

BLOOD

**Introduction: Tissue Chemistry
and Biological Fluid.**

Biochemistry has passed from a state of descriptive to quantifiable science.

Clinical Biochemistry is one of the most rapidly advancing areas of laboratory and clinical medicine. The marked increase in the number and availability of laboratory diagnostic procedures has helped in the solution of clinical problems.

Biochemist should always be interested in things about metabolic sequence such as:

- **The description of the enzymes & chemical changes that comprise the metabolic sequence.**
- **The rate at which material can be transformed by the sequence.**
- **The amount of material utilized by the sequence among living things.**
- **The nature of the control mechanisms which adjust the amounts of material utilized by the sequence.**

Metabolic changes associated with specific disorders may give rise to a change in the biochemical profile of a particular body fluid, e.g. blood glucose in diabetes mellitus. Specific parameters are looked for in a specific body fluid when a disease is suspected.

Body fluids that is produced by human body and serves a purpose in maintaining homeostasis of the body environment (Blood, Lymph, Pericardial fluid, Pleural fluid, Peritoneal fluid, etc).

Water is the principal body fluid & essential for life

Roughly, the contributions of the different tissues to the body's metabolism are proportional to the weights of the tissue and the biological fluids

	Wet weight (kg)	Protein content (kg)
Skeletal muscle	30	6.6
Adipose tissue	13.2	0.92
Stomach & intestine	7.25	1.34
Liver	1.6	0.35
Brain	1.36	0.136
Kidneys	0.29	0.05
Heart	0.29	0.06
Adrenals	0.014	?
Blood	6.4	1.02
Skin	4.9	?
Bone	12.0	1.23

Activity of tissue is determined by its enzyme content and metabolic products. The body can be crudely divided into two components.

Circulating Tissues	Biological Tissues
Blood	Cartilage
Water	Bone
Lymph	Skin
Interstitial fluid	Muscles
Cerebrospinal fluid	Liver

Blood

- It is the fluid tissue in body.
- Specialized type of connective tissue in which formed elements are suspended in non living fluid matrix called plasma.

Viscosity: sticky opaque fluid, due to the presence of RBCs (sticky and thick), viscosity (thickness) = 4 – 5.

Color: Scarlet red (crimson) high-oxygen or dark red poor-oxygen

PH: 7.35-7.45

Temperature: Blood temperature is slightly higher than body temperature.

Blood volume: 5–6 L for males; 4–5 L for females. Blood accounts for approximately 8% of body weight. The amount of blood varies with body size, changes in fluid concentration, changes in electrolyte concentration, and amount of adipose tissue.

Density (specific gravity): Refers to the weight of blood compared to water. Specific gravity of H₂O is taken as 1 (i.e., 1 ml of H₂O weighing 1 gm at 4 °C).

Male: 1.052-1.063

Female: 1.050-1.058 (i.e., 1 ml of whole blood weighing 1.060 gm).

Osmolarity= 300 mOsm or 0.3 Osm, reflects the concentration of solutes in the plasma.

Salinity= 0.85%, reflects the concentration of NaCl in the blood.