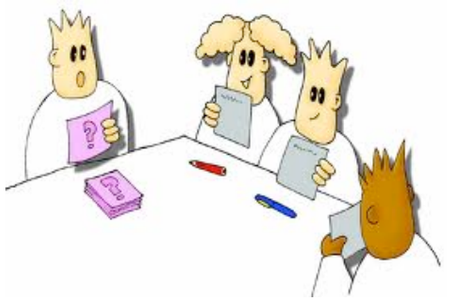
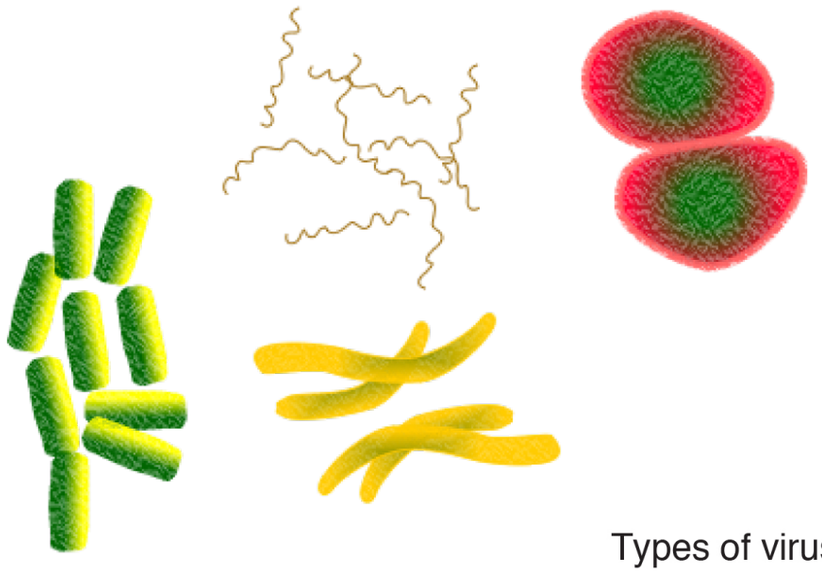
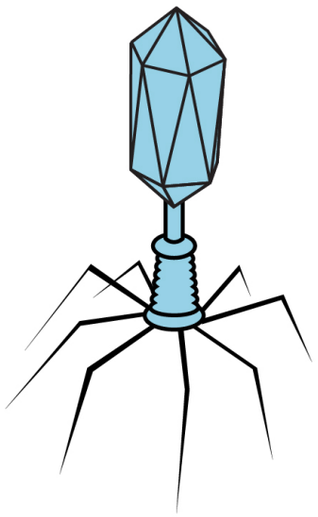
Defence Against Infectious Disease (6.3)



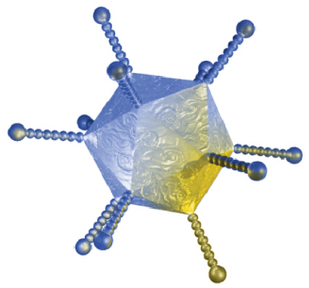
Identify 6 ways your body combats against disease and infection



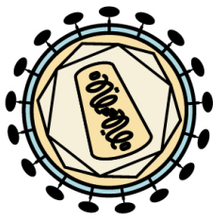
Types of viruses



Bacteriophage



Adenovirus



Human Immunodeficiency Virus

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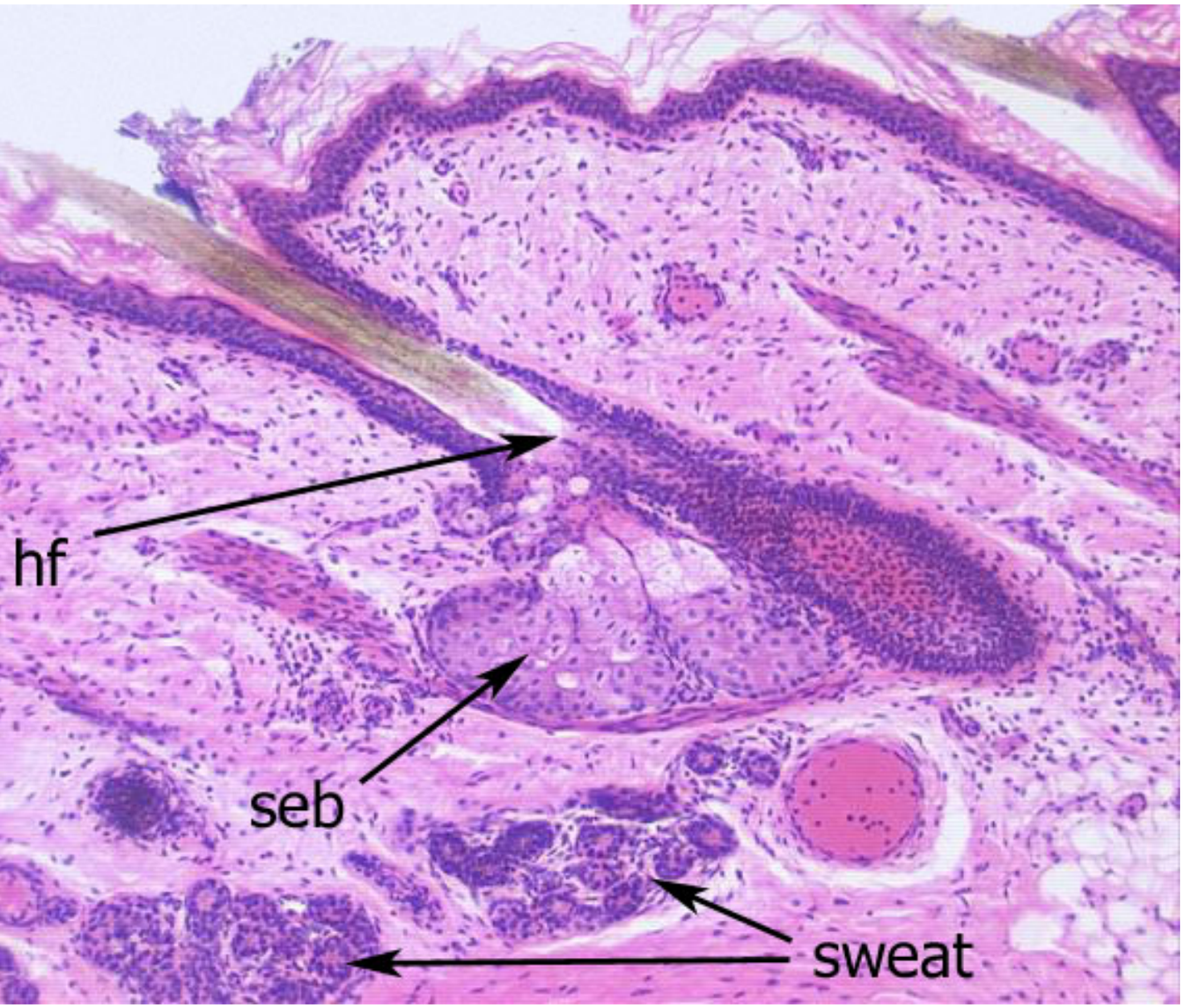
- Skin protection
- Mucus membranes
- Antibodies
- Blood clotting
- Phagocytes or macrophages
- pH

Integument (Skin)



For invader, the body provides:

- *Heat*
- *Proper pH*
- *Nutrients*

• The skin and mucous membranes form a primary defence against pathogens that cause infection

•Provide a tight barrier

•Sebaceous glands make sebum

- lowers pH (inhibits bacteria and fungi)

• Mucus provide physical barriers at each entry pt. A sticky solution of glycoproteins (Nose, throat trachea, reproductive parts)

• contains antibacterial enzyme called lysozyme

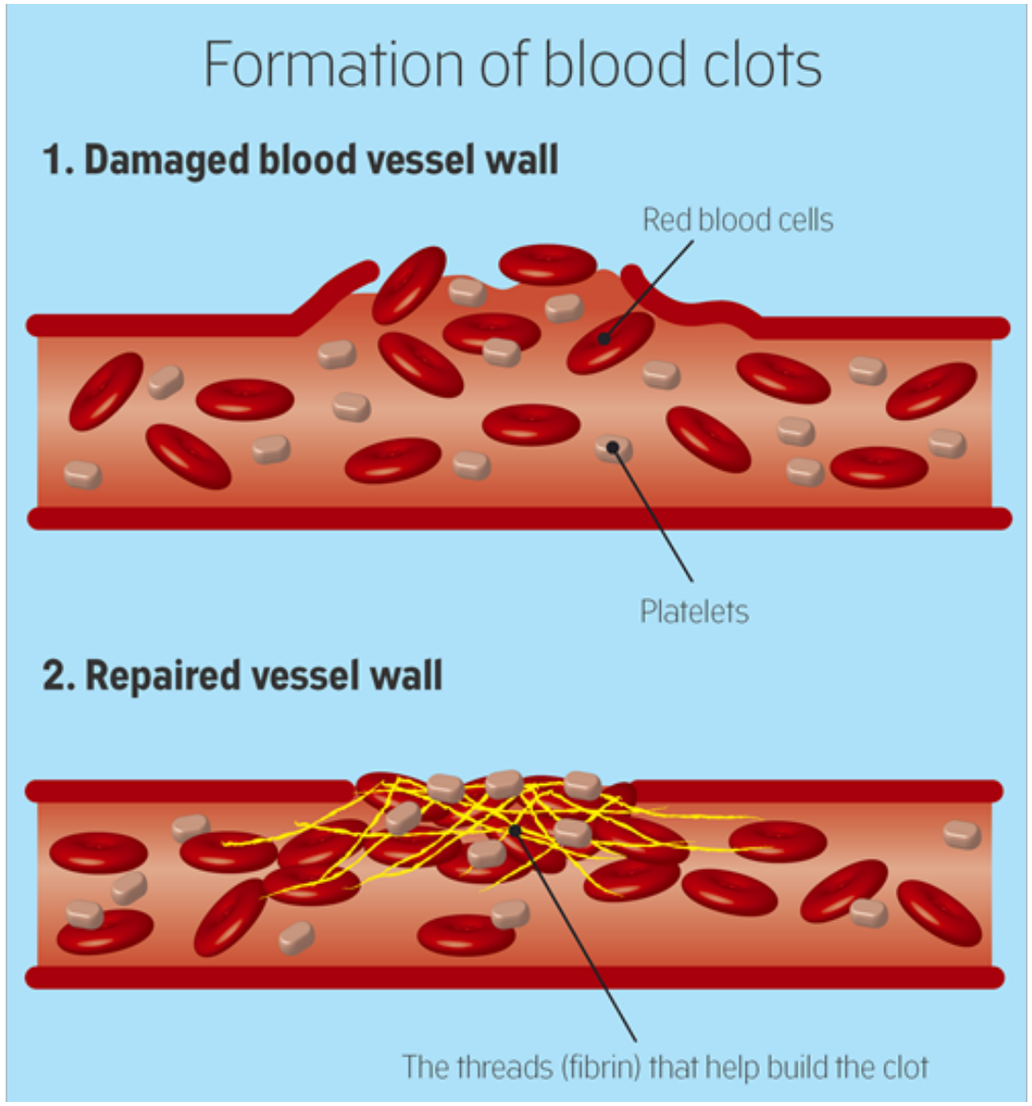
Cuts and Clotting

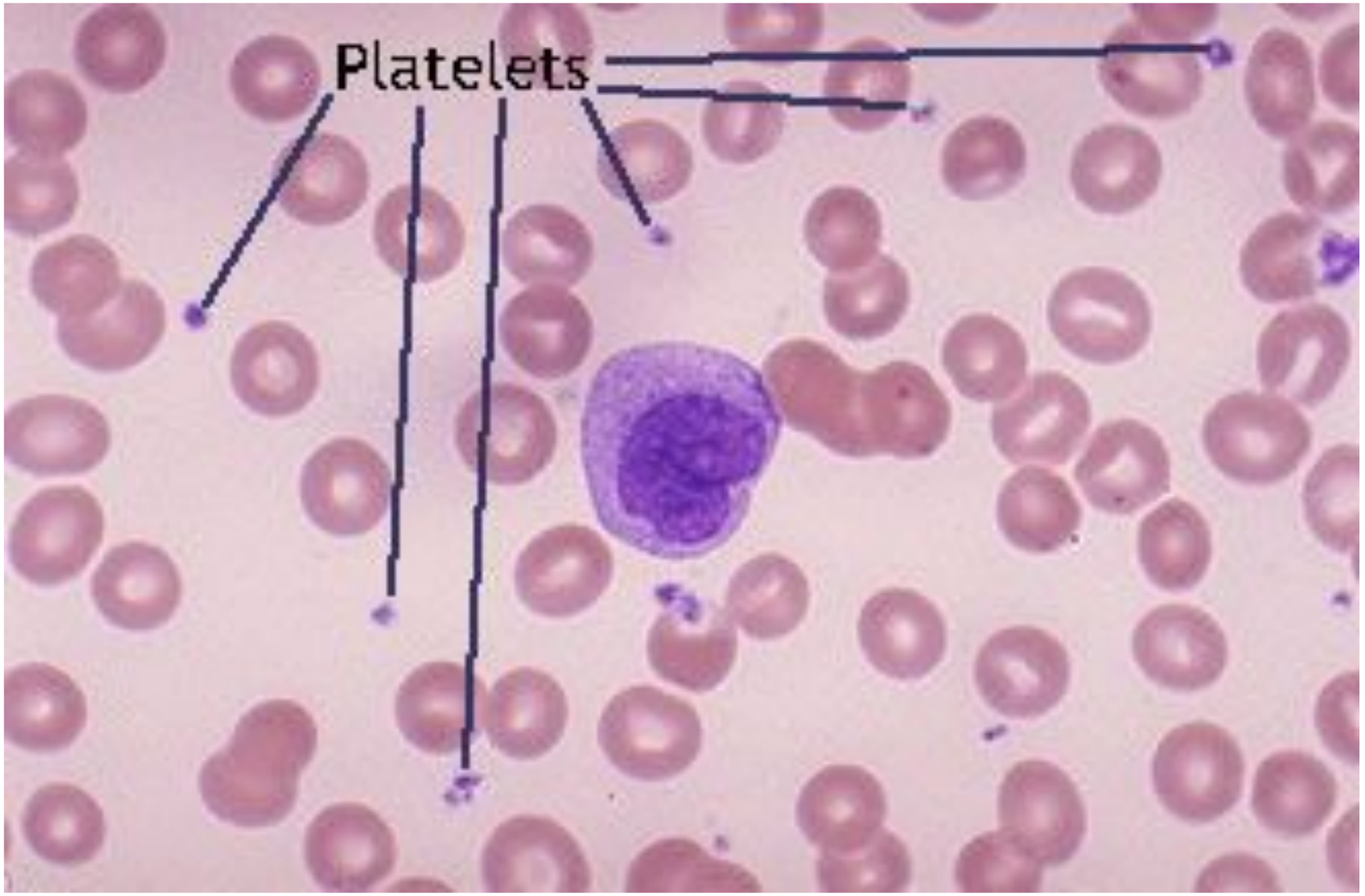
• Cuts are sealed by clots which form when there are breaks in the skin and vessels.

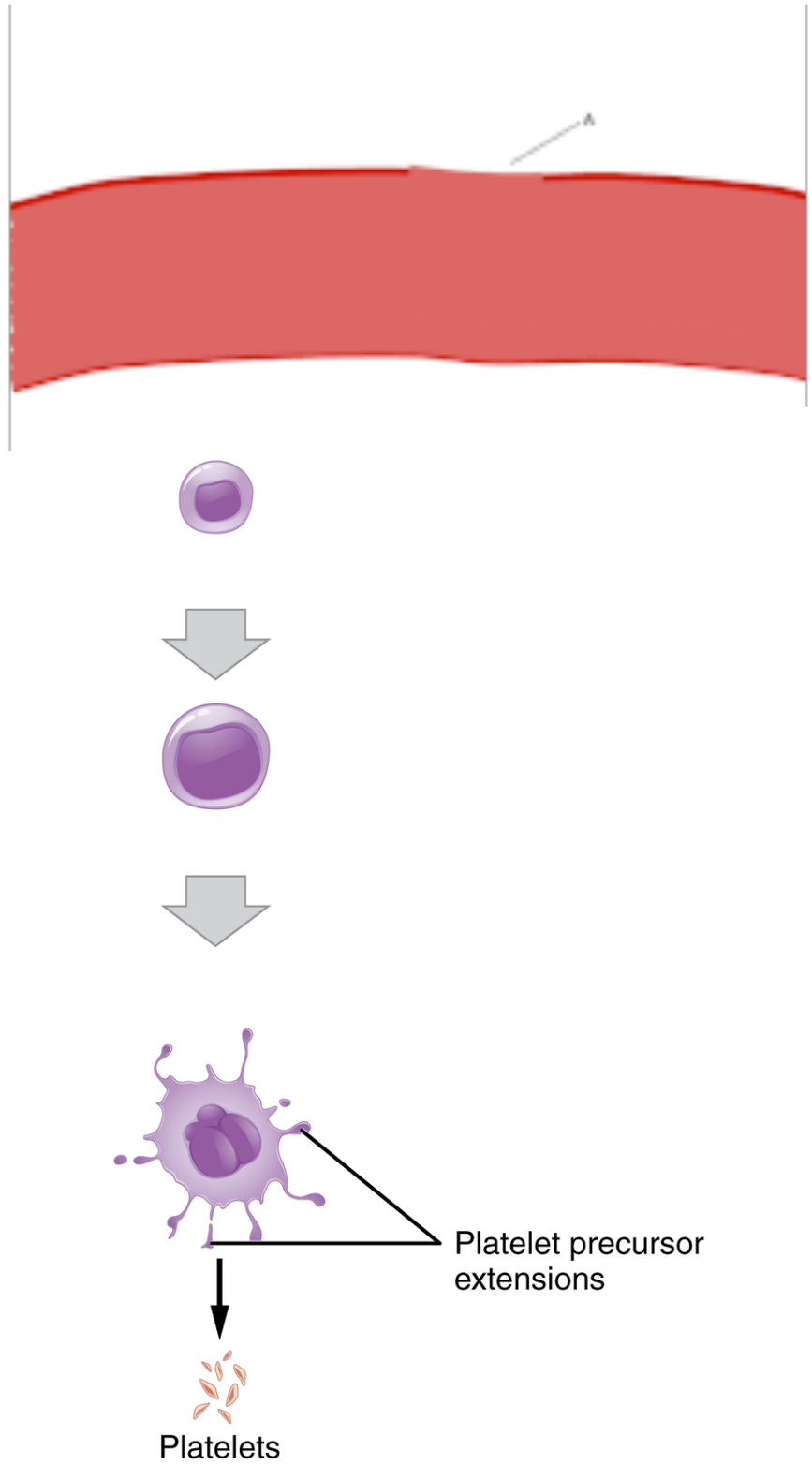
• prevents blood loss

• Maintains blood pressure

• Reduces invader infection



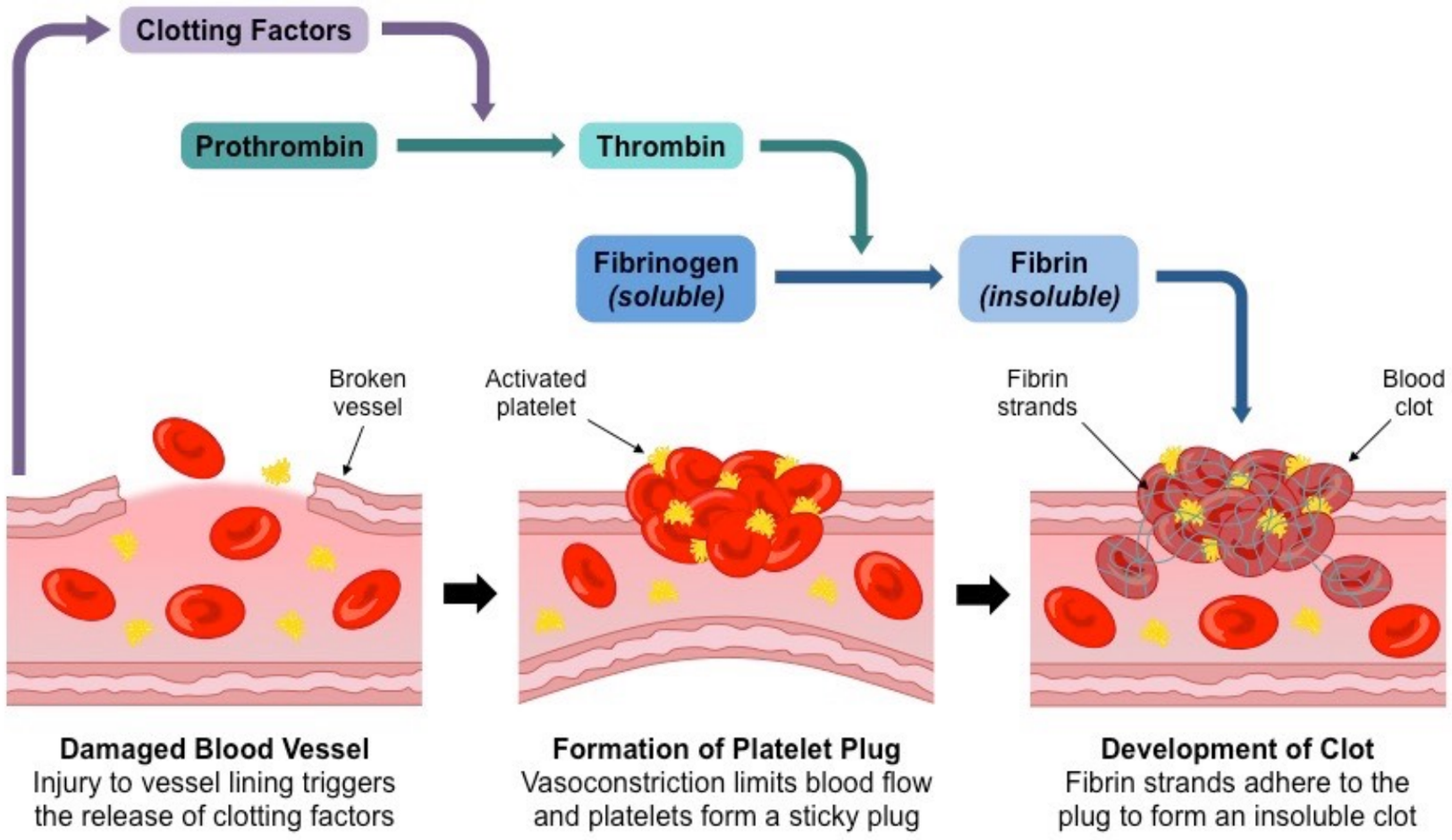




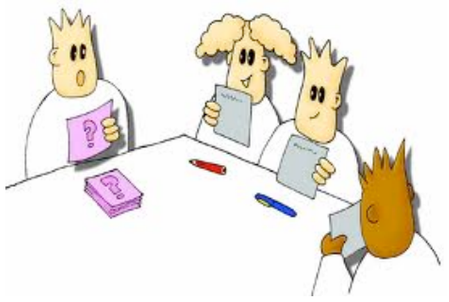
Platelets

- are fragments of cells when mature and functional
- no nucleus
- respond to breaks in circulation

The Clotting Process



- A Cascade of reaction working to stop bleeding
- Initiated by breaks that release clotting factor
- constriction in the vessel results in platelets forming a sticky plug with RBC's
- clotting factors initiate thrombin production, which in turn stimulates insoluble fibrin production from soluble fibrinogen
- Fibrin forms a mesh—> catches more platelets and RBC's to form a gel plug
- Dries to form scab



Place the following processes in the order in which they occur.

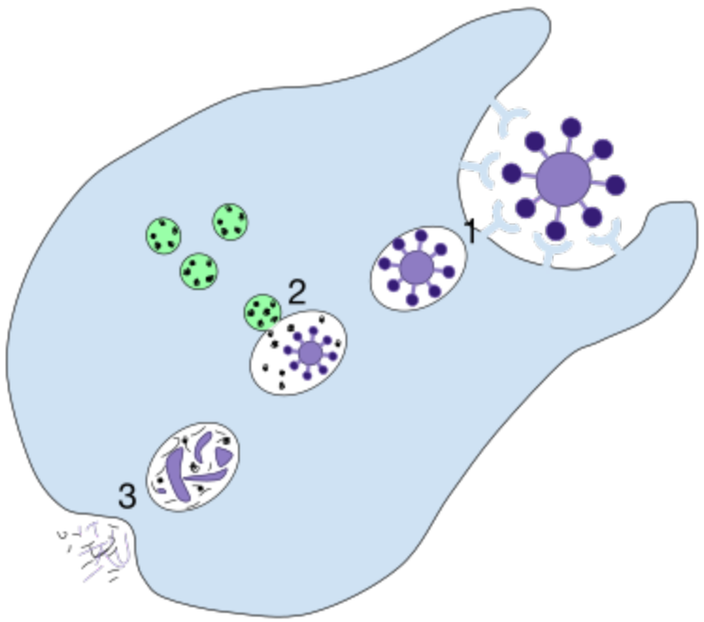
a. The formation of the scab.
b. The formation of the gel plug
c. The skin is broken
d. Fibrinogen is converted into fibrin
e. A fibrin mesh forms
f. Prothrombin is converted into thrombin
g. Clotting factor is released
h. Platelets gather at rupture

As you watch the video,

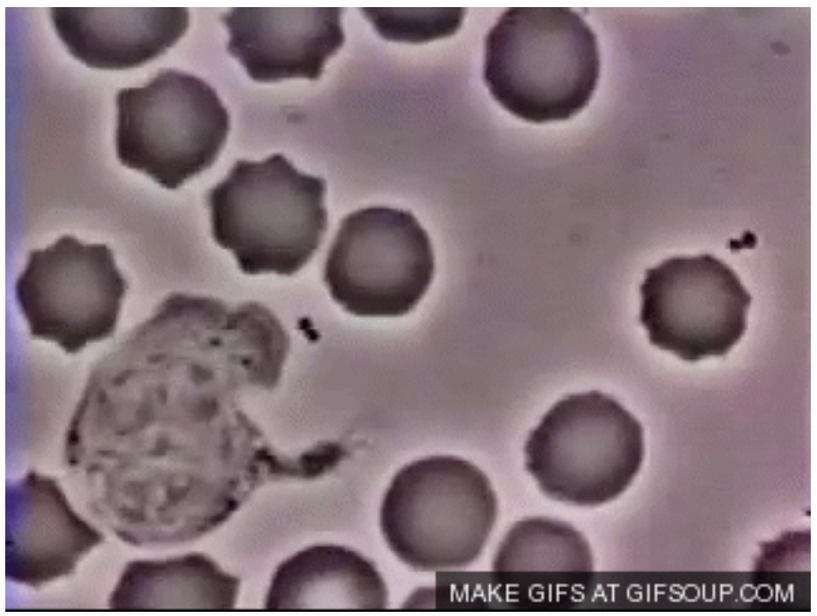
a. What are risk factors that are correlated the chance of forming a thrombus or unwanted blood clot?

b. What are serious side effects of thrombosis ?

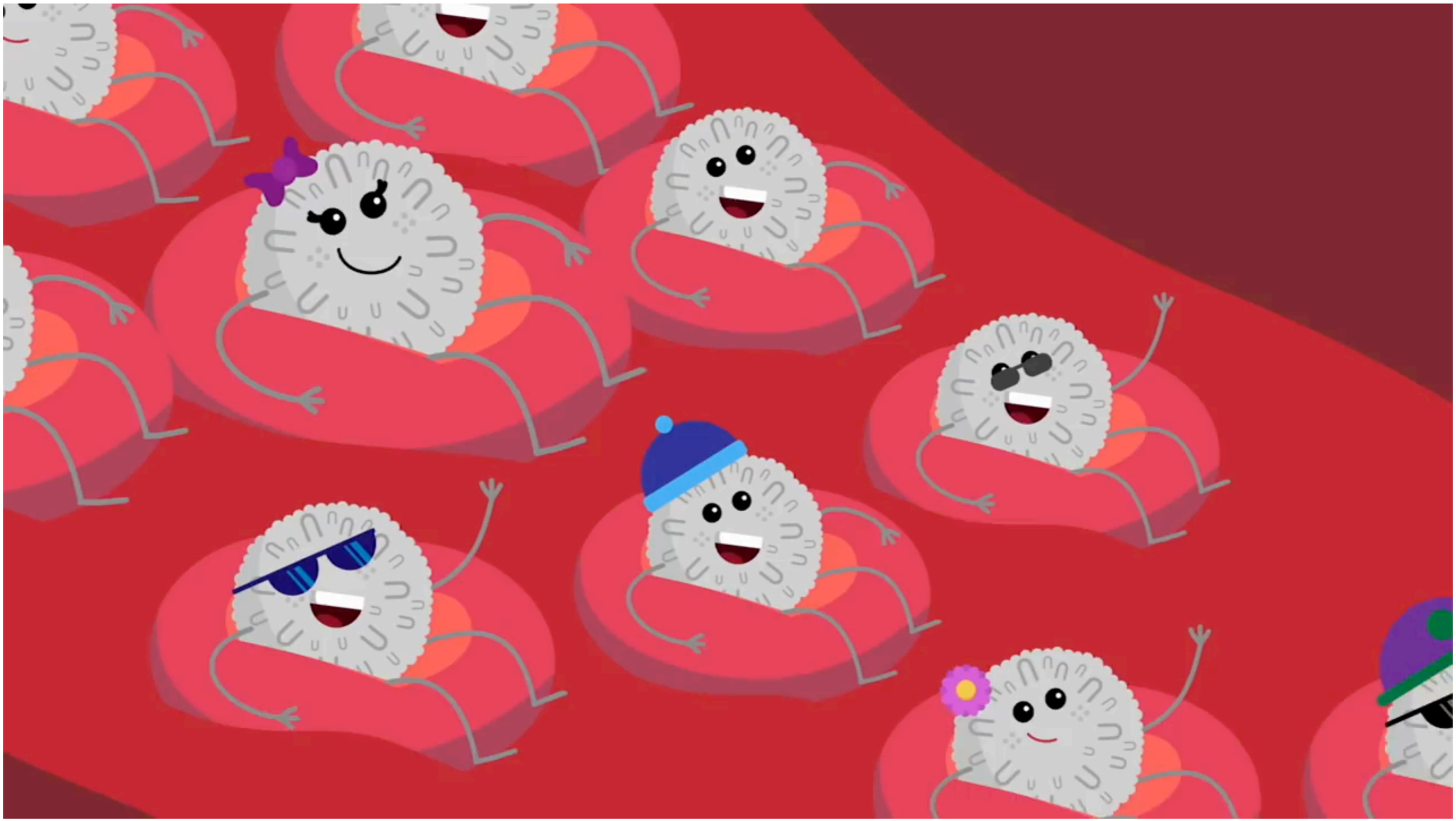
Phagocytes



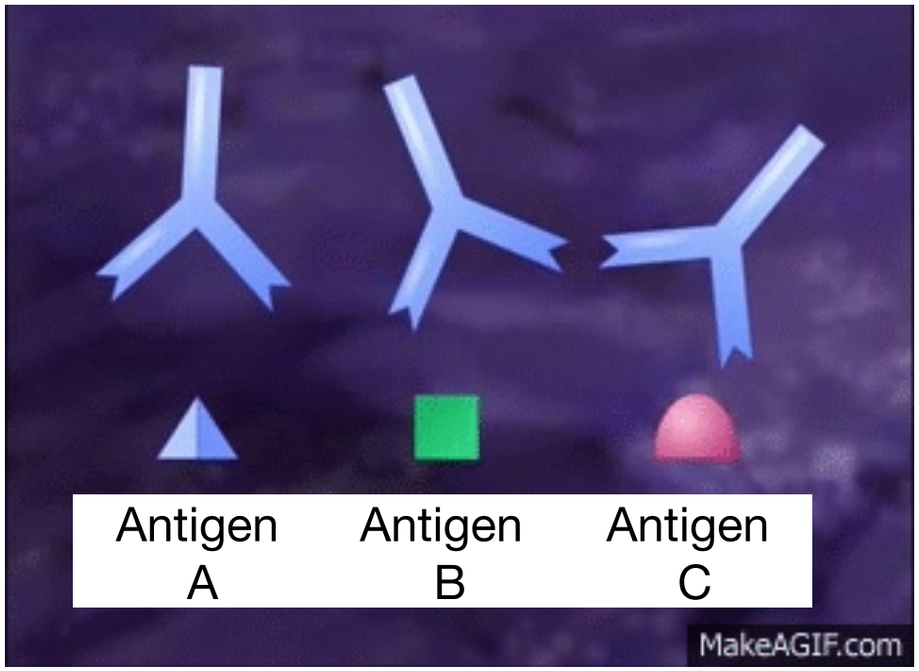
Phagocytosis



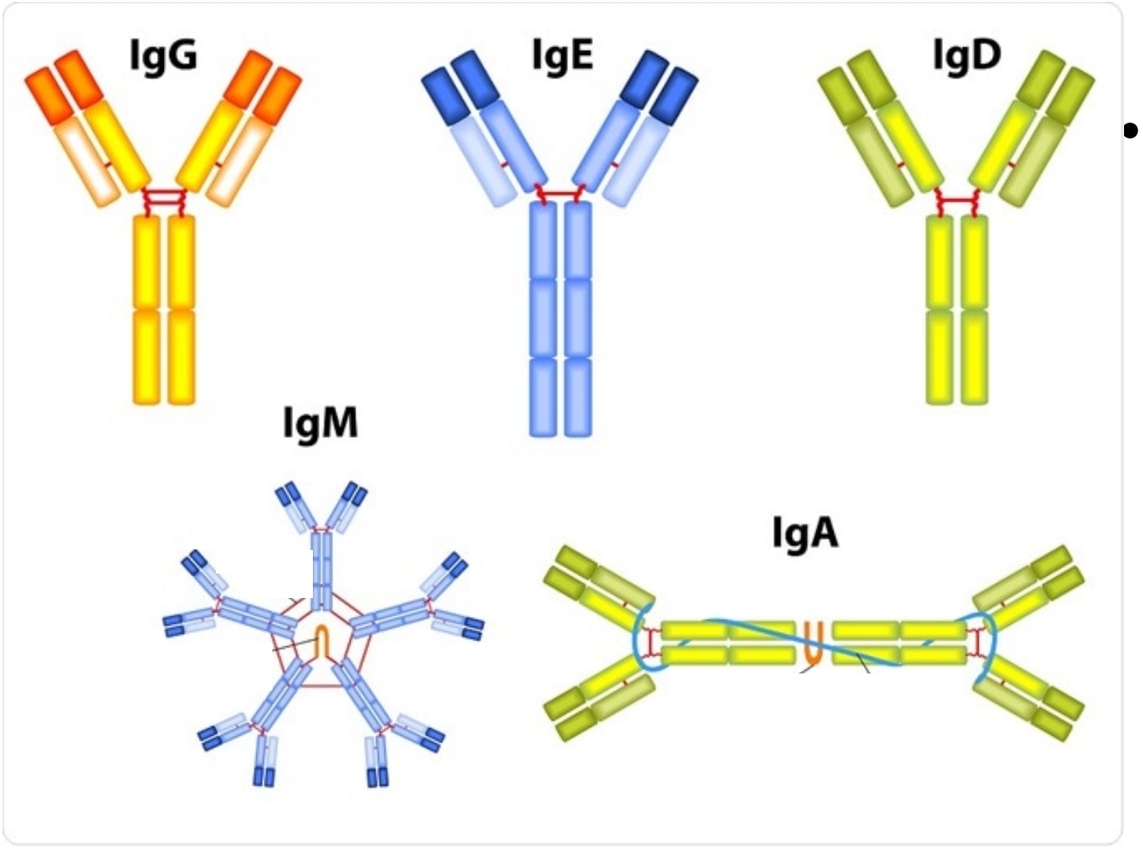
- A type of White blood cell (AKA macrophages)
- Ability to squeeze out of capillaries to infection
- engulf pathogens through ‘phagocytosis’
    - forms a vesicle around invader
    - merges with lysosome
    - cellular digestion
    - exocytosis to eliminate waste
- puss in infected areas are composed of many phagocytes

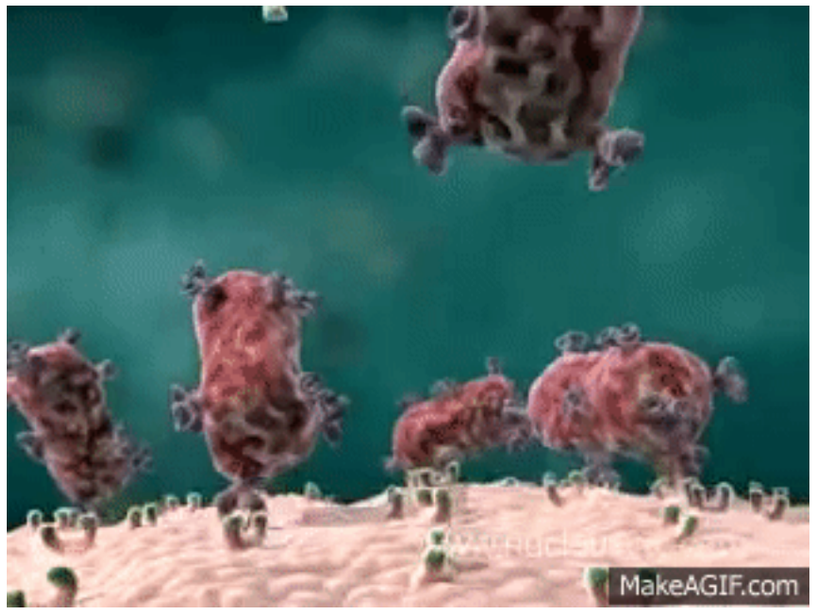


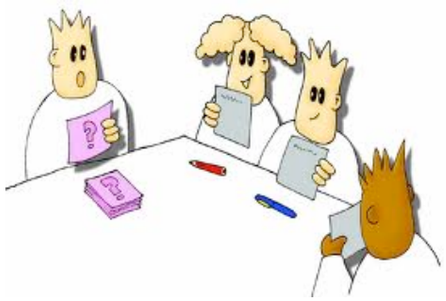
Antibodies



- **proteins**
- made by **lymphocytes**
- bind to foreign (invading) proteins or molecules called **antigens**
- antibodies are specific in their binding - **have variable regions** for specific binding
- different types of antibodies
  - some attach invasion
  - some provide infection memory



- Once bond to an antigen
  - phagocytes can attach
  - invaders like viruses can’t dock or enter
  - 



a. **List** three characteristics of Antibodies

b. **State** three ways infections are prevented

c. H1N1 or swine flu was highly prevalent in 2009. As a result, many people were worried that the strain, which was somewhat different from the 1976 strain, would caused significant death rate increase for those affected. **Deduce** why people aged 15 and 44 had a higher rate of infection compared to seniors?

Assignment

- How is HIV effective at fitting our immune systems?
    - Where does it specifically attach?
    - How does this affect the system?
    - How does the virus get in to the body?
    - How effective is it’s initial invasion
- What are symptoms of HIV infection?
- What are long term effects of HIV infection?
- What are the risk factors for viral transmission?
- What does the medications prescribed for infection do?