

clotting of blood

Clotting begins when the fragile membranes of the blood platelets rupture on escaping from a cut blood vessel. The platelets release *thromboplastin*, which, with calcium ions in the blood, changes *prothrombin* (the inactive form of the enzyme) to *thrombin* (the active enzyme). The thrombin, in turn, reacts with other blood protein, *fibrinogen*, to form *fibrin*, which is an insoluble protein. Strands of fibrin form a meshwork over the wound and trap blood cells. The clot dries out, forming the scab.

Questions

1. What vitamin is necessary for normal clotting, and what role does it play?
2. What is the first step in the clotting process?
3. From what substance is a blood clot actually formed? _____
4. What is the name of hereditary disorder in which the blood does not clot properly?

5. What substance produced by the liver prevents clotting within the circulatory system?

6. What does the serum fraction of the blood consist of?
7. What role do calcium ions play in blood clotting?

blood types

There are four major types of blood in humans—A, B, AB, and O. Blood type is determined by the presence or absence of certain proteins called *agglutinogens* on the surface of the red blood cells. Type A blood has the A agglutinogen; type B blood has type B agglutinogen; and type AB blood has both A and B agglutinogens. Type O blood has no agglutinogens.

In the plasma of people with types A, B, and O blood are proteins called *agglutinins*. Type A blood has type b agglutinin; type B blood has type a agglutinin; and type O blood has both a and b agglutinins. Type AB blood has no agglutinins. The agglutinins react with the agglutinogens of the same type, causing the blood cells to clump together.

Blood type is of basic importance when it comes to transfusions. A person cannot be given blood of a type to which his own blood has agglutinins. For example, if a person with type A blood (b agglutinins) is given type B blood, the clumping reaction between the b agglutinins and the B agglutinogens could be fatal.

Questions

1. Fill in the blanks in the table below, specifying which agglutinin and which agglutinin are present with each blood type.

BLOOD TYPE	AGGLUTINOGEN	AGGLUTININ
A		
B		
AB		
O		

2. Fill in the blanks in the table below on transfusions.

BLOOD TYPE	CAN RECEIVE	CAN BE GIVEN TO
A		
B		
AB		
O		

3. What determines blood type?
4. Which blood type is the *universal donor*? _____
5. Which type is the *universal recipient*? _____
6. What happens if a person with type A blood is given a transfusion of type B blood?
7. Why are people sometimes given transfusions of blood plasma?

Rh factor

The Rh factor is a protein found in the red blood cells of approximately 85% of the population of the United States. People whose blood contains this protein are said to be Rh-positive (Rh+), while those whose blood lacks it are Rh-negative (Rh-). The Rh protein is an agglutinin. Nor-