

# Composition of Blood and Coagulation

Rebecca Paul\*

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### INTRODUCTION

**B**lood is a specialized connective tissue in which there is a liquid intracellular substance known as plasma and formed element like RBC, WBC and platelets suspended in plasma. The specific gravity of whole blood varies from 1.055 to 1.060. When freshly shed the blood in red in colour thick and slightly alkaline.

### Function of Blood

Transport of respiratory gases  
Transport of nutrition  
Blood acts as vehicle  
Drainage of waste products  
Maintenance of water balance  
Maintenance of acid base equilibrium  
Regulation of body temperature and blood pressure

### Composition

Blood is highly complex fluid which is composed of 2 parts plasma and cells. The cells are called blood corpuscles. The plasma constitutes about 55% and cells about 45% of the total volume of human blood.

### Whole Blood Cells

Blood cells are of 3 types, they are 1. Red blood cells 2. White blood cells 3. Platelets

### Red blood cells

These are also called erythrocytes. These are most numerous cells in blood. The number of RBC in children than adults RBC is formed in bone marrow. While in embryonic stages in liver and spleen. The production of RBC is called erythropoiesis. RBC lives for 120 days in blood. Old RBC is destroyed in spleen.

### White blood cells

These are also called as leucocytes. WBC has pigment hemoglobin. So they are colorless. The life span of WBC is 12-13 days. Old WBC is destroyed in blood and liver. Two types of WBC are found in blood granules, granules.

### platelets

These are overall round in shape. They don't have nucleus, cytoplasm is present. These cells play important role in blood clots.

### Plasma

Plasma is the liquid part of blood. It is straw in color and slightly alkaline in nature. About 91% to 92% of plasma is water. Plasma contains organic and inorganic constituents.

### Organic constituents

Proteins are 7.5 % are present. Serum albumin, serum globulin and fibrinogen and prothrombin are present. In non proteins nitrogenous substances contain urea, uric acid, xanthine, hypoxanthine, creatinine ammonia amino acid. Carbohydrates, glucose are present. Other substances like internal secretions, antibody and enzymes are also present.

### Colour

Yellow colour of plasma is due to small amounts of bilirubin, keratin and xanthophylls. 0.9 of inorganic compounds are present in blood like Na, K, Ca, Mg, Fe, Cu, etc. In normal human blood, plasma volume is proportional more than total corpuscles volume. The plasma volume varies from 52-55% where as corpuscles varies from 45-48%.

### Coagulation

Blood coagulation is the major body defense mechanism against blood loss. In coagulation so many factor are involved like fibrinogen, prothrombin, thrombin, calcium, proaccelerin, reconverting, anti hemophilic factor, Christmas factor, Stuart power factor etc. The term hemoglobin is applied to sequence of physiological responses to stop bleeding. The final phase involves complete dissolution of clot. Aggregation of platelets to form a clump that can be stop mainly minor bleeding.

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Department of Haematology, George Washington University Washington, USA.

\*Correspondence: Rebecca Paul, Department of Haematology, India Institute of Sciences, India.

Email: paulr@gmail.com

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