

# The Immune System & Viral Specificity

Answer the following questions using your textbook:  
Miller & Levine p. 969 -972 or Nelson p. 201 – 204.

1. What is a pathogen?
2. Name the system that defends the body against pathogens?
3. Explain the non-specific response and the specific response of the body.
4. COPY: **Primary line of defense** = skin mucous, membranes, tears, digestive enzymes **non – specific response**

**Secondary line of defense**=phagocytic white blood cells (engulf foreign bodies (viruses, bacteria..) **non-specific response**

**Tertiary line of defense** = lymphocytes – white blood cells that produce antibodies (active immunity) **specific response**

5. What are interferons?
6. A) What is an antigen?  
B) What is an antibody?

1. What is a pathogen?

Anything that causes a disease

2. Name the system that defends the body against pathogens?

The Immune System

3. Explain the non-specific response and the specific response of the body.

**Non-specific response** = body's first line of defense against disease. Tries to prevent you from getting sick in the first place.

**Specific response** = if pathogen gets by 1<sup>st</sup> line of defense.

Where there are *specific* antibodies made that will recognize a virus & prevent it from infecting the host.

4. COPY: **Primary line of defense** = skin mucous, membranes, tears, digestive enzymes **non – specific response**

**Secondary line of defense**=phagocytic white blood cells (engulf foreign bodies (viruses, bacteria..)) **non-specific response**

**Tertiary line of defense** = lymphocytes – white blood cells that produce antibodies (active immunity)**specific response**

## 5. What are interferons?

Small proteins produced by cells when they are infected with a virus, that help other cells resist viral infection (when released from a virus infected cell).

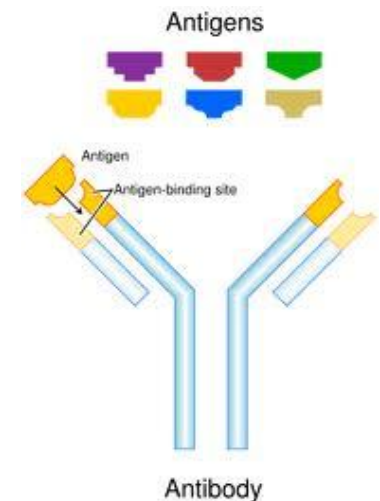
They seem to make it more difficult for the virus to infect other cells – “interferes” with a virus

## 6. A) What is an antigen?

A protein that stimulates the production of antibodies.  
These proteins are on the invader / foreign body & identify it as foreign. Found on surface of pathogen

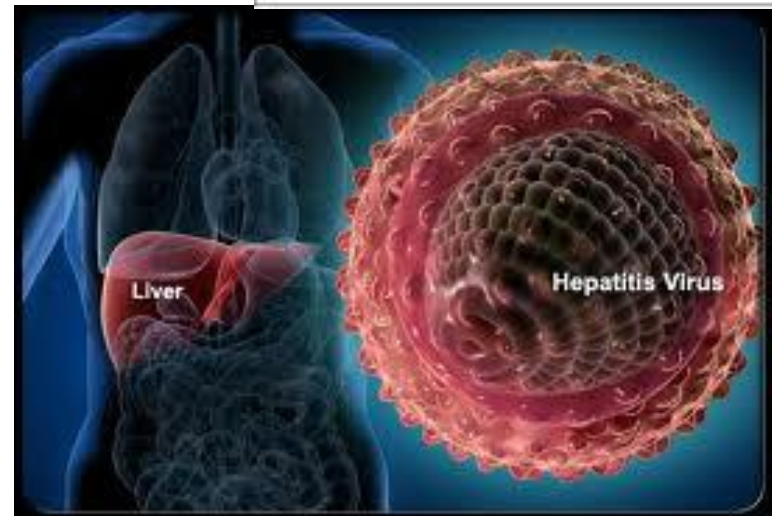
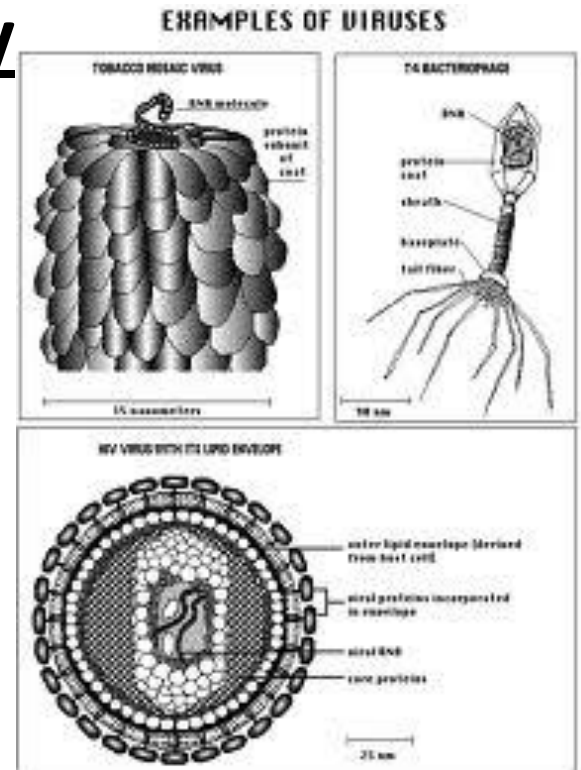
## B) What is an antibody?

Proteins in the blood that react with antigens – flag the pathogen for destruction by a white blood cell



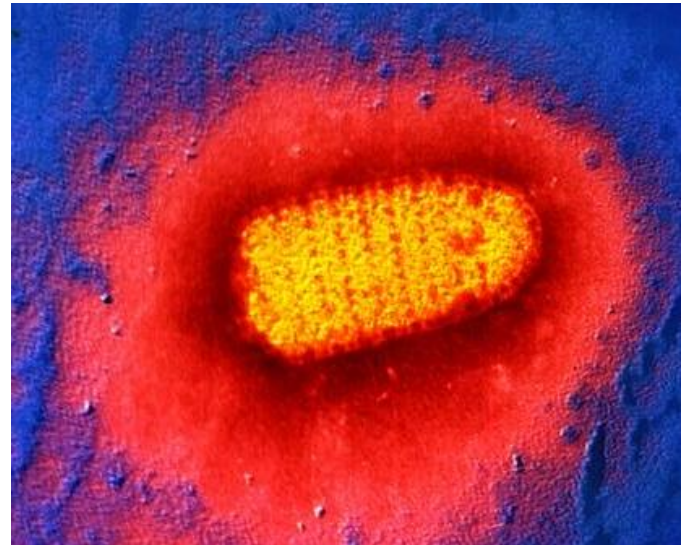
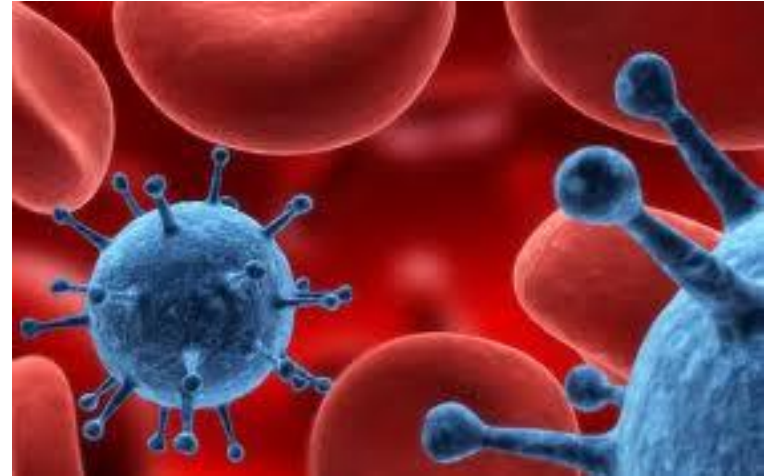
# Viral Specificity

- A virus infects a specific host: only plants, only animals, only fungus or only bacteria.
- Some are very specific in that they infect a particular species such as only humans, only peach tree etc...
- As well, viruses may infect only specific cells of the body  
Ex. Influenza infects lung cells



# Host Range: the number of different species a virus can infect

- Narrow host range = infects only 1-3 species.
  - Ex. Human cold virus
- Broad host range = infects many different species
  - Ex. Rabies – infects mammals & birds





- A virus identifies the host cell by a “lock & key” system.
  - Antigen on the outside of the virus fit into a specific receptor site on the host cell’s surface.

