

Biology Key Terms

Diversity of Life: Bacteria & Viruses

microbes - things that are too small to be seen with the naked eye, including viruses and bacteria; many are also called germs or pathogens

pathogen - disease-causing agent (virus, bacterium, protist, fungus)

bacteria (sing. bacterium) - one of two Domains of prokaryotes; single-celled organisms that lack nuclei

virus (pl. viruses) - infectious agent composed of a core of DNA or RNA surrounded by a protein coat

host - the organism that houses a disease-causing entity (bacteria, virus); the disease-causing entity would reproduce within the host (example: you may be the host for *E. coli* if you have a stomach flu)

viroid - plant pathogens; their genome is composed of very short, circular RNA

prion - an infectious particle made of protein (rather than DNA or RNA) that has been mis-folded; it may induce other proteins to fold in a similar manner to itself

BACTERIA

prokaryote - single-celled microorganisms that lack a nucleus; all bacteria

Archaeobacteria - ancient forms of bacteria that survive extreme heat, acidity, or salinity or even methane

Eubacteria - slightly more advanced bacteria found in three common shapes: bacilli, cocci, and spirilla; range from mutualistic and beneficial forms to extremely deadly parasitic forms

peptidoglycan - a polymer of sugars and amino acids, which protects the cell from injury and determines its shape.

capsule - outer layer of some bacteria that protect bacteria from drying out and being eaten

pili (singular: pilus) - hairlike projection often used in bacterial conjugation; one type helps in motility

nucleoid - bacterial genome (DNA)

plasmid - tiny circular piece of DNA (separate from the bacterial genome) found in bacteria that typically contains antibiotic resistance genes or other genes beneficial to the bacteria.

flagellum - a whip-like structure that some prokaryotes (and eukaryotes) use for locomotion

cocci (singular: coccus) - sphere-shaped bacterium

bacilli (singular: bacillus) - rod-shaped bacterium

spirilli (singular: spirillum) - spiral/helical shaped bacterium

filamentous - elongated shape for a bacterium

gram stain - technique for identifying eubacteria based on their cell wall structure; it involves dyeing and rinsing the cells

gram positive - bacteria with thick peptidoglycan layer that remain violet colored after gram staining

gram negative - bacteria with thin peptidoglycan layer that remain red/pink colored after gram staining

photoautotroph - organism that obtains energy directly from the sun

chemoautotroph - organism that obtains energy directly from inorganic molecules

photoheterotroph - a bacteria that is able to photosynthesize, but also requires organic compounds for nutrition

taxes (singular: taxis) - movements toward or away from a stimulus (phototaxis, chemotaxis and magnetotaxis types exist in bacteria)

obligate aerobes - organisms that require a constant supply of oxygen to live.

obligate anaerobes - organisms that do not require oxygen to live. Can even be poisoned by it!

facultative anaerobes - organisms that do not require oxygen, but can switch between cellular respiration and fermentation. They can live anywhere!

binary fission - asexual cell division in bacteria that results in two identical daughter cells (this also occurs in some cell organelles such as mitochondria)

(bacterial) conjugation - when a bacterium transfers genetic material (such as a plasmid) to another bacterium by physical contact with another cell. It usually involves direct cell to cell contact and/or a bridge between cells.

endospore - tough, protective form of bacteria that is usually triggered by low-nutrient conditions. It allows the bacteria to remain dormant for until favorable conditions for growth arise.

pasteurization - a process of heating and cooling food products repeatedly so that the endospores which break out of dormancy into regular bacterial form during cooling will be killed if heated again.

sterilization - any effective means of removing or killing pathogens; it may involve using heat, chemicals, irradiation, pressure

antibiotic - compound that kills or stops the growth and reproduction of bacteria

zones of inhibition (ZOI) - in bacterial culture, an area where bacteria are not growing because a chemical agent (antibiotic, for example) is inhibiting their growth

bioremediation - a process where bacteria are used to clean up waste water, oil spills, or convert garbage to compost.

nitrogen fixation - the process of converting nitrogen gas into a chemical form that plants can use

VIRUSES

capsid - the outer boundary of a virus, composed of protein

retrovirus - virus that stores its genetic information as RNA

bacteriophage - virus that infects bacteria

lytic (lytic cycle) - type of viral reproduction or infection in which the viral cell releases its DNA into the host cell and the host cell makes new viruses by reading viral DNA. The host cell bursts releasing the manufactured viruses. Viruses that use the lytic cycle are called virulent.

lysis - process of breaking apart or bursting a cell

lysogenic (lysogenic cycle) - type of viral reproduction or infection in which the host cell integrates copies of the viral DNA within its own genome and the viral DNA is copied into daughter cells as part of normal bacterial reproduction. The host cell does not lyse. Viruses that use the lysogenic cycle are called temperate because they do not immediately cause disease.

interferon - a protein produced by cells when exposed to a virus. This protein binds to the cell membranes of neighboring cells and "interferes" with the ability of a virus to enter the cell.

vaccine - part of a virus (or bacterium) that has been permanently damaged or *attenuated* (weakened) used to prevent infection by exposing a host to it; its role

is to stimulate the body's immune system so that it destroys and then records information about the invader, should it return again.