

CM Colony Morphology

Learning Objectives

The student will

- Follow oral and written instructions and manage time in the lab efficiently.
- Apply correct terminology regarding microbial growth, when making observations.

Background/Theory

On agar plates, bacteria grow in collections of cells called colonies. Each colony arises from a single bacterium or a few bacteria (CFU). Although individual cells are too small to be viewed with the unaided eye, masses of cells can be observed. Colonies can have different forms, margins, elevations and colors. Observing colony characteristics is one piece of information that microbiologists can use to identify unknown bacteria. (Petersen, 2016)

In this exercise you will be drawing colonies and describing each type's size, shape, elevation, margin, color and texture. Keep in mind that the colony characteristics of a microbe may change depending on the medium, time and temperature of incubation. The medium supplies the nutrients and other materials for the cell to use. Along with the size of individual cells, the colony size depends on the speed at which the cells divide. This is determined by the organism's inherent cell cycle, the availability of nutrients and the organism's optimal growth temperature.

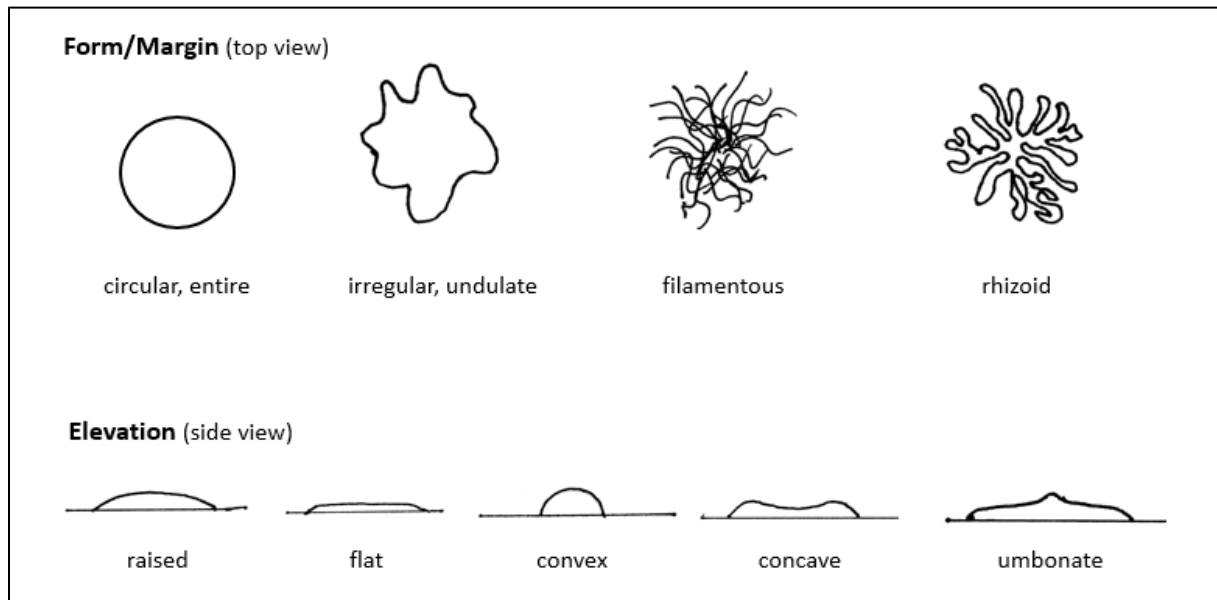


Figure 1 Colony Forms

Size can be actually measured in millimeters or described as "pin point."

Colony **form** means the shape and can be circular, irregular, or rhizoid (branched). This is the cumulative (macroscopic) effect of the microscopic cellular shape and arrangement.

Elevation refers to the cross sectional view or profile of the colony. It can be raised, flat, convex, concave or umbonate.

Margin describes the edge. A smooth edge is called entire. Other margins are undulate (an irregular, wavy edge), lobed (more pronounced wavy edge) or spreading (no distinct colonies). Filamentous and rhizoid may also be used to describe the margin.

Colony **color** can be the result of the color of the actual cell, the result of pigments produced by the cell under certain conditions, or the interaction of certain cellular metabolites with components in the medium.

Texture can be dry, ridged or wavy, mucoid/shiny, dull, filamentous (hairy looking).

Experiment/Exercise

Materials per student pair

Ruler

Cultures

Pure culture plates from exercise SI

Environmental sample from exercise SI

Procedure

1. Observe one colony from each of 3 different pure cultures produced in the SI Exercise. (Do not observe the *M. luteus S. epidermidis* mixed culture plate.) Include the following.
 - a. The full organism name written in full scientific form.
 - b. A sketch of the top view and the side view. For the side view, draw a straight line to represent the agar surface as in figure 1 above.
 - c. Use relevant terms to describe the size (measure, if .5 mm or larger), color, form, elevation and texture of each.
2. You may observe your partner's plate or another pair's plate.
3. Observe two different colonies from an environmental plate. Instead of the organism name, write in the sample source. Be more specific than "environmental sample." Instead put in "restroom sink sample," for example. Use the same characteristics as you used for the pure cultures. You may observe another student's plate if you do not have two different looking colonies on your environmental plate.
4. When you are finished observing your plates, do not dispose of them right away. You will be using them in the SSt exercise.
5. When finished with all the exercises for this week, dispose of the plates in the correct container unless otherwise directed.

Lab Report: Colony Morphology

Name _____

Lab Section _____

Data and Observations

Organism (Be sure to use the correct format!)	Sketches (top and side views)	Size and color	Form, margin and elevation	Texture

Post Lab Questions

1. What microscopic cell shape(s) might produce a convex colony?
2. What microscopic cell shape(s) might produce filamentous colonies?

CM

References

Petersen, J. a. (2016). Laboratory Exercises in Microbiology: Discovering the Unseen World Through Hands-On Investigation. CUNY Academic Works. Retrieved from http://academicworks.cuny.edu/qb_oers/16