CLASSIFICATION OF LIPIDS

1. Simple lipids

- contain glycerol and fatty acids
- alcohol esters of fatty acids
- Examples: fats, oils and waxes

2. Complex lipids

- simple lipids plus other substances

Examples: phospholipids and cerebrosides

- A. Lipoproteins with protein
- B. Glycolipids with carbohydrates
- C. Phospholipids with phosphoric acid

3. Steroids

- solid alcohols which are not chemically related to fat but they are included among lipids because they exhibit-fat like properties

Examples: sex hormones, adreno-cortical hormones, vit. D, bile acids and cholesterol (common component of membranes of eukaryotic cells)

THREE MAJOR TYPES OF LIPIDS EXIST IN PROTOPLASM

1. Triglycerides

- fatty acids (3 hydrocarbon chains) when bounded through their glycerol become neutral fats

- that provides insulation and energy reserves

- fundamental to formation of coll more nteriocking rings

3. Steroid - com atoms

PROTEINS

- 15% of the protoplasm
- Most abundant constituent of the protoplasm
- C,H,O,N with sulfur, phosphorus and iodine
- Colloidal in nature
- Components of amino acids
- Chief structural pattern of protoplasm form enzymes, hormones, chromosomes and cell components

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TYPES OF PROTEINS

1. Fibrous protein – polypeptides are arranged parallel along a single axis to produce long fibers or sheets

- a. Keratin principal components of hair
- b. Silk pleated sheet protein produced by silk moths and spiders

2. Globular proteins - the polypeptides are so tightly folded into spherical or globular shapes, such as hemoglobin, the component of vertebrate blood used to transport oxygen

3. Conjugated protein – simple proteins in union with other substances

- a. Nucleoprotein with nucleic acids e.g. histones
- b. Glycoproteins with carbohydrates e.g. mucin
- c. Lipoprotein with fatty acids e.g. serum ad brain tissue
- d. Chromoproteins with pigments e.g. cytochrome

PROTOPLASMIC PROTEINS IN LIVING BODIES A. Enzymes as Proteins

- most of the proteins in the body cells are enzymes
- catalysts that control the rates of many chemical reactions such as respiration, digestion, muscle contraction, nerve conduction and other metabolic processes

SIX MAIN GENERAL GROUPS ACCORDING TO CHEMICAL **REACTIONS THEY PERFORM**

- 1. Oxido-reductases oxidation-reduction reactions
- 2. Transferases transfer of groups
- 3. Hydrolases hydrolytic reactions
- 4. Lyases addition or removal of a group to and form double bonds
- 5. Isomerases catalyze isomerization
- 6. Ligases or synthetase concerse 2 molecules by splitting a phosphate Lo
- two fatty acids linked by a glycerol molecule to phosphere containing water-soluble components fundamental to formation of this
 - 1. number sontacts or collision between molecules of the

 - 2. Temperature
 - increase rate of collision with substrate thus speed up reaction
 - optimum temperature is generally the body temperature
 - 3. pH concentration the highest activity of the enzymes is at optimum pH
 - 4. relative concentration of the enzymes and substrate

Nucleic Acids

- In DNA, purines are adenine and guanine; pyrimidines are cytosine and thymine
- In RNA, thymine is replaced by uracil