**Bacterial Cultural Characteristics or Morphology**

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, 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.

**In a liquid media:**

**(turbidity):** bacteria grow diffusely causing a uniform clouding of the media whereas others look granular.

**(pellicle):** Layering of growth or accumulation of cells padlike growth on the surface

**(sediment):** concentration of growth at the bottom of the broth culture may be granular.

**(flocculent):** Sometimes bacterial aggregations are formed and

the bacterial growth appears as small puff balls floating in the broth .

**(Ring formation) :** a ring of growth on the surface

Observation of such factors also helps in recognizing types of bacteria.



**The basic categories of bacterial colony appearance, forms and characteristics on solid media include**: colony form (shape), margin (edge), elevation, pigmentation (color),texture, and pattern of growth.

**1. Size** – pinpoint, small, moderate, large

**2. Pigmentation** – color of colony

**3. Optical properties**

a. opaque

b. translucent (clear)

c. shiny

d. dull

**4. Form –** the shape of the colony

a. circular – unbroken, peripheral edge

b. irregular – indented, peripheral edge

c. rhizoid – root-like, spreading growth

d. punctiform - tiny

e. filamentous

f. spindle

**5. Margin –** the appearance of the outer edge of the colony

a. entire – sharply defined, even, 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

**6. Elevation –** the degree to 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



**Growth on Slants**

**1. Abundance of growth** - the amount of growth is designated as none, slight, moderate, or large

**2. Pigmentation** – chromogenic bacteria may produce intracellular pigments that are responsible for the color of the colonies on the agar surface. Other bacteria

produce extracellular soluble pigments that are excreted into the medium and that also produce a color. Most microorganisms are nonchromogenic and will appear cream, white, or gray.

**3. Optical characteristics** - these characteristics are based on the amount of light transmitted through the growth: opaque (no light transmitted), translucent (partial

transmission), or transparent (full transmission).

**4. Form –** the appearance of the single line streak of growth on the agar slant.

a. filiform – continuous, threadlike growth with smooth edges

b. echinulate – continuous threadlike growth with irregular edges

c. beaded – nonconfluent to semi-confluent colonies

d. effuse – thin, spreading growth

e. arborescent – treelike growth

f. rhizoid – rootlike growth

