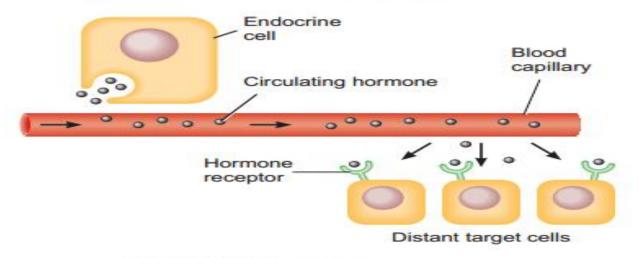
Introduction to Biology

Alekh N Sahu Assistant Professor Department of Pharmaceutics IIT (BHU), Varanasi-221005 ansahu.phe@iitbhu.ac.in The levels of structural organization are chemical, cellular, tissue, organ, system, and organismal. CELLULAR LEVEL 1 CHEMICAL LEVEL TISSUE LEVEL Smooth muscle cell Atoms (C, H, O, N, P) Smooth muscle tissue Molecule (DNA) 5 SYSTEM LEVEL Serous membrane Pharynx ORGAN LEVEL Esophagus Smooth muscle tissue layers Liver Stomach **Epithelial** Stomach tissue Pancreas Gallbladder Small intestine Large intestine Digestive system

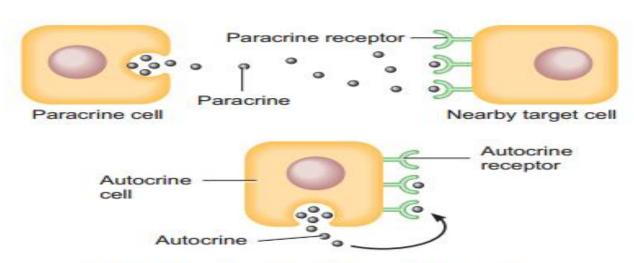
6 ORGANISMAL LEVEL



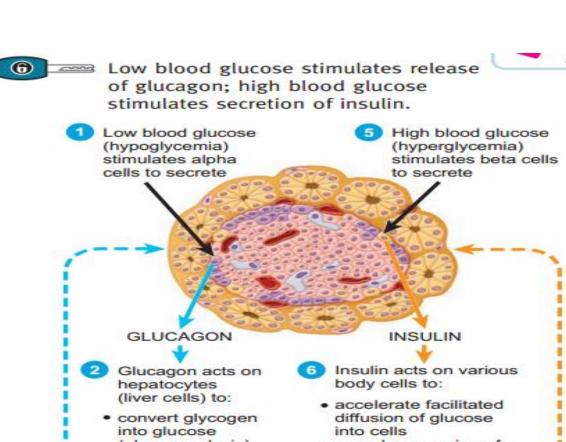
(f) Circulating hormones are carried through the bloodstream to act on distant target cells. Paracrines act on neighboring cells and autocrines act on the same cell that produced them.



(a) Circulating hormones



(b) Local hormones (paracrines and autocrines)

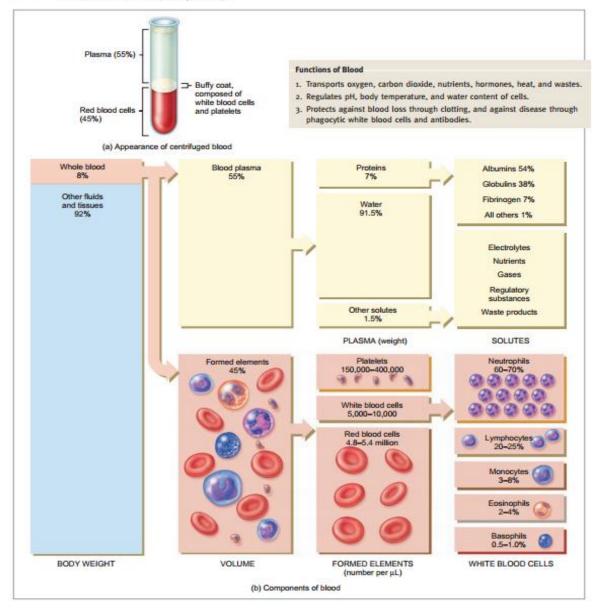


- (glycogenolysis)
- form glucose from lactic acid and certain amino acids (gluconeogenesis)
- Glucose released by hepatocytes raises blood glucose level to normal
- speed conversion of glucose into glycogen (glycogenesis)
- increase uptake of amino acids and increase protein synthesis
- speed synthesis of fatty acids (lipogenesis)
- slow glycogenolysis
- slow gluconeogenesis
- Blood glucose level falls
- If blood glucose continues to rise, hyperglycemia inhibits release of glucagon
- If blood glucose continues to fall, hypoglycemia inhibits release of insulin

Composition of Blood



Blood is a connective tissue that consists of blood plasma (liquid) plus formed elements (red blood cells, white blood cells, and platelets).



pH Values of Selected Substances	
SUBSTANCE	pH VALUE
Gastric juice (found in the stomach)	1.2-3.0
Lemon juice	2.3
Vinegar	3.0
Carbonated soft drink	3.0-3.5
Orange juice	3.5
Vaginal fluid	3.5-4.5
Tomato juice	4.2
Coffee	5.0
• Urine	4.6-8.0
Saliva	6.35-6.85
Milk	6.8
Distilled (pure) water	7.0
• Blood	7.35-7.45
Semen (fluid containing sperm)	7.20-7.60
 Cerebrospinal fluid (fluid associated with nervous system) 	7.4
 Pancreatic juice (digestive juice of the pancreas) 	7.1-8.2
Bile (liver secretion that aids fat digestion)	7.6-8.6
Milk of magnesia	10.5
Lye (sodium hydroxide)	14.0

Denotes substances in the human body.

THANKS