

Name the organism that grows best at higher than normal CO₂ concentrations.

Capnophiles

What is the normal pH range for microbial growth?

6-8

B) Alkaliphiles

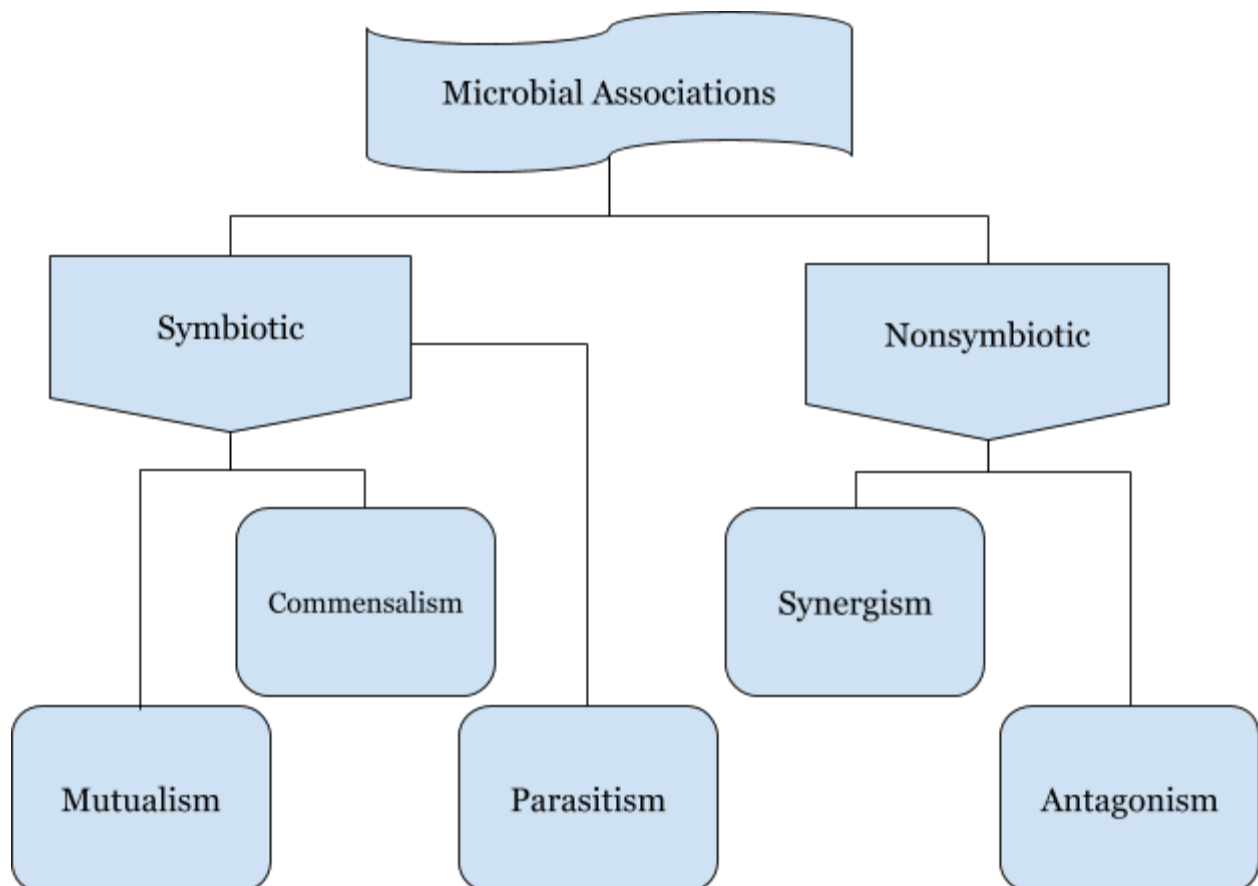
A) grow at extreme low pH

A) Acidophiles

B) grow at extreme high pH

Halophiles require a high salt concentration (hypertonic solution).

Barophiles can survive under extreme pressure, and will rupture if exposed to normal atmospheric pressure.



Explain binary fission.

Cell enlarges → replicates chromosomes → forms central transverse septum → divides into two daughter cells

What is a “generation” (aka doubling time)?

The time it takes for one complete fission cycle

Write the equation for calculating population size over time.

$$(\text{starting number}) \times 2^n = \text{total number}$$

If generation 1 had 6 cells, how many cells will generation 4 have?

96 cells

List the stages of the normal population growth curve.

1. Lag phase
2. Exponential growth phase
3. Stationary phase
4. Death phase

What are the methods of analyzing population growth?

- Turbidimetry
- Viable colony count
- Direct cell count
- Automated coulter counter

The 5 I's of culturing microbes are:

1. Inoculation
2. Incubation
3. Isolation
4. Inspection
5. Identification

Break down the types of media used based on:

- Physical states
 - Liquid → water-based solution that contains nutrients (a broth... doesn't solidify)
 - Semisolid → contains enough solidifying agent to thicken, but doesn't “firm up”
 - Solid → contains solidifying agent for firm surface for colony formation
- Chemical contents
 - Defined (synthetic) → contains pure organic & inorganic compounds in exact chemical formula
 - Complex (nonsynthetic) → contains at least one ingredient not chemically definable

- Functional types
 - General purpose → grows broad range of microbes that don't have special growth requirements
 - Enriched → contains complex organic substances required by fastidious microbes
 - Selective → contains one or more agents that inhibit growth of some microbes and encourage growth of desired microbe
 - Differential → allows growth of several types of microbes (displays visible differences among them)
 - Reducing → contains chemicals that absorb oxygen (used for growing anaerobic bacteria)
 - Carbohydrate fermentation → contains sugars that can be fermented and a pH indicator to show reaction
 - Assay → tests the effectiveness of antimicrobial drugs, disinfectants, etc.