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Diploma in Pharmacy 2nd Year
Biochemistry & Clinical Pathology
Chapter 1 : Introduction to Biochemistry

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Chapter 1
Introduction to Biochemistry

- → ***Bio :*** living organisms
- → ***Chemistry :*** chemistry
- → Also called as chemistry of life/ living cells.
- → Biochemistry involves the study of chemistry of life.
- → The term biochemistry was introduced by Carl Neuberg in 1903.
- → Which specialies in the chemical process and chemical transformation in living organisms.
- → It lies between Biology and Chemistry that studies complex chemical rnx chemical structure giving rise to life.
- → It deals with chemical basis of life in plants and animals.
- → It relis on basic laws of chemistry.
- → Like growth, reproduction, metabolism, response towards stimuli etc.

Defination

- ➢ The chemistry of life.
- ➢ The science concerned with the chemical basis of life.
- ➢ The science concerned with the various molecular that occurs in living cells and organisms and their chemistry reaction.

Scope of bio chemistry in pharmacy

Various scope of Biochemistry

- Bio-Chemical Test
- The Half-life
- Drug Constitution
- Drug Storage
- Drug Metabolism

- ⇨ **Bio-Chemical Test :** These tests help fix the specific half life or date of expiring of drugs.
- ⇨ **The half life :** This is a test done on Bio-Chemical drugs to know how long a drug is stable when kept at so & So Temperature.
- ⇨ **Drug Constitution :** Bio Chemistry gives an idea of the constitution of the drug.
    - It chance of dehydration with varry into Temperature etc.
    - How modification in the medicinal chemistry helps to improve efficiency minimize the side effects.

- **Drug Storage :** The storage condition required can be estimated by the Bio-Chemical Test for example many enzymes.
  - Hormones are stored for dispensing.
  - These get deteriorated over time due to temperature or oxidation contamination & also due to improve storage.
- **Drug Metabolism :** It gives an idea of how drug molecules are metabolised by many biochemical reaction in the presence of enzymes.
  - This helps to avoid drug which have a poor metabolism.

Cell and its Biochemical Organisation

- A cell is the basic living structural and functional unit of body enclosed with membrane.
- Life consists of various complex lifeless chemical molecules.
- Like protein nucleic acid (DNA & RNA) Polysaccharides etc.
- **Example :** e.coli the unicellular bacterium has around 6000 types of organic compounds and a complex organisms like human contain around 100000 types of molecules how ever only few of them are recognized.

Complex molecules

- Small organic compounds such as aminoacids, nucleotides & monosaccharides function such as the monomeric units building blocks.

Major complex Biomolecules of cells

Biomolecules	Building Blocks (monomer units)	Major functions
Protein	Aminoacids	Form basic structure & function frame work of cell
DNA (Deoxyribonulic Acid)	Deoxyribonucleotides	Carries of hereditary information
RNA (Ribonuclic Acid)	Ribonuclotides	Carrying information regarding protein biosynthesis
Polysaccharides Glycogen	Monosaccharides (glucose)	Body stores energy in this form & utilise it to meet short term demand
Lipids	Fatty Acids Glycerol	Second major source of energy

Micromolecules

- → Micromolecules are small organic molecules present in the cystol of a living cells.
- → No of there molecules in a cell is around 100-200.
- → Some common examples of micromolecules Aminoacids, nucleotides, sugar, & their phosphorilated derivatives.
- → Most of there molecules are water soluble, polar are charged and present in micromolar to millimetre concentration.

Macromolecules

- → The macromolecules have large molecular weight and are formed by polymerization of monomer units.
- → Example polysaccharides (starch) are formed by polymerization of monosaccharides units.
- → **Protein :** are formed by polymerization of aminoacids.
- → **Lipids :** are formed by polymerization of fatty acids.
- → **DNA & RNA :** are formed by polymerization of nucleotides units.

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