

Bacteria

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BACTERIA Period: 4 Characteristics: 3 major shapes Cocci Basilli Spirilla 3 major components Mesosomes flagella Plasmids Growing Up: Bacteria can obtain energy through phototrophs(sunlight), lithotrophs(inorganic compounds), and organotrophs(organic compounds) Marriage/Reproduction Binary Fission: The process by which all bacteria reproduce. It results in the separation of a single cell into two. Transformation: genetic alteration of a cell resulting from the direct uptake, incorporation and expression of exogenous genetic material (exogenous DNA) from its surroundings and taken up through the cell membrane(s). Transformation occurs naturally in some species of bacteria, but it can also be affected by artificial means in other cells. Conjugation: The process whereby two ciliates come together in a temporary fusion to exchange micro nuclear material, then separate, each being a fertilized cell. Explain how the F plasmid controls conjugation in bacteria. In bacterial conjugation the host bacterium attaches to another bacterium via pili. The plasmid region contains its own origin of replication in other words it can replicate independently from the DNA that is in the cytoplasm. This DNA tends to code for virulence factors. When the pili has attached to the recipient cell then DNA replication of the F-plasmid occurs and it is transferred over to the recipient cell making the recipient cell now an F+ cell. However, these cells can't perform this process with other F- cells because this type of cell lacks the pili to perform conjugation. Explain how bacterial conjugation differs from sexual reproduction in eukaryotic organisms. In bacterial conjugation, a bacterium forms a sex pilus and uses that to inject a copy of a plasmid into another bacterium. The recipient cell isn't " haploid" for the genes on this plasmid. It may or may not already have

copies of the plasmid. It doesn't become "fertilized." The target bacterium gains the genetic contribution -- unlike in eukaryotes, where only the new developing organism (not the mother) gains the "paternal" genetic contribution. The Family Tree Streptococcus Pyogenes- Streptococcus pyogenes is transmitted from human to human, either by a known or unknown carrier. This bacteria can also be transmitted by infected water, food, soil, and animals, although human to human infection is most common. The infection can enter the system through the respiratory system or breaks in the skin. Streptococcus pyogenes is also responsible for the devastating necrotizing fasciitis. Escherichia coli- (STEC) occurs when people contaminated foods or liquids. The U. S. Department of Agriculture Food Safety and Inspection Service recall site lists food products contained with harmful E. coli. The most common contaminated foods and liquids that have caused E. coli outbreaks include: 1) Undercooked or raw hamburgers 2) Salami 3) Produce such as spinach, lettuce, sprouted seeds 4) Unpasteurized milk, apple juice, and apple cider 5) Contaminated well water or surface water frequented by animals STEC can also occur by 1) Failure to wash your hands thoroughly with soap and water following contact with an infected animal or animal waste. This can occur at farms, petting zoos, fairs, or even in your own backyard. 2) Failure to wash your hands thoroughly with soap and water following contact with an infected person. 3) Swallowing unchlorinated or underchlorinated water in swimming pools contaminated by human feces. 4) Swimming in water with even very low levels of sewage contamination. 5) Consuming contaminated food, water, or ice. Difference between Eubacteria and Archaeobacteria. Improve this chart | Archaeobacteria

| Eubacteria | Cell Membrane: | Branched chain ether linked lipids. | Straight chain ester linked lipids. | tRNA: | Lacks thymine in tRNA. | Thymine present in tRNA. | RNA polymerase: | Ten subunit RNA polymerase core. | 4 subunit RNA polymerase core. | Role in ecology: | Role in bio-geochemical cycles is unexplored. | Vital in nutrient recycling. | Interactions with other organisms: | Mutualism, commensal. | Predators, mutualists, pathogens. | Pathogenicity: | None are pathogenic. | Some are pathogenic. | Significance in technology and industry: | Thermostable enzymes, sewage treatment, antibiotics, organic solvents, production of biogas. | Fermented foods, bioremediation, waste processing, agrichemicals, biological pest control, scientific research. | DNA: | DNA is closer to eukaryotes (sent on to daughter cells via mitosis) | DNA differs from eukaryotes. | Definition: | Single celled organisms without any cell organelles or nucleus. | All true bacteria or group of unicellular prokaryotic microorganisms. | Morphology: | Occur in various shapes like spheres, rods, plates and spirals. | Various shaped bacteria have been identified like rods, cocci, spirals, comma shaped, tightly coiled etc. | Cell Wall: | Lacks peptidoglycan. | Peptidoglycan is present. | Extremophilic: | Yes. | Some. |