D.PHARM • SECOND YEAR

Biochemistry & Clinical Pathology

CHAPTER 1

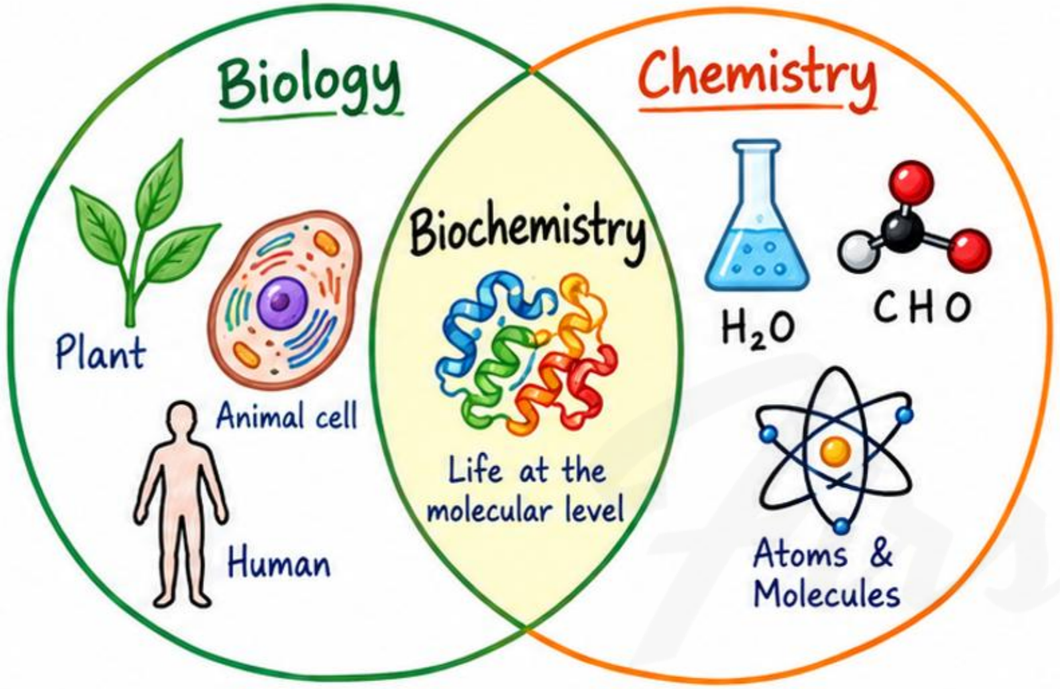
Introduction to Biochemistry



ENGLISH CHAPTER NOTES

DIPLOMA IN PHARMACY

DEFINITION, SCOPE & IMPORTANCE



WHAT IS BIOCHEMISTRY?

- Biochemistry is the branch of science that studies the chemical substances and chemical processes occurring within living organisms.
- It connects Biology with Chemistry and helps us understand life at the molecular level.

SCOPE & IMPORTANCE

- It explains how biomolecules produce and control processes within and between living cells.
- It gives the molecular basis of normal body function and disease.
- It is important in medicine, genetics, agriculture and biotechnology.

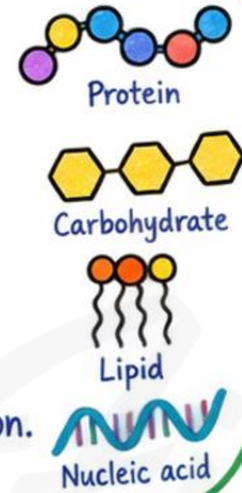
Significance of Biochemistry



MAJOR AREAS OF BIOCHEMISTRY

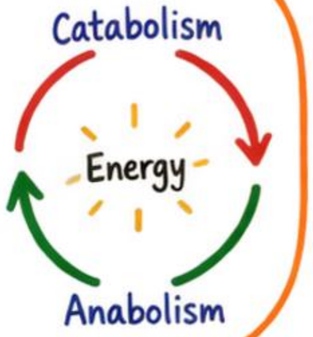
1. BIOMOLECULES

- Proteins: enzymes, structure and signalling.
- Carbohydrates: energy and structure.
- Lipids: membranes and energy storage.
- Nucleic acids: genetic information.



2. METABOLISM

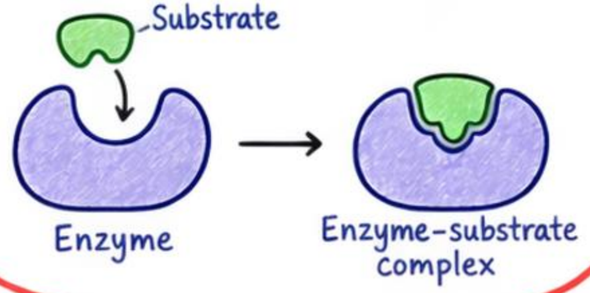
- Catabolism releases energy.
- Anabolism synthesizes biomolecules.



BIOCHEMISTRY

3. ENZYMOLOGY

- Study of enzyme structure, mechanism, kinetics and regulation.



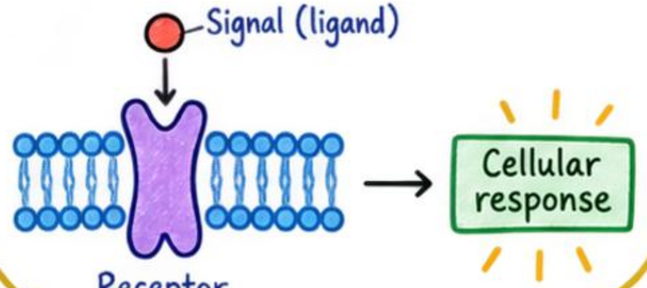
4. GENETICS & MOLECULAR BIOLOGY

- DNA, RNA, gene expression, regulation and inheritance.



5. SIGNAL TRANSDUCTION

- How cells detect, process and respond to signals.

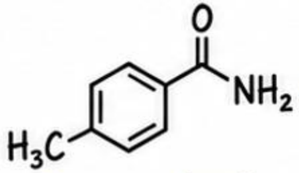


BIOCHEMISTRY IN PHARMACY

1 DRUG DESIGN & DEVELOPMENT

Explains drug interaction with enzymes, receptors and DNA; supports structure–activity relationship (SAR).

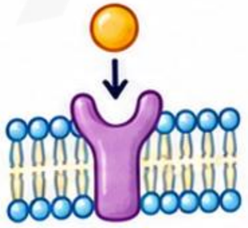




Drug molecule (small molecule)

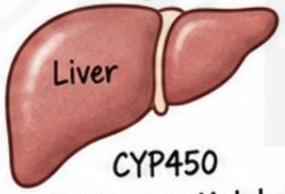
2 PHARMACODYNAMICS

What the drug does to the body through biochemical pathways.



3 PHARMACOKINETICS

What the body does to the drug, including metabolism by liver enzymes.



CYP450

Drug ⟶ Metabolite

Inhibitor



4 ENZYME INHIBITION

Many drugs inhibit enzymes; example: ACE inhibitors in hypertension.

5 DISEASE & CLINICAL BIOCHEMISTRY

Explains altered pathways and uses biomarkers such as blood glucose, cholesterol, liver and kidney tests.



6 BIOTECHNOLOGY

Basis of genetic engineering, recombinant DNA technology and biopharmaceuticals.





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