

Infectious Diseases Unit Notes

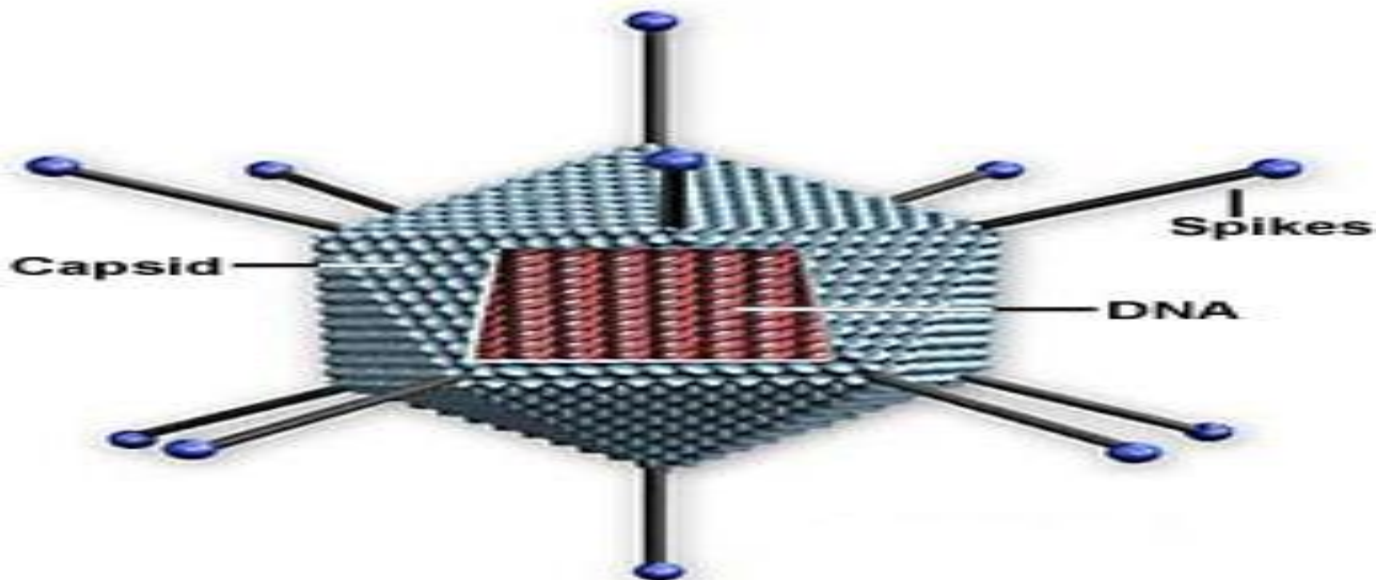
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DO NOT LOSE!

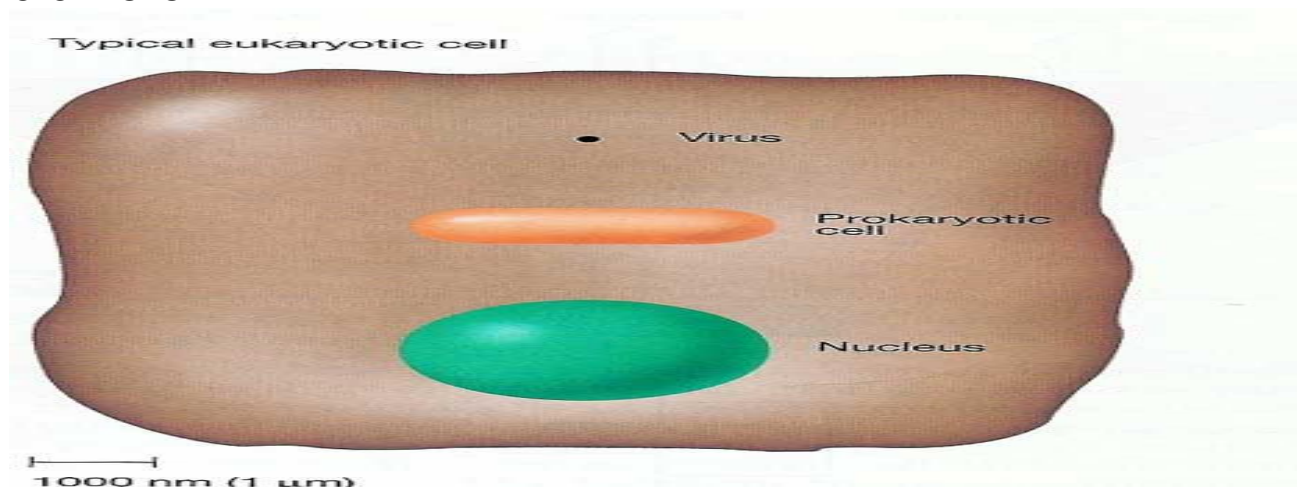
- Infectious Diseases will include
 - Viruses
 - Bacteria
 - Parasites

- A virus a nucleic acid (DNA or RNA) enclosed in a protein shell or coat (Capsid)

Animal Virus Structure



Viruses are extremely small, approximately 15 - 25 nanometers in diameter



- They can replicate only by invading and taking over other cells as they lack the cellular machinery for self reproduction.

Why Viruses are not living?

- Viruses are not made of cells.
- They have no cell parts.
- They do not grow and develop
- They do not respond to environment

Why Viruses are kind of living but not really.

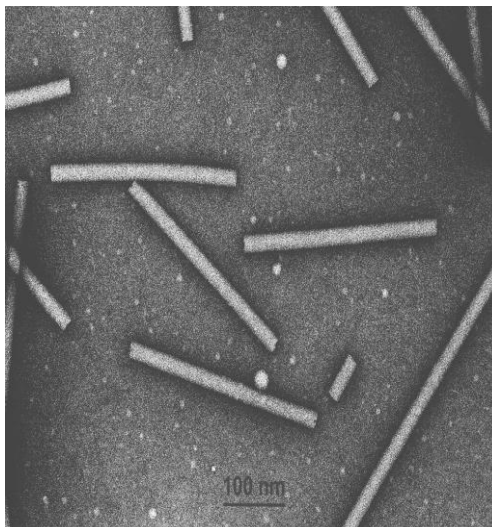
- Viruses replicate, but only by invading living cells, not by themselves
- They Evolve / Mutate
- Limited movement
- Viruses are not considered living by most scientists.

Types of Virus

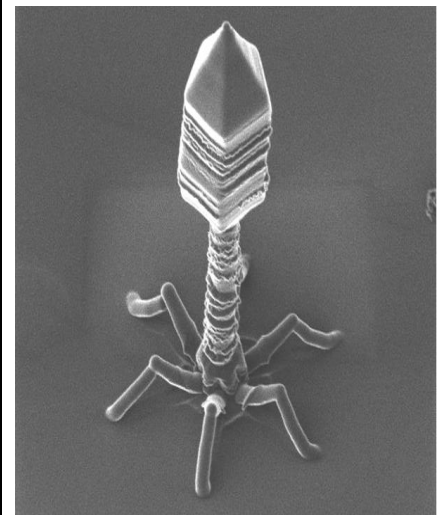
- Round



- Rod

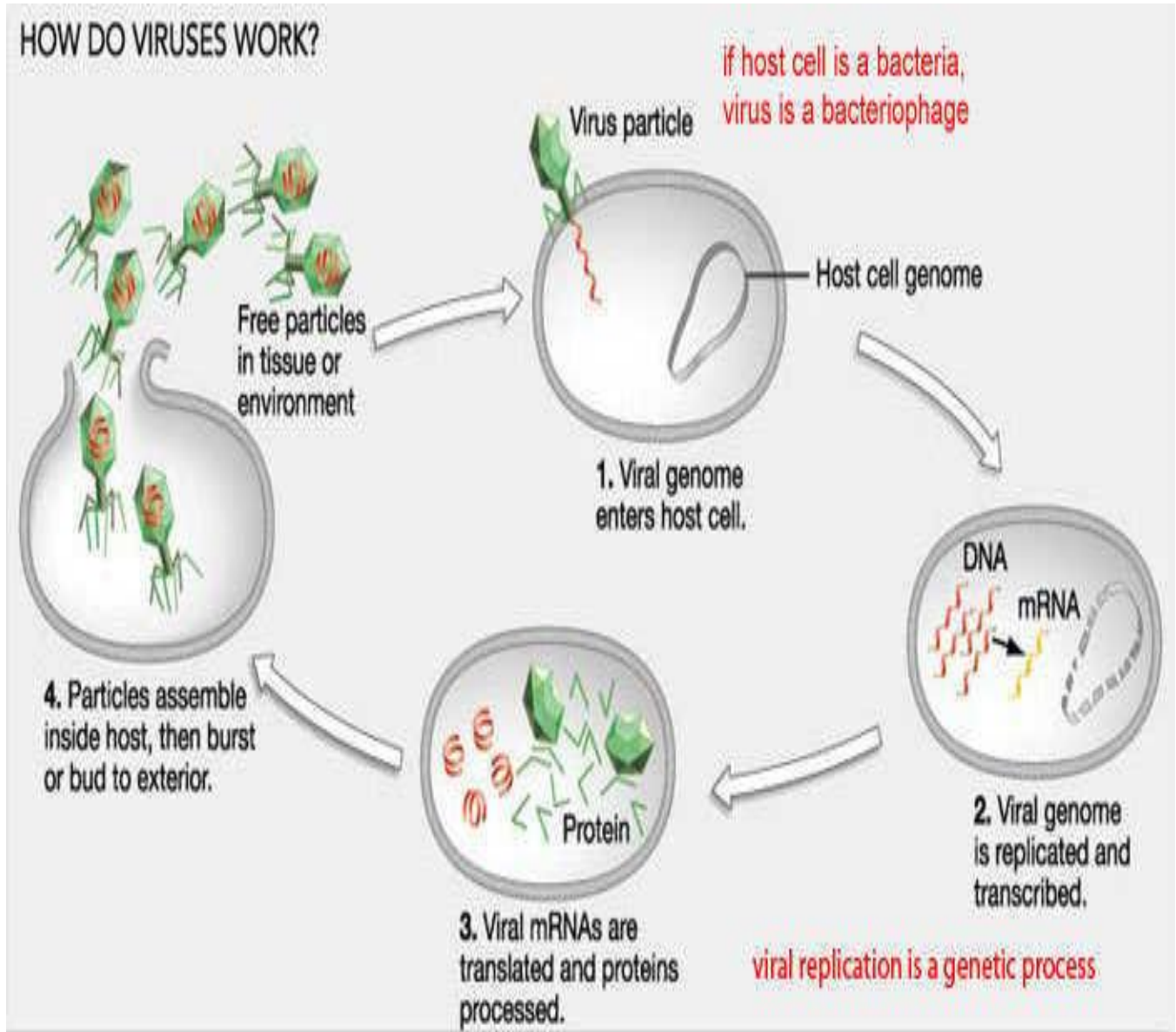


- Multi-sided



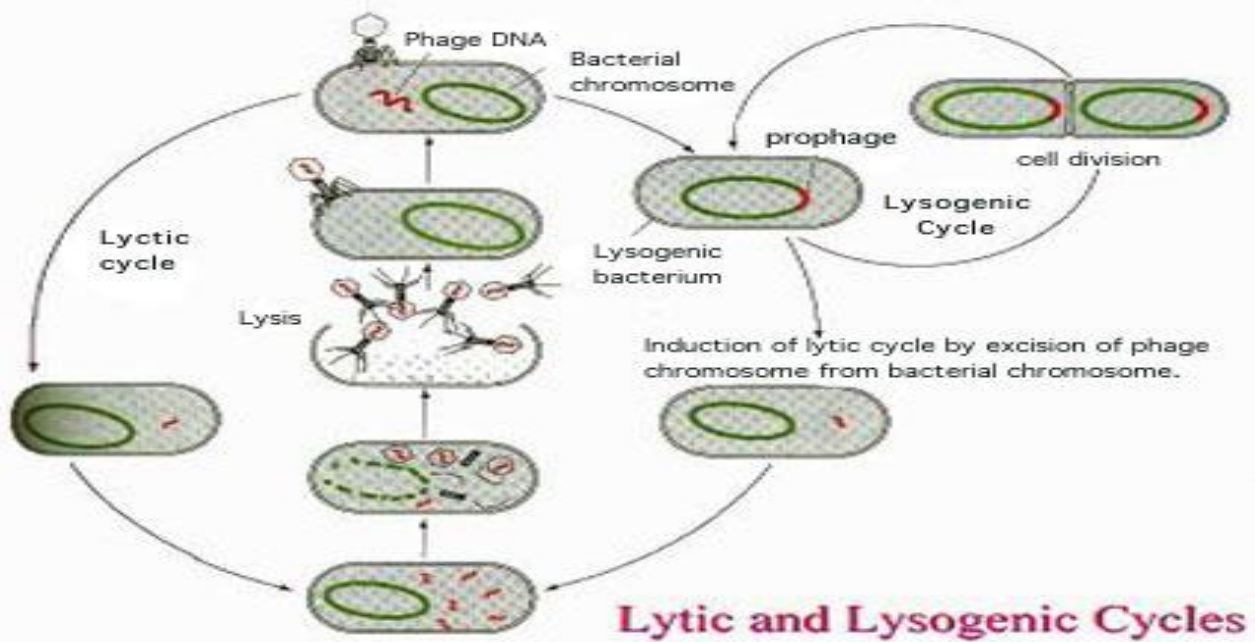
Lytic viruses – Causes host cell to split / die as virus replicates

Viral Replication

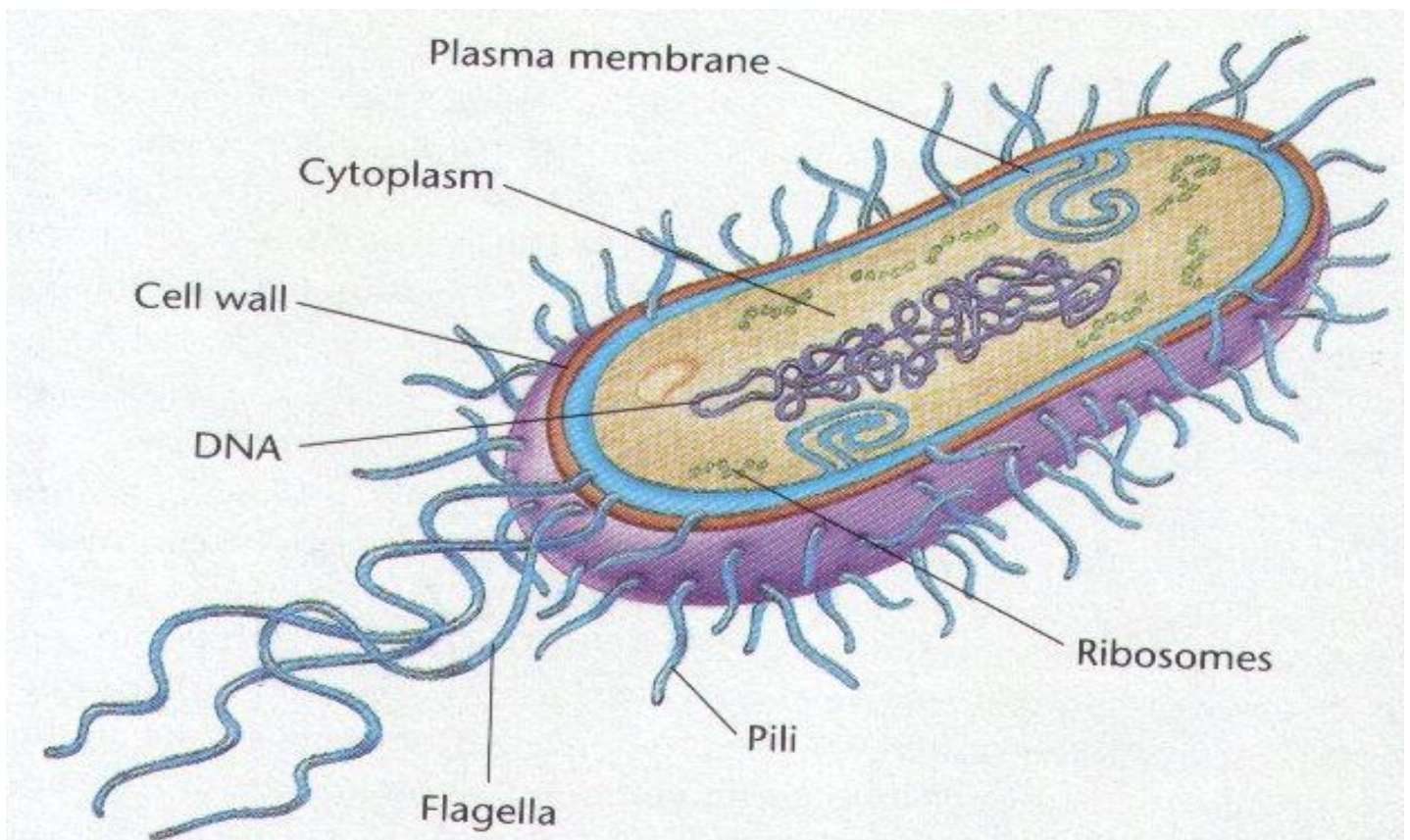


- Viral DNA/RNA infected into cell
- DNA/RNA replicates.
- New Virus are constructed.
- Viruses assemble.
- Viruses break free to find new host.

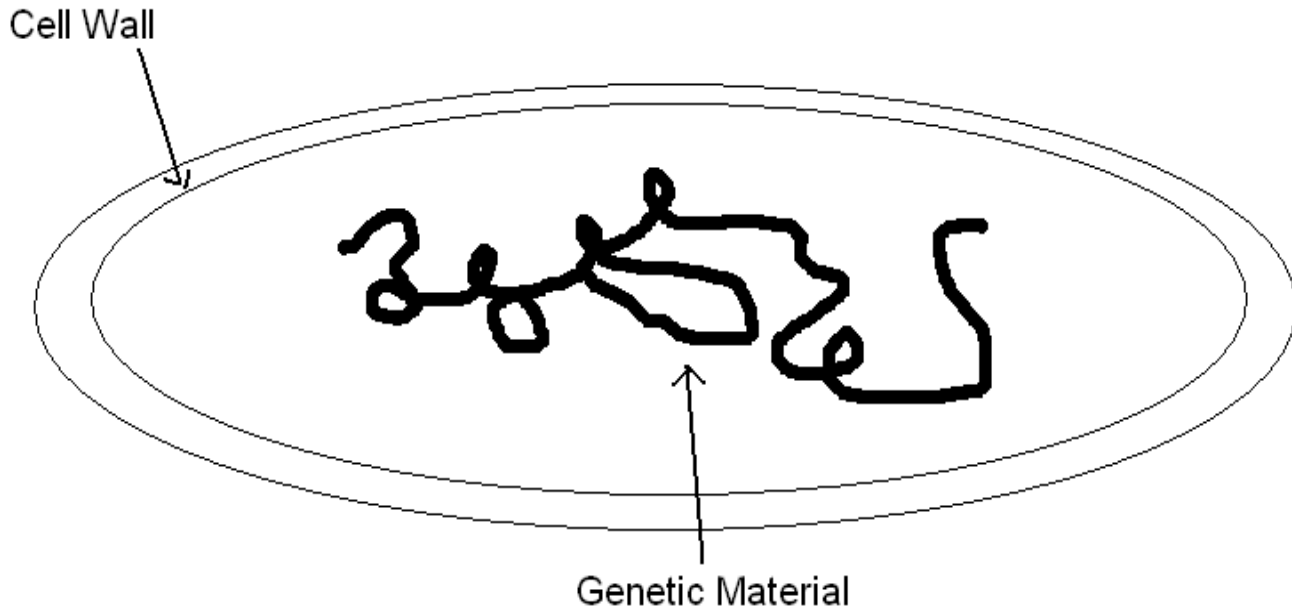
Lysogenic Virus – A virus that can hide inside your cells DNA until it breaks out and then hides again. With you forever.



● Area of focus: Bacteria

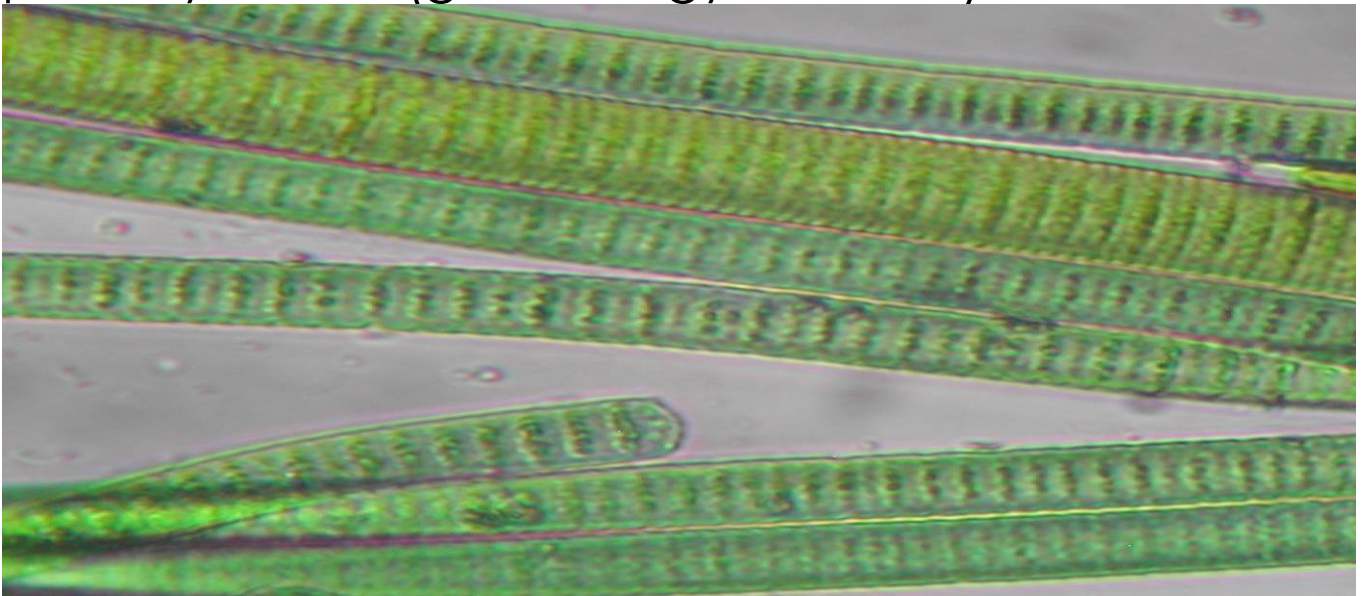


- Prokaryotic (No nucleus) and no internal organelles.



- Has a cell wall.
- DNA floats in cell
- Two types:
 - 1.) Archaea – old
 - 2.) Eubacteria – true
- Eubacteria – True bacteria, gets energy from food or sun.
- Sphere (Round) Shaped – Cocci .
- Rod shaped – Bacilli -
- Spiral shaped – Spirilla ~
- Mycoplasma bacteria – smallest known life form (jagged and random).

- Vibrio - Coma shaped ,
 - Diplo = Pair ..
 - Tetrad = Groups of four ::
 - Sarcinae = Groups of Eight. ::::
 - Staphylo = Cluster
 - Strepto = Chain -----
- Blue-Green Algae: Also called Cyanobacteria. It is photosynthetic (gets energy from sun).



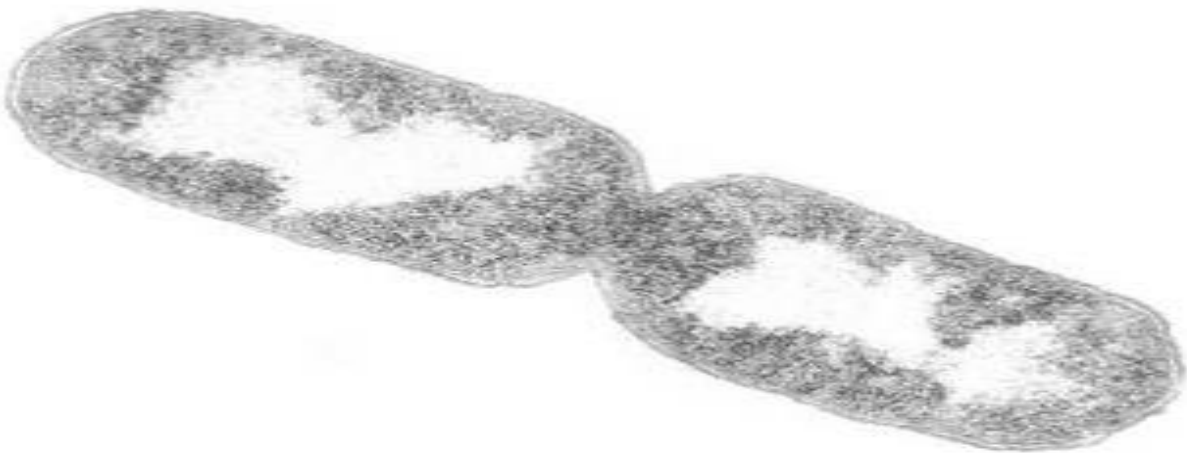
- Gram staining: Technique used to identify bacteria.
 - Pink and Red: Gram Negative -
 - Dark Purple: Gram Positive +
- Bacterial food borne illness can be prevented by....
 - -Controlling the initial number of bacteria present.
 - -Refrigeration – Prevents the small number of bacteria from growing rapidly.

- -Destroying the bacteria by proper cooking.
- -Avoiding re-contamination. Clean cutting board immediately after use.

- Penicillin: Antibiotic that destroys bacteria derived from penicillin mold (fungi).
- *Antiseptic* - agent that kills or inhibits the growth of microorganisms on the external surfaces of the body.

- Plaque is the accumulation of bacteria and microorganisms on a tooth.
- Tartar is dental plaque that has mineralized. Tartar can form when plaque is not removed from the tooth surfaces.

- Binary Fission: The process by which a bacterium multiplies by splitting in two.



- In asexual reproduction, one individual produces offspring that are genetically identical to it.

- Sexual Reproduction: Genetic material from two different individuals combines into a genetically unique offspring.

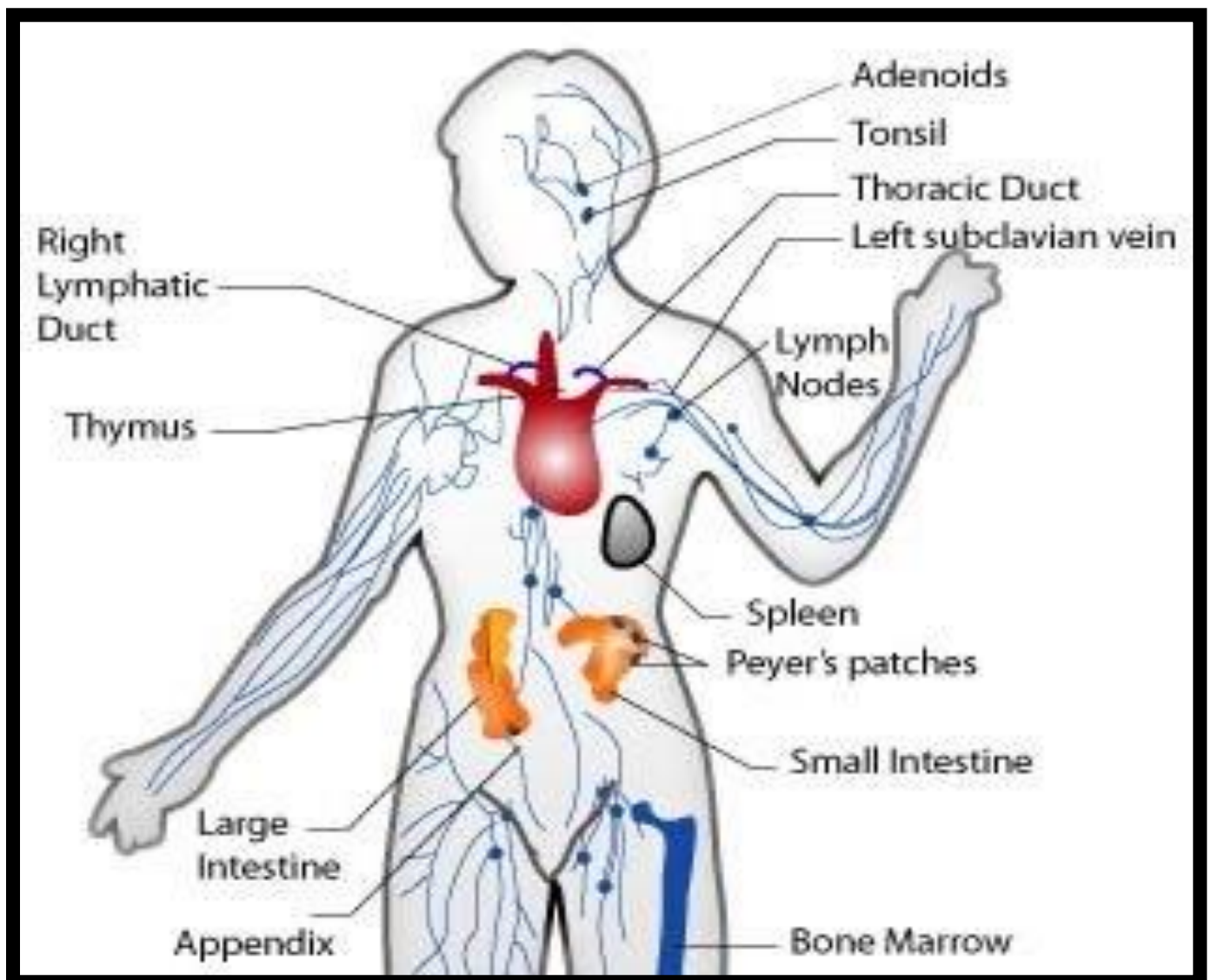
Positives (+)

- Food Source
- Recycling waste
- Industrial
- Decomposition

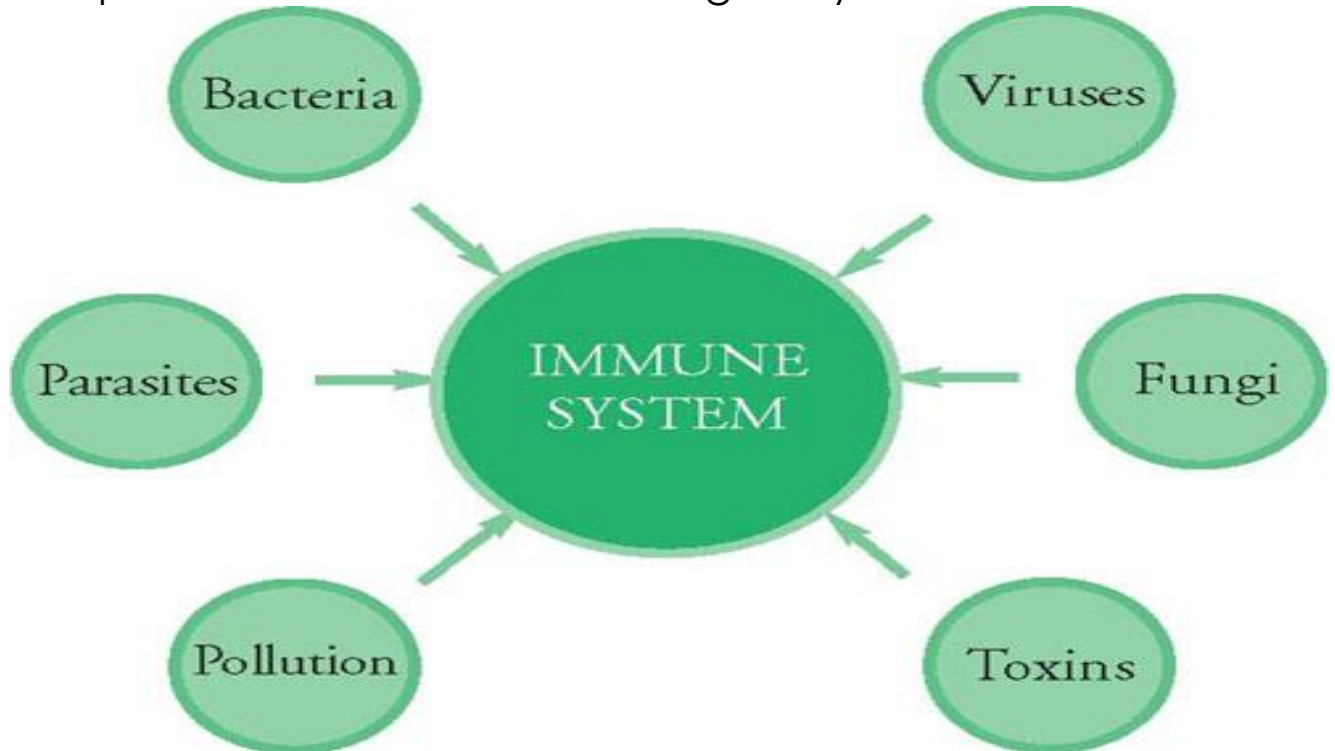
Negatives (-)

- Health Problems
- Destroys Food

- Immune system - A system that protects the body from diseases.



- Skin prevents disease from entering body



1st Line of Defense

- Skin prevents disease from entering body
- Interleukins – Tell body it's under attack

2nd Line of Defense

- The inflammatory response: Damaged cells release chemicals.
 - These chemicals cause blood vessels to leak fluid into the tissues, causing swelling.
 - This helps isolate the foreign substance from further contact with body tissues.

3rd Line of Defense

- Interleukins: These tell the body it's under attack.
 - These give you the aches and pains. "Time to rest!" (Warning System)
- Leukocytes: White blood cells (made in bone marrow)
 - - Phagocytes: Cells that engulf invaders.
 - - Lymphocytes: Cells that remember the invaders and help the body destroy them if they come back.
 - B-Cells

- T-Cells
- Dendritic Cells: These cells function to obtain antigen in tissues, they then migrate to lymphoid organs and activate T cells.
 - Antibodies cling to virus making it difficult to attach to cell.
- Immunity: Your immune system is now familiar with the invaders and can summon antibodies quickly.
- Vaccine: A suspension of weakened or dead pathogenic cells are injected in order to stimulate the production of antibodies and boost immunity.
- Virus prevention
 - Minimize contact with reservoir animal (birds, mice, etc.)
 - Minimize person to person contact

Diseases can be spread by...

- Insects
- Air
- Water
- Food
- Person to Person
- Animal to Person

Parasitism: One organism benefits while the other is harmed.

Endoparasite- Parasite that lives inside of you (worms, etc)

Ectoparasite – Parasite that lives outside of you (biting flies etc)

New Area of Focus: HIV/AIDS

- HIV=Human Immunodeficiency Virus
 - The virus attacks the cells of our immune system.
 - This makes the host susceptible to disease.

Please record the ways in which you can be infected with HIV as a class.

- Unprotected sexual intercourse with an infected person.
 - That is all types of sex, where bodily fluid is released for either gender.
- - *Contact with an infected person's blood*
- - *From mother to child (Breastmilk)*
- - Use of infected blood - Most blood banks are tested but always a risk
- - Injecting drugs (needles are often shared between users)

AIDS - Acquired Immune Deficiency Syndrome

The disease AIDS occurs when the immune system cells left in the body drop below a particular point.

STD's - The types of sexual activity that can transmit a disease are

- penetrative sex (vaginal, anal or oral)
- genital foreplay.

Some diseases are transmitted through -

- skin to skin contact
- Fluids such as sperm, blood or saliva
- some are passed from mother to baby

Review! Abstinence is best, (Means no contact!) if you can't abstain, than use a condom. Condom use doesn't prevent the skin to skin STD's, and only helps against the others.

