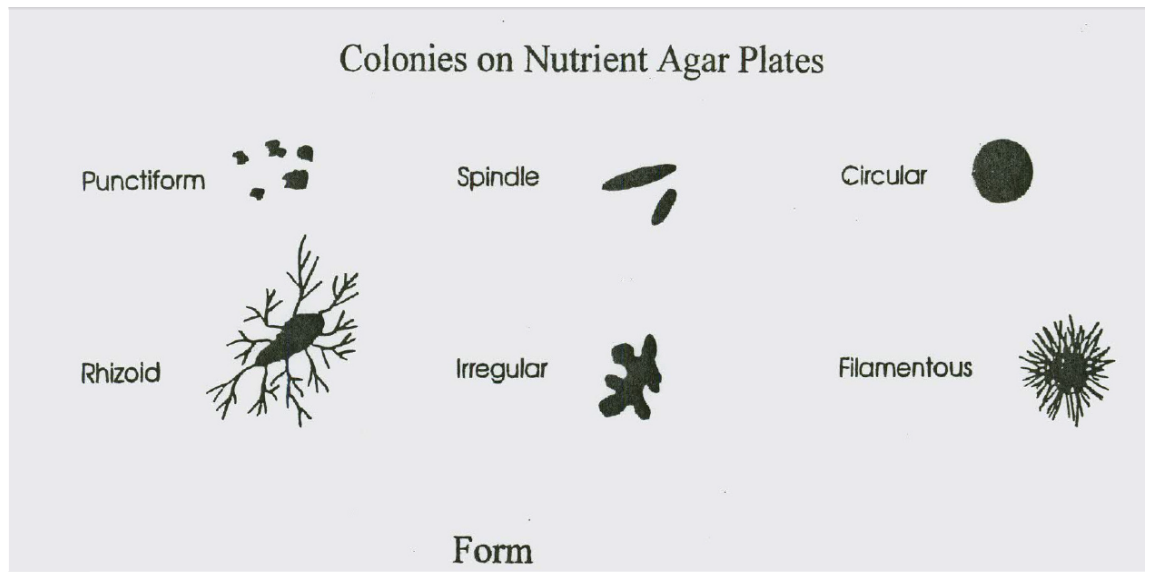
### A-Growth Patterns on Agar

**1- Size:** The colonies differ in their diameter; some of them are very small as a pinhead, while the other is large ranging.

So according to size the colonies could as described to pinpoint, small, moderate, large.

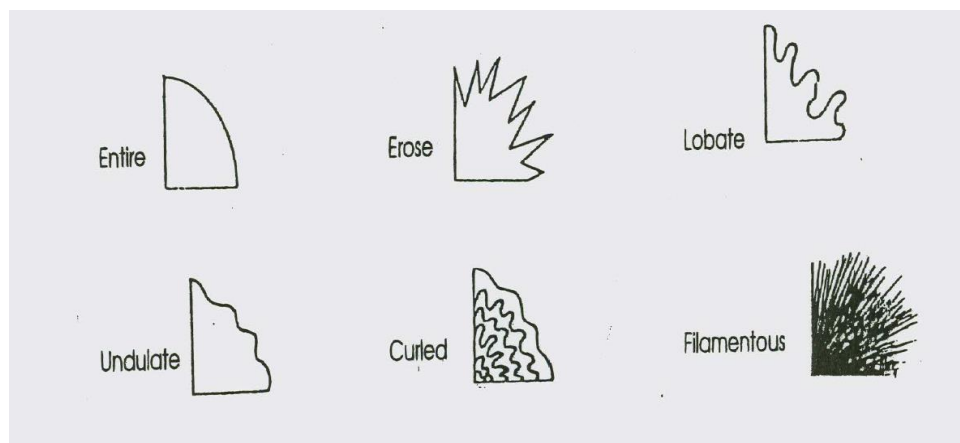
**2- Form:** The colonies differ in their shapes according to the germ species as below:

- a. circular – unbroken, peripheral edge
- b. irregular – indented, peripheral edge
- c. rhizoid – root-like, spreading growth
- d. punctiform - tiny
- e. filamentous
- f. spindle



**C- Margin:** The appearance of the outer edge of the colony

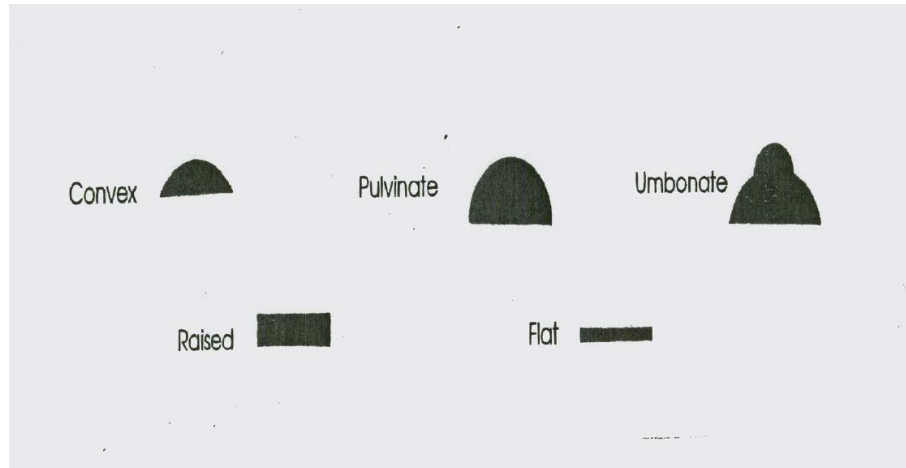
- a. entire – smooth
- b. lobate – marked indentation (lobed)
- c. undulate – wavy indentation
- d. serrate or erose – tooth-like appearance
- e. curled
- f. rhizoid – root-like
- g. filamentous – threadlike, spreading edge



**D- Elevation:** which the colony growth is raised

- a. flat – elevation not discernable
- b. raised – slightly elevated

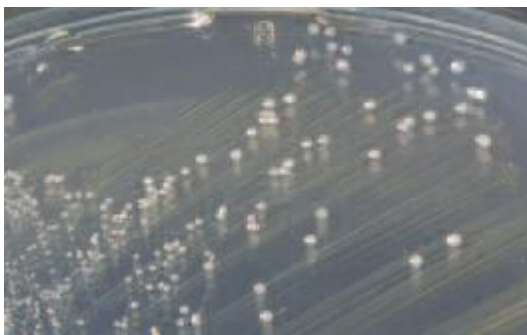
- c. convex – dome-shaped
- d. umbonate – raised, with elevated convex center region
- e. pulvinate – very convex



**E-Pigmentation -color of colony:** The colonies differ in their color according to their pigments produced by the germ cell; they may be red, yellow or brown.

**F- Consistency:** The colonies may be aqueous, sticky, solid and membrane in some times.

**G- Optical properties:** The colonies may be opaque, translucent (clear), translucent or shiny (brightness).



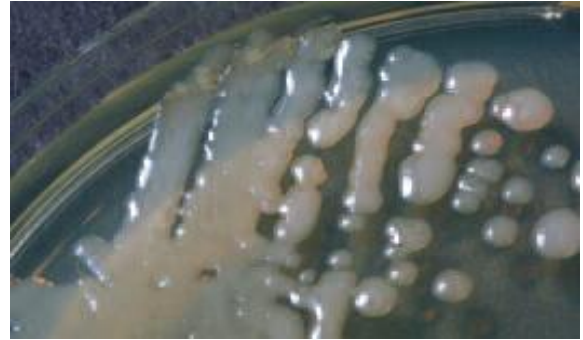
*ENTEROCOCCUS*: The colonies are white, circular, convex, smooth, and have an entire margin.



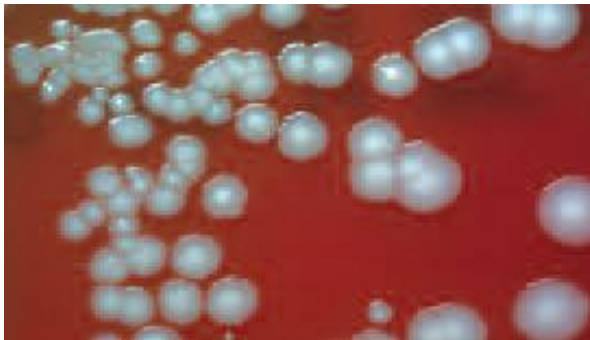
*B. mycoides* produces rapidly spreading, rhizoid colonies



*MICROCOCCUS LUTEUS*: These colonies are yellow, smooth, and convex with a regular margin.



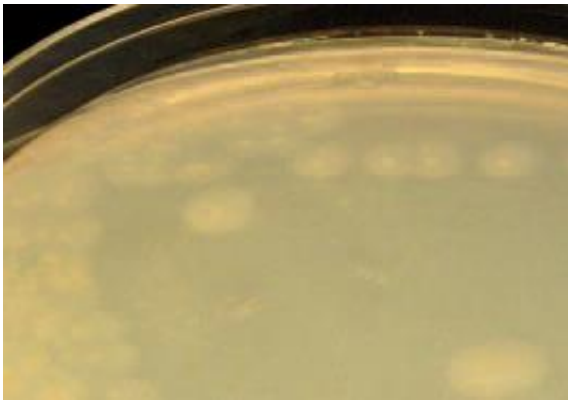
*KLEBSIELLA PNEUMONIAE*: colonies are mucoid, raised, and shiny.



*ALCALIGENES*: The colonies of this opportunistic pathogen are umbonate with an opaque center and a spreading edge.



*CITROBACTER* colonies are round, smooth, and opaque with a regular margin.



*ERWINIA*: These colonies are whitish, translucent, spreading, and umbonate.

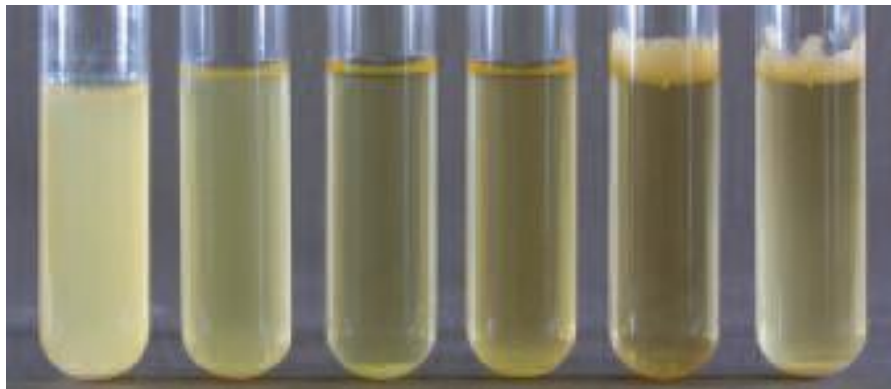


*RHIZOBIUM*: The colonies are convex, circular, and filamentous. They are translucent at the edges.

## 2. Growth Patterns on Broth

Bacterial genera—and frequently different species within a genus—demonstrate characteristic growth patterns in broth that provide useful information when attempting to identify an organism.

Microorganisms cultivated in broth display a variety of growth characteristics. Some organisms float on top of the medium and produce a type of surface membrane called a **pellicle**; others sink to the bottom as **sediment**. Some bacteria produce **uniform fine turbidity** while others appear to clump in what is called **flocculent** growth .



**GROWTH PATTERNS IN BROTH** ; From left to right in pairs (by type of organism): *Enterobacter aerogenes* and *Citrobacter diversus*—motile members of *Enterobacteriaceae* (uniform fine turbidity), *Enterococcus faecalis* and *Staphylococcus aureus*—non motile Gram positive cocci (sediment), *Mycobacterium phlei* and *Mycobacterium smegmatis* (relatives of *Mycobacterium tuberculosis*)—nonmotile with a waxy cell wall (pellicle).

### **FLOCCULENCE IN BROTH**

This is a *Streptococcus* species from a throat culture demonstrating flocculence in Broth.

