

Lecture 2

I. Describing bacteria

A. Colony Morphology

1. Colony morphology is used to describe the _____. Remember that a colony arises from a single cell so a colony represents a pure culture.

Colony morphology terms

When recording colony morphology, it is important to also record color, optical properties (translucence, sheen) and texture (moist, mucoid, dry). However, remember that color is often influenced by environment.

Shape:	Margin (edge):	Elevation:
Circular	Entire (smooth)	Flat
Irregular	Undulate (wavy)	Raised
Punctiform (tiny)	Rhizoid	Convex
	Lobate	Pulvinate
	Filamentous	Umbonate

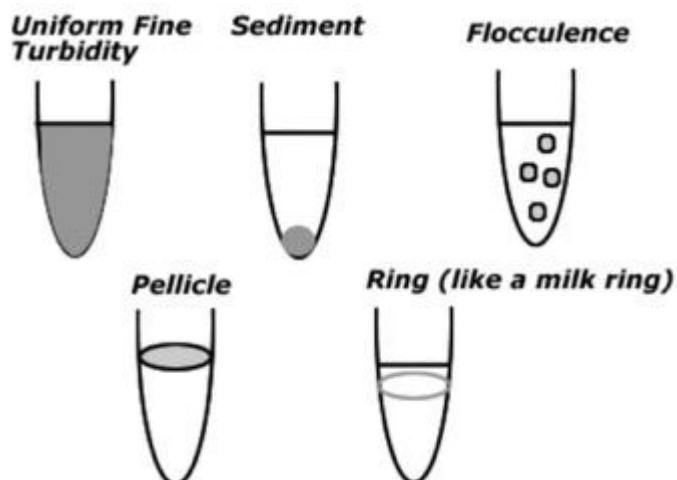
B. Turbidity and broth growth

1. Can be used to estimate the _____

Turbidity	Bacteria per mL
None	$0-10^6$
Light	10^7
Moderate	10^8
Heavy	10^9

Turbidity and bacteria count
Note: Bacterial populations grown in liquid medium usually do not exceed 3×10^9 bacteria/mL.

2. Some bacterial have distinctive growth patterns in broth.



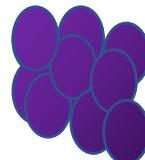
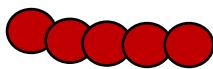
C. Bacterial Cell Shapes and Arrangement

1. Shape refers to the individual cell shape when viewed under a microscope

2. We will deal mainly with the two most common shapes: _____



Bacterial Cell Arrangements



Strepto- chain of cells

Diplo-

Tetrad-

Sarcina-

Staphylo- Irregular clusters of cells

II. Wet mounts

A. In the last lab we viewed samples (_____) under the microscope. This is a fast way to view _____ that is _____. We were able to make true assessments of _____. However, these wet mounts are _____ and can be a potential _____.

III. _____ samples (smear preparations)

A. Fixation

1. _____ fixation: simultaneously _____. This is the _____ fixation method.

2. _____ fixation: has the same results as the heat fixation. Often used when heat can damage cells structures you are trying to observe. Examples of chemical fixatives are alcohol and formaldehyde.

B. Disadvantages of a fixed sample

1. Can't observe specimen _____

2. Causes a slight _____

C. Advantages of a fixed sample

1. _____ - can be used for long-term study.

2. The preparations _____ (below) to enhance contrast and reveal specialized cell structures (e.g. flagella, endospores, capsules, cell walls etc..)

IV. Staining

A. The composition of a stain

1. Solvent

2. A solute contains

_____ which are highly conjugated and give the dye its _____.
i. _____

_____ dyes

a. Contain _____ charged groups, which bind to _____

b. Direct dyes are the _____

_____ and examples include methylene blue, basic fuchsin, crystal violet, safranin and malachite green.
c. Applied to bacterial smears that have been _____.

ii. _____ dyes
a. Possess _____ such as carboxyls (-COO-) and hydroxyls (-OH-).

Can be used to determine morphology and cellular arrangement in bacteria that are _____ to withstand heat-fixing.

A. Staining categories

1. _____ (today)

i. Uses a _____ (acidic or basic) and all organisms stain the _____.
ii. Is a _____ method to determine cell size, shape and arrangement.

2. _____

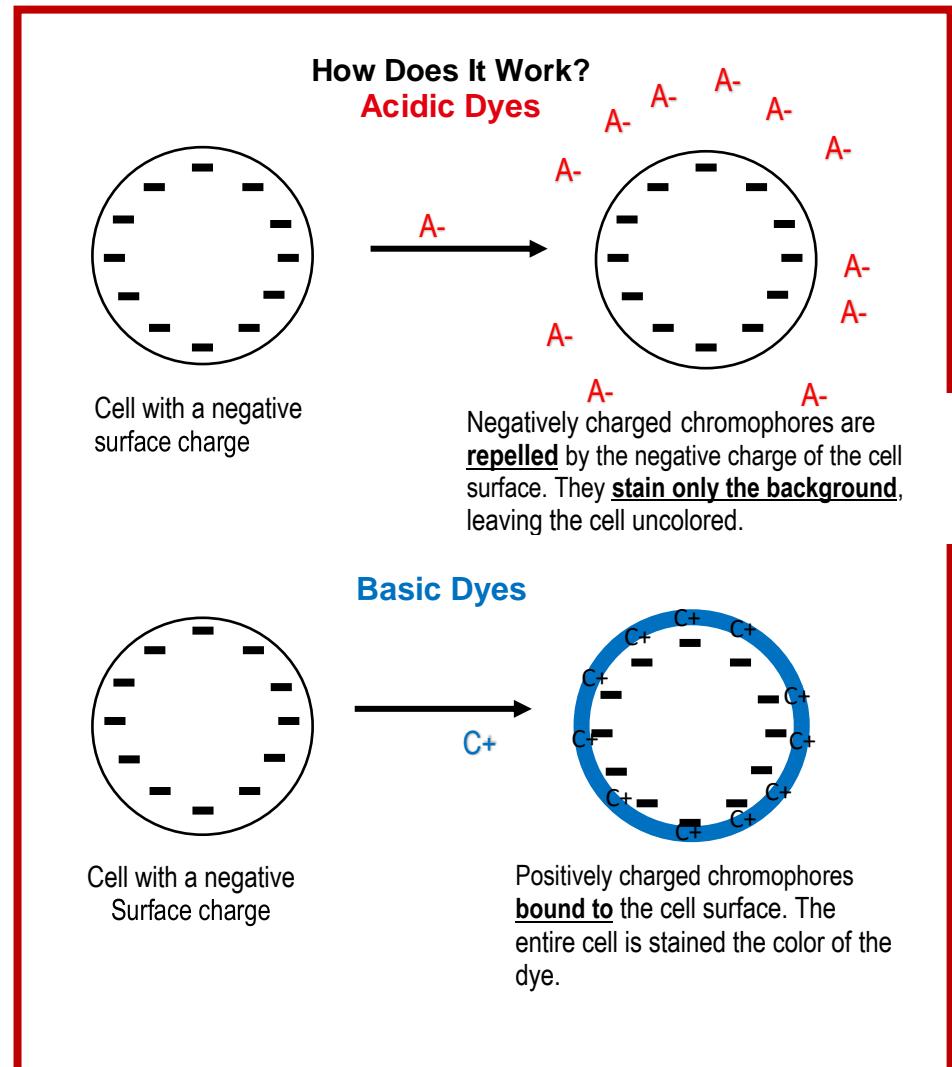
i. Divides bacteria into _____ based on staining properties.
ii. Is _____ but the color of staining gives information _____ in addition to size, shape and arrangement.

V. Some processes used in the identification of bacterial unknowns:

A. _____ (staining)

B. _____ (e.g. type of colony and time it takes to grow) and _____ (e.g. carbohydrate fermentation and production of virulence factors)

C. Results can be coupled with a _____.



New tools you will encounter in this lab course:

