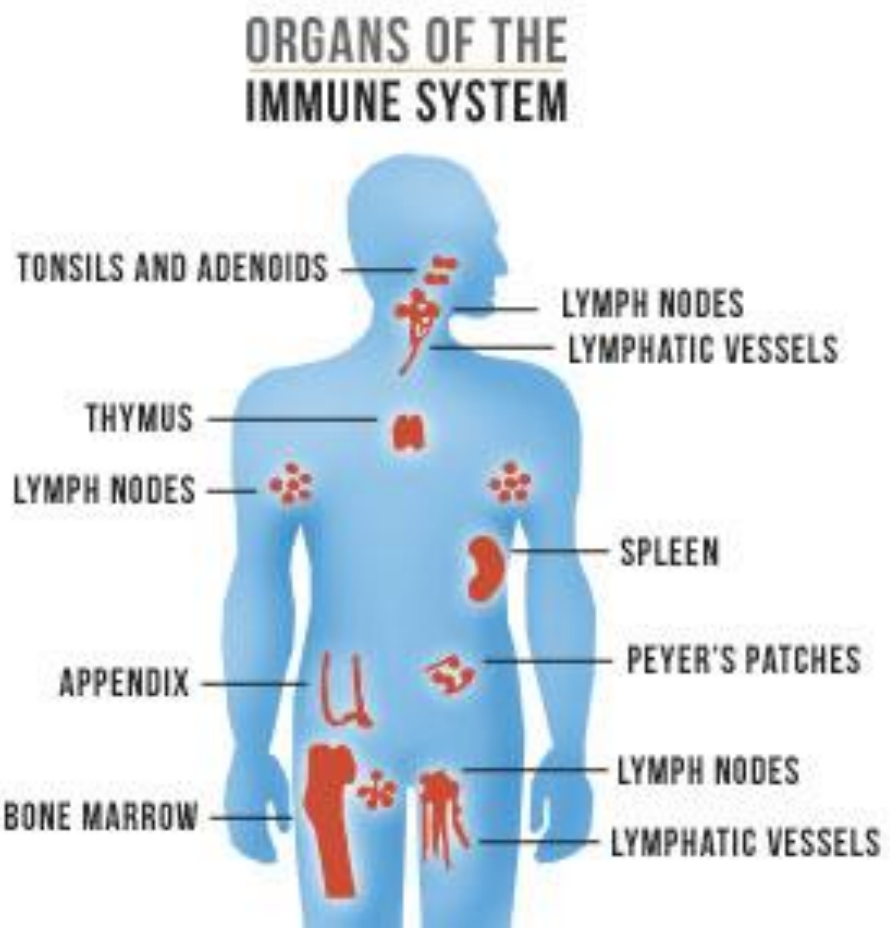
THE IMMUNE SYSTEM

<u>Function(job)</u>: to protect the body from pathogens (things that cause diseases) using special immune cells.

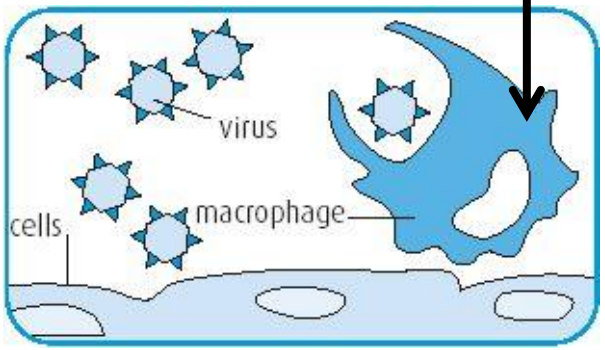
- **The Immune System includes:**
  - Spleen
  - Thymus
  - Lymph nodes
  - White blood cells

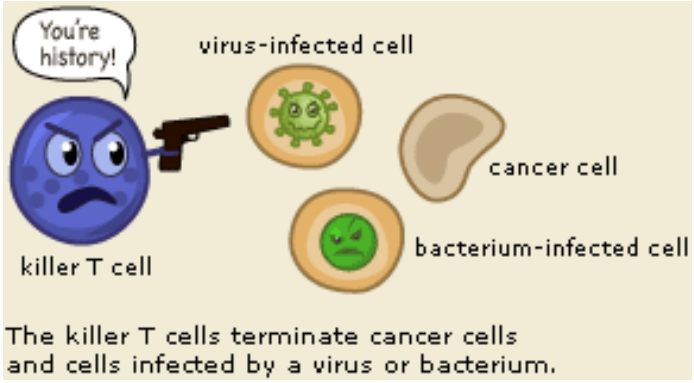


THE IMMUNE SYSTEM

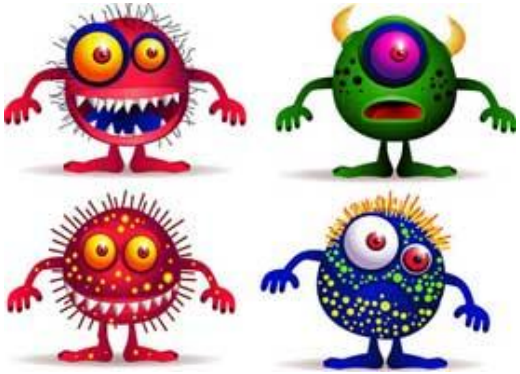
- Spleen, thymus and lymph nodes help ***make*** and ***store*** special cells called white blood cells
- White blood cells <u>help attack pathogens that get into the body</u>.
  - **Macrophages**: kill pathogens by eating them (using *endocytosis – cell eating*).
  - **T cells**: help kill pathogens using poison.

Macrophage ("eater" white blood cell)



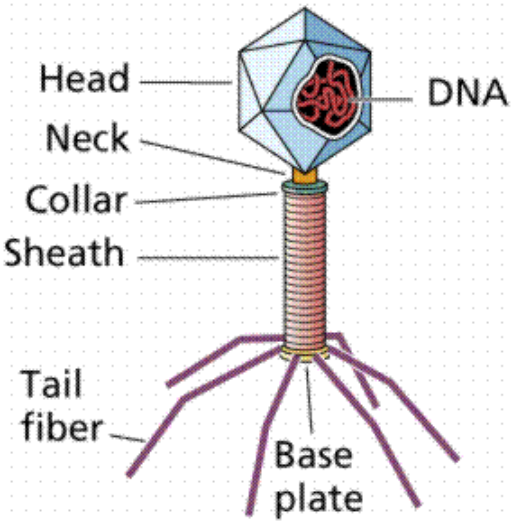


PATHOGENS

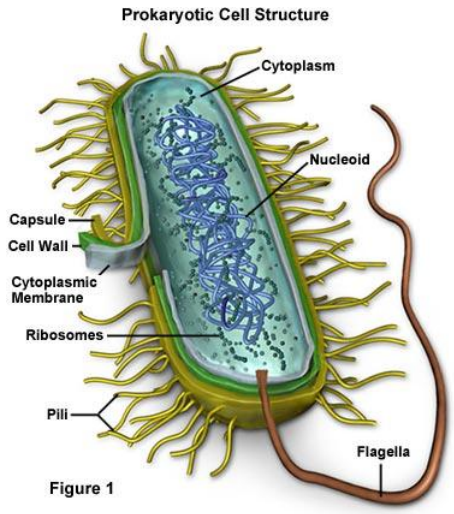


- things that cause disease:
  - bacteria (like food poisoning),
  - **viruses** (like the cold virus or HIV),
  - fungi (like toe nail fungus)
  - other tiny microscopic organisms.

Virus

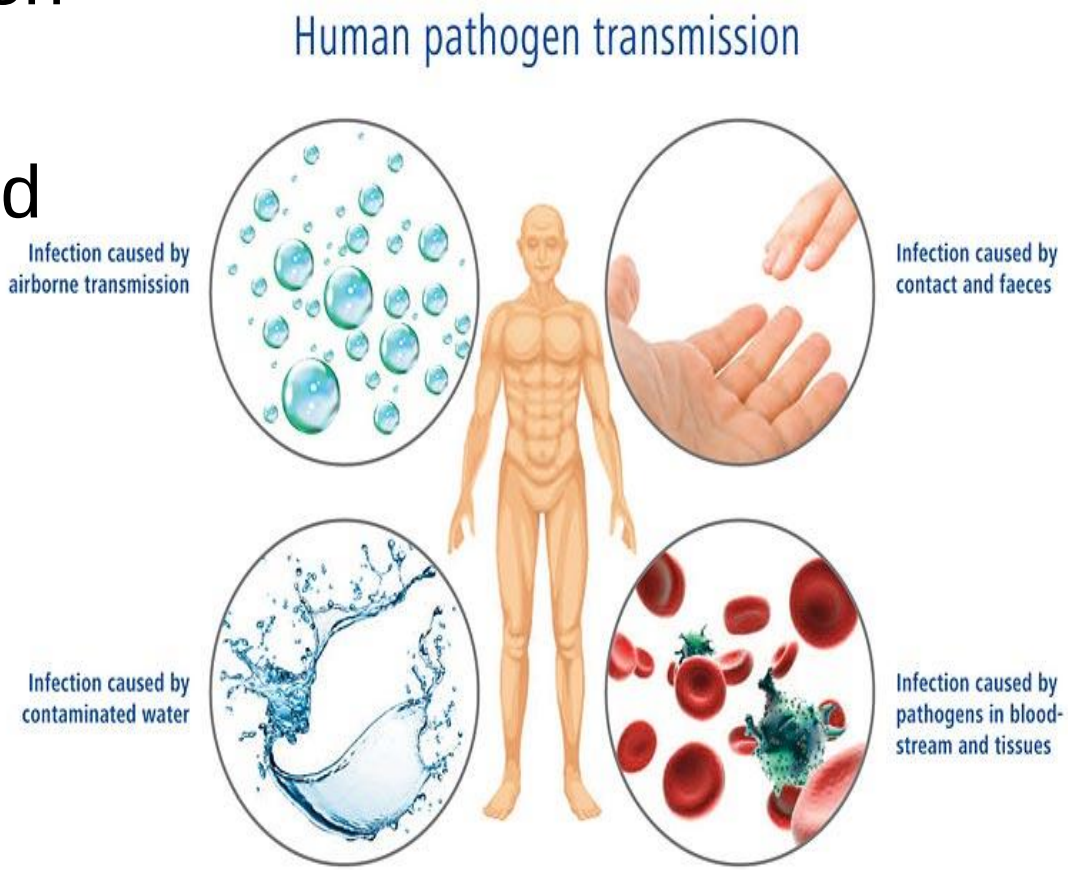


Bacteria



HOW YOU GET SICK

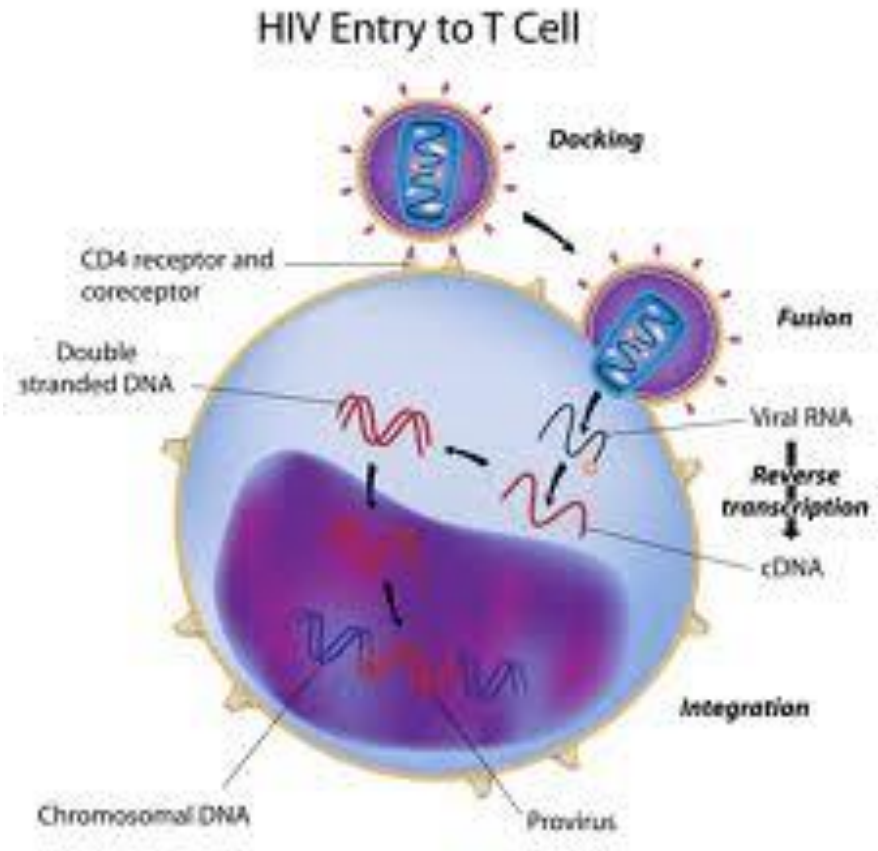
- You can get a pathogen by:
  - drinking or eating food or water that has the pathogen in it
  - breathing air with a pathogen in it
  - touching a pathogen
  - getting the pathogen into your blood.



The Immune System

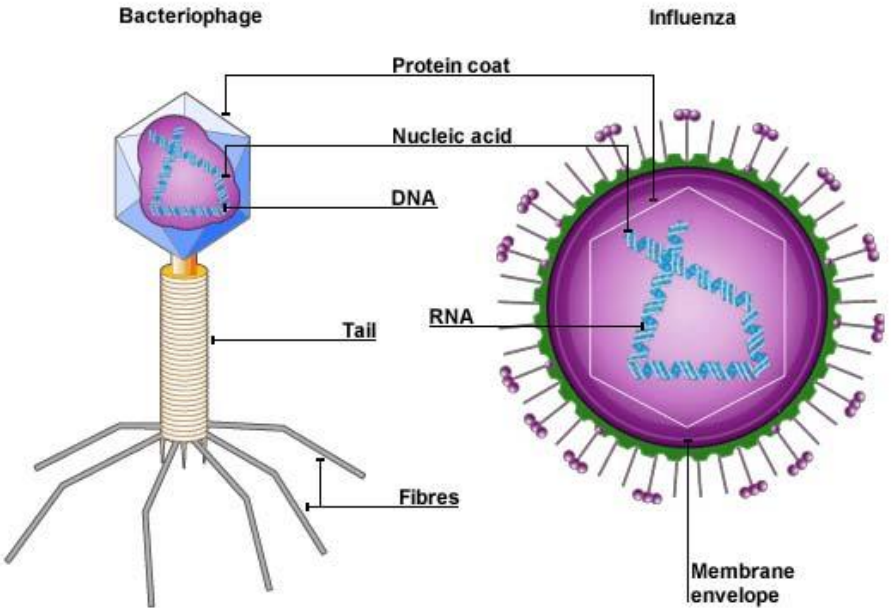
VIRUSES

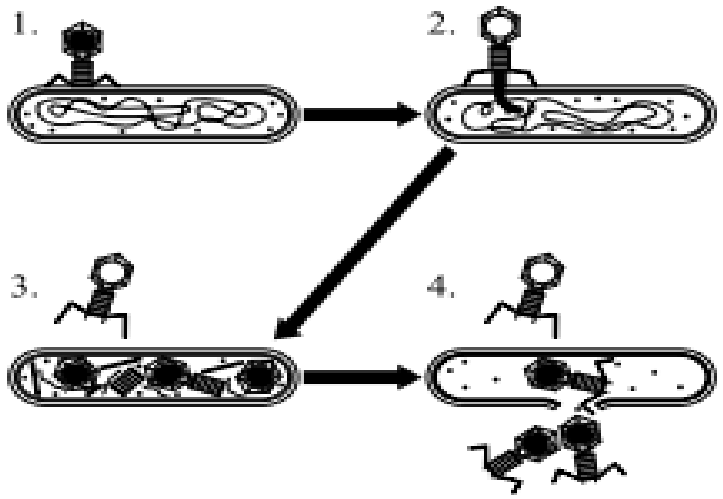
- A virus is a microscopic pathogen that can cause disease and sickness:
  - Common cold
  - HIV
  - Flu
  - Chicken Pox
- Cells that viruses infect are called <u>host cells</u>.



VIRUSES: STRUCTURE

- Viruses DO NOT have a **nucleus**!
- **DNA and RNA are inside the capsid (protein coat)**
- No organelles
- **Can only use their HOST CELL to reproduce** (can't do it on their own) –
  - *virus injects their DNA into a living cell and uses that cell to reproduce it's DNA.*

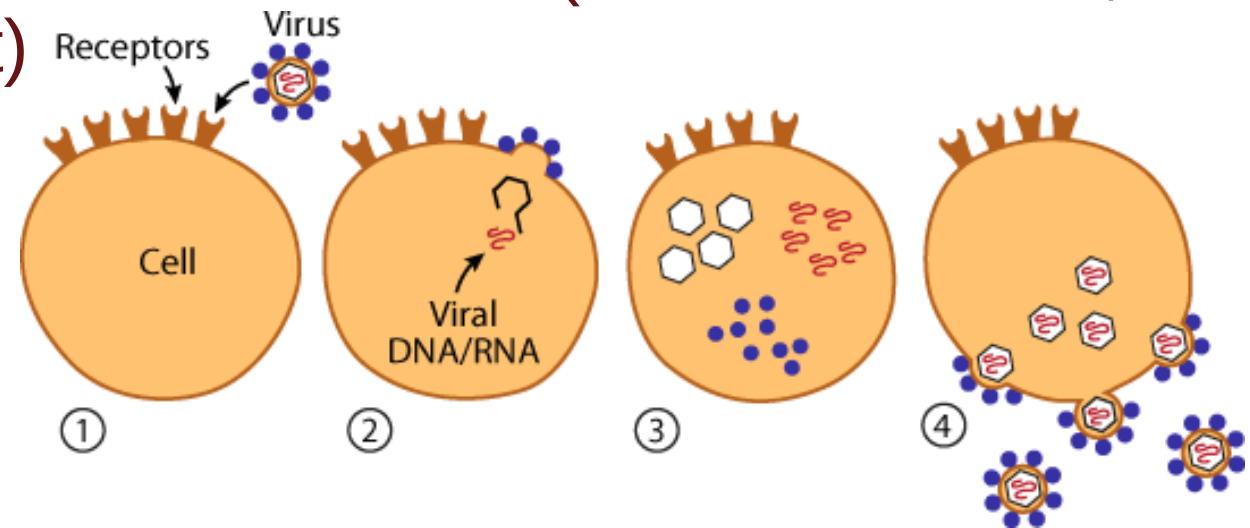




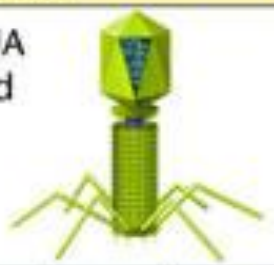
VIRUSES: LIVING OR NOT?

- NOT ALIVE!!
- Viruses rely on their host cell to perform many of their life functions:
  - Respiration
  - Eating
  - Reproduction

Viruses can be called PARASITES (live off of a host, hurting the host)



COMPARING LIVING CELLS & VIRUSES

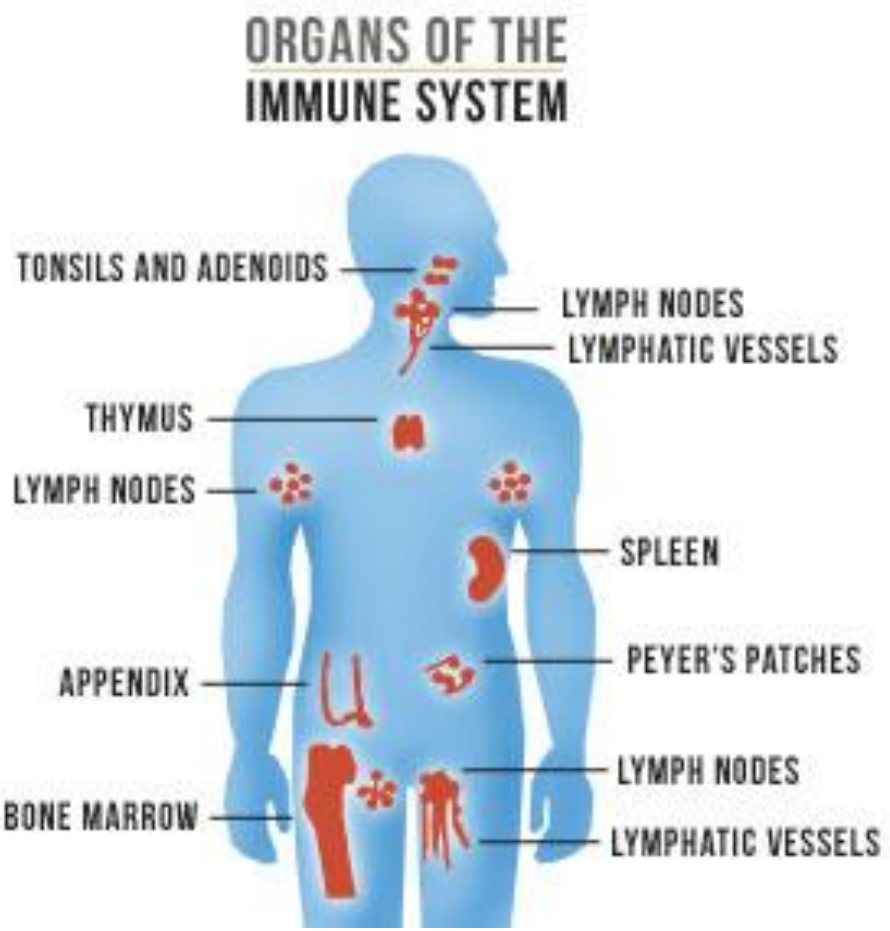
Viruses and Cells		
Characteristic	**Virus**	**Cell**
Structure	DNA or RNA core, capsid 	Cell membrane, cytoplasm; eukaryotes also contain nucleus and organelles 
Reproduction	only within a host cell	independent cell division either asexually or sexually
Genetic Code	DNA or RNA	DNA
Growth and Development	no	yes; in multicellular organisms, cells increase in number and differentiate
Obtain and Use Energy	no	yes
Response to Environment	no	yes
Change Over Time	yes	yes

<u>NOT</u> Living! **Living!**

THE IMMUNE SYSTEM

Function(job): to _____ (things that cause diseases) using special immune cells.

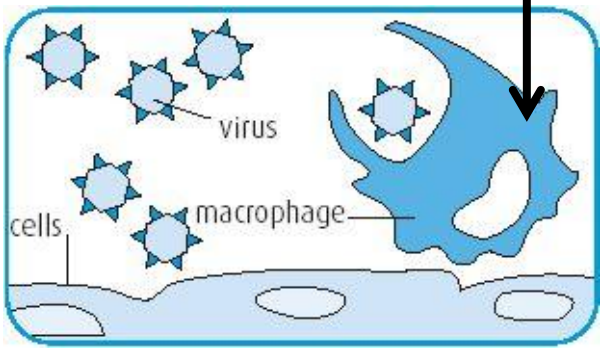
- **The Immune System includes:**
  - Spleen
  - Thymus
  - Lymph nodes
  - _____

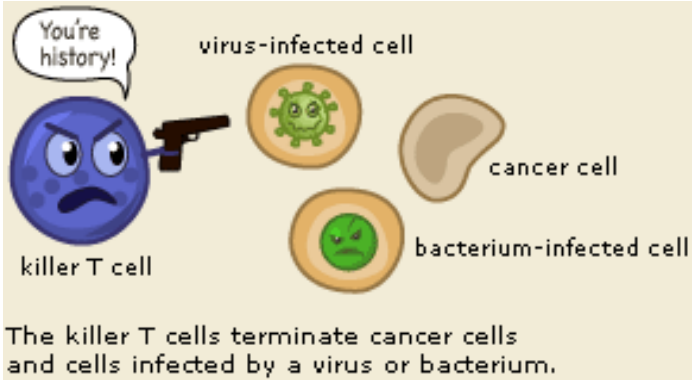


THE IMMUNE SYSTEM

- Spleen, thymus and lymph nodes help ***make*** and ***store*** special cells called white blood cells
- White blood cells _____ _____ _____.
  - **Macrophages**: kill pathogens _____ (using *endocytosis – cell eating*).
  - **T cells**: help kill pathogens _____.

Macrophage ("eater" white blood cell)





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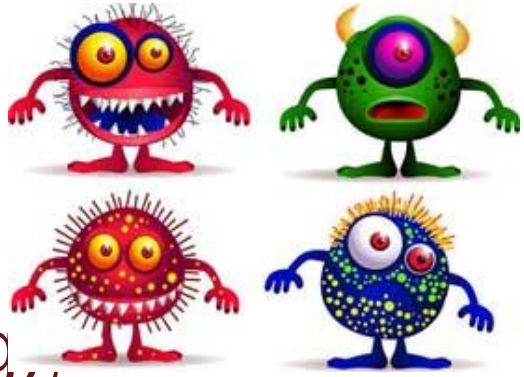
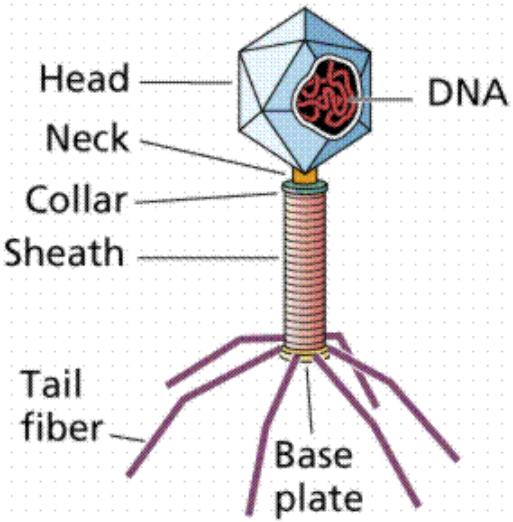


- things that _____:
  - _____ (like food poisoning),
  - **viruses** (like the cold virus or HIV),
  - fungi (like toe nail fungus)
  - _____.

Virus



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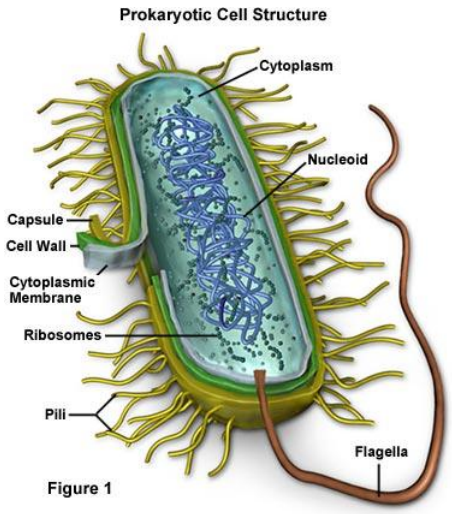
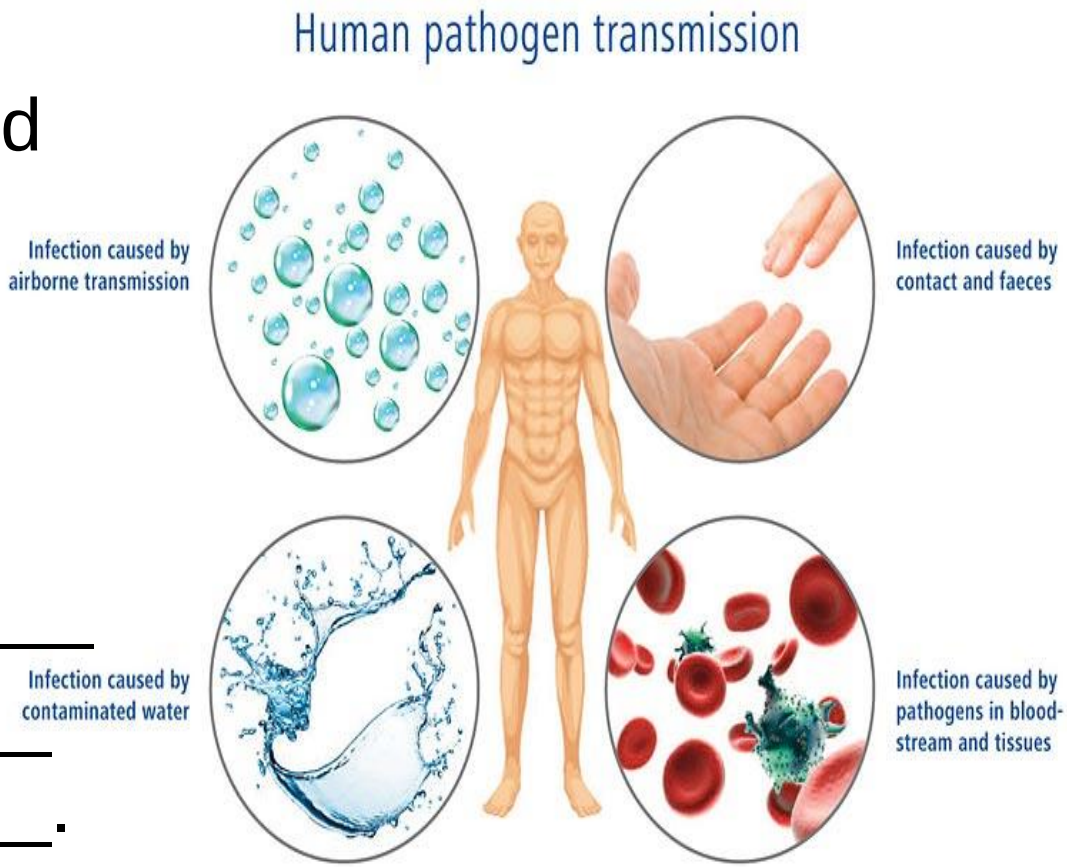


HOW YOU GET SICK

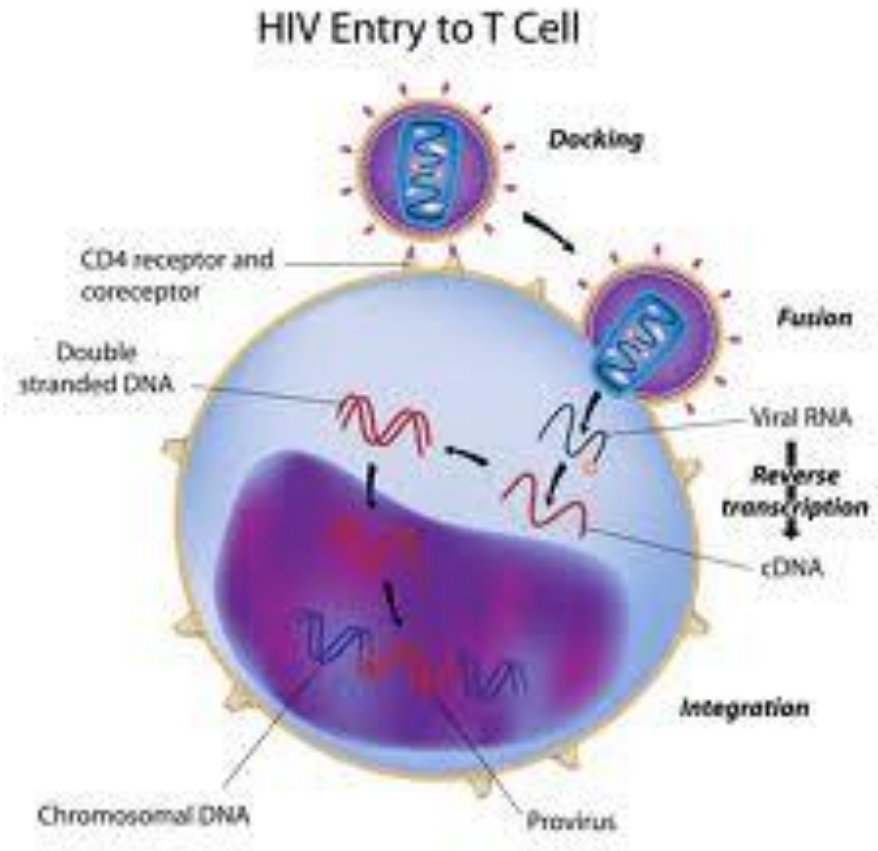
- You can get a pathogen by:
  - drinking or eating food or water that has the pathogen in it
  - breathing air with a pathogen in it
  - _____
  - _____

    _____.



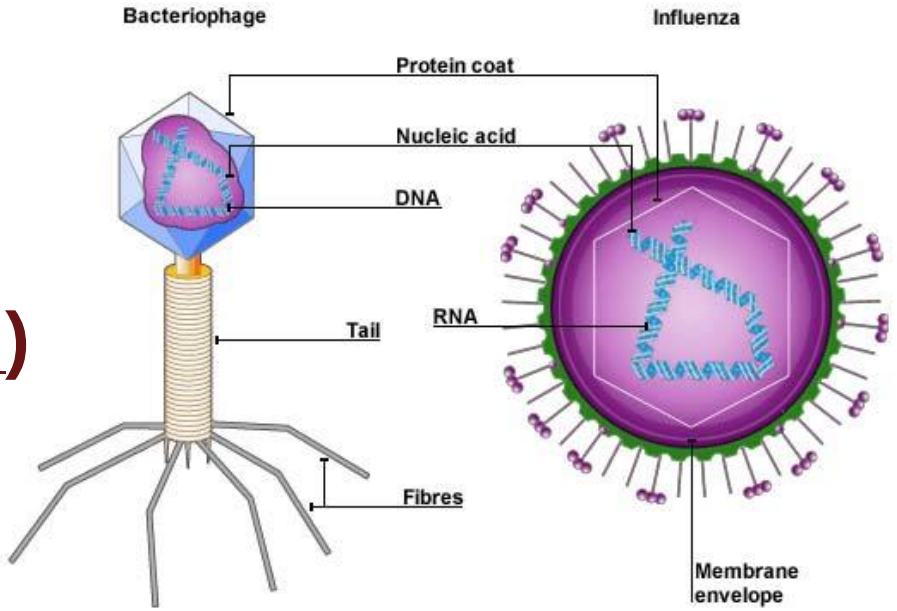
VIRUSES

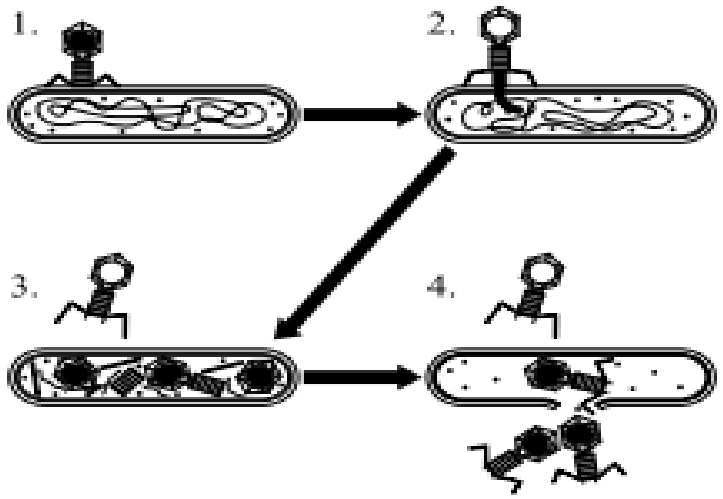
- A virus is a microscopic pathogen that _____ _____:
  - Common cold
  - HIV
  - Flu
  - Chicken Pox
- Cells that viruses infect are called _____.



VIRUSES: STRUCTURE

- Viruses _____ _____!
- **DNA and RNA are inside the capsid (_____)**
- No organelles
- **Can only use their HOST CELL to reproduce** (can't do it on their own) –
  - *virus injects their DNA into a living cell and _____ _____.*





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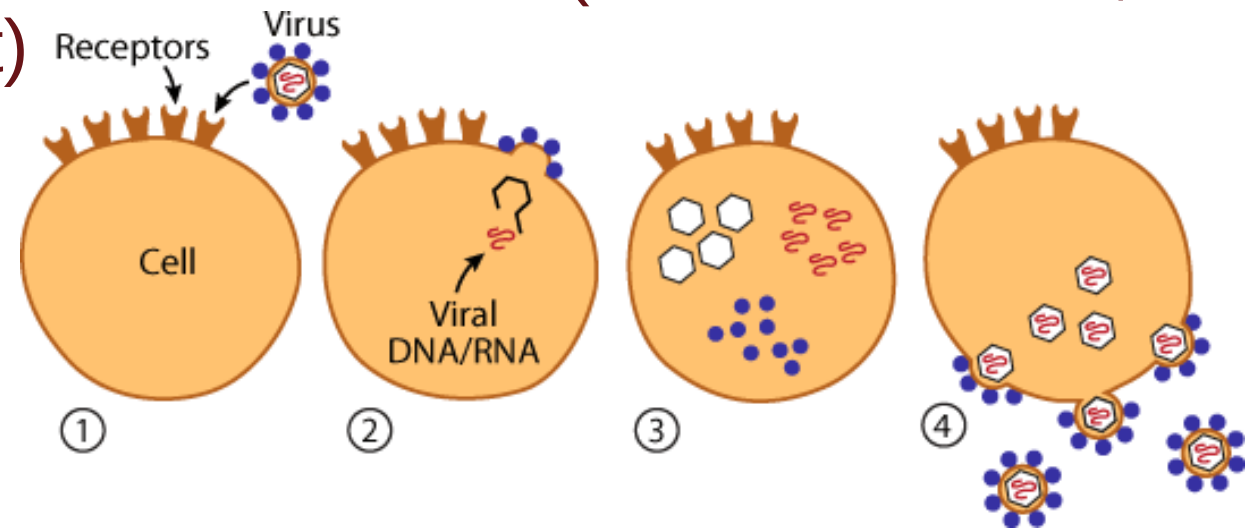

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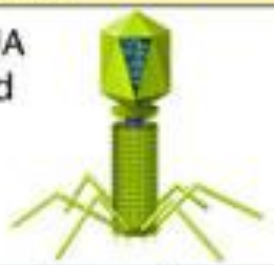
Structure	DNA or RNA core, capsid 	Cell membrane, cytoplasm; eukaryotes also contain nucleus and organelles 
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