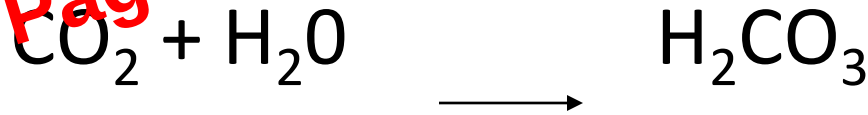


THEY ALL NEED ENERGY!

- Assemble of macromolecules from raw materials
- Production and excretion of waste products
- Flow of genetic instruction (from nucleus to cytoplasm)

ENZYMES

Preview from Notesale.co.uk
Page 18 of 64



- In the presence of carbonic anhydrase (enzyme found in red blood cells), the reaction is 10^7 more rapid

ENZYMES

- Highly specific in the reactants they can bind and the reaction they can catalyze
- The reactants = substrates

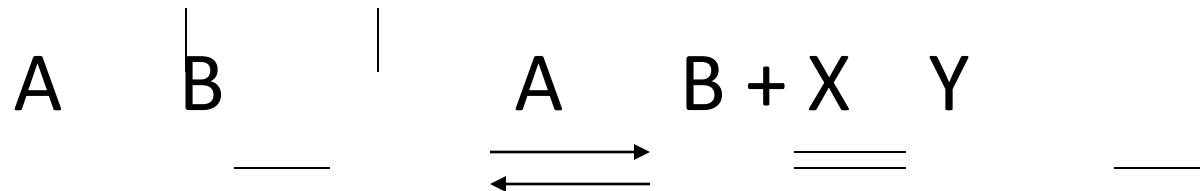
ENZYMES

- Enzymes cause their substrates (reactants) to be very reactive without having to be raised to particularly high energy levels
 - enzymes catalyze reactions by decreasing the magnitude of the activation energy barrier

LYASES

- Catalyze the removal of a group to form a double bond or the addition of a group to a double bond

X Y

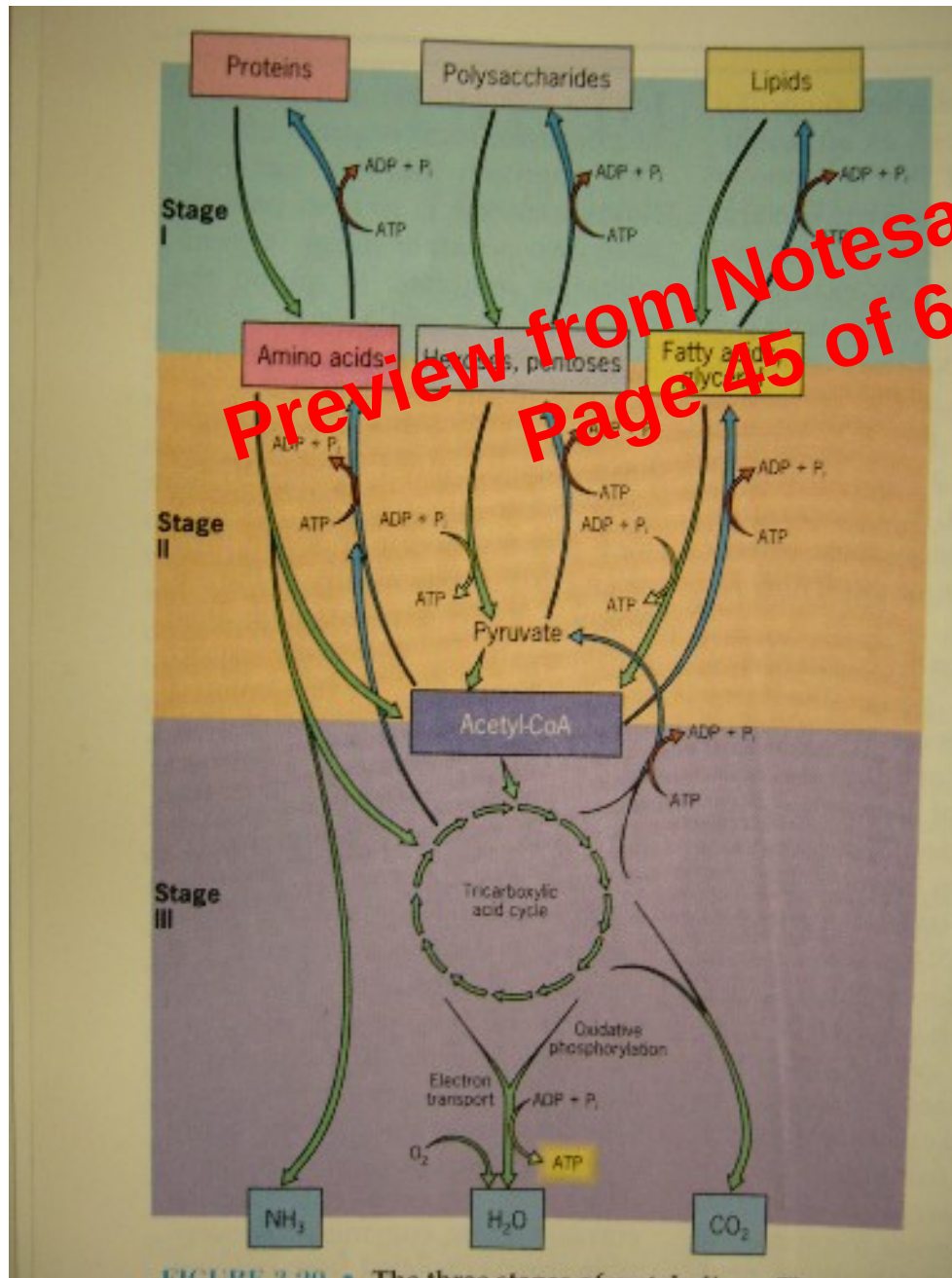


THE PROPERTIES OF ENZYMES

- Present in small amounts
- Not altered irreversibly during the course of the reaction; each enzyme molecule can participate in many individual reactions

CATABOLIC PATHWAYS

- Lead to the disassembly of more complex molecules to form simpler products
- 2 functions
 - make available the raw materials from which other molecules can be synthesized
 - provide a chemical energy required for many activities of a cell



The three stages of metabolism. The catabolic pathways (arrows downward) converge to form common metabolites and lead to ATP synthesis in stage III. The anabolic pathways (arrows upward) start from a few precursors in stage III and utilize ATP to synthesize a large variety of cellular materials

METABOLIC REGULATION

- Energy balancing (energy-releasing reactions)
 - controlling the activities of certain key enzymes in a number of metabolic pathways
 - altering the shape of the active site
 - covalent modification
 - allosteric modulation
- } regulate glucose oxidation

ALLOSTERIC MODULATION

- Illustrates the intimate relationship between molecular structure and function
 - very small changes in the structure of the enzyme induced by allosteric modulator can cause marked change in enzyme activity