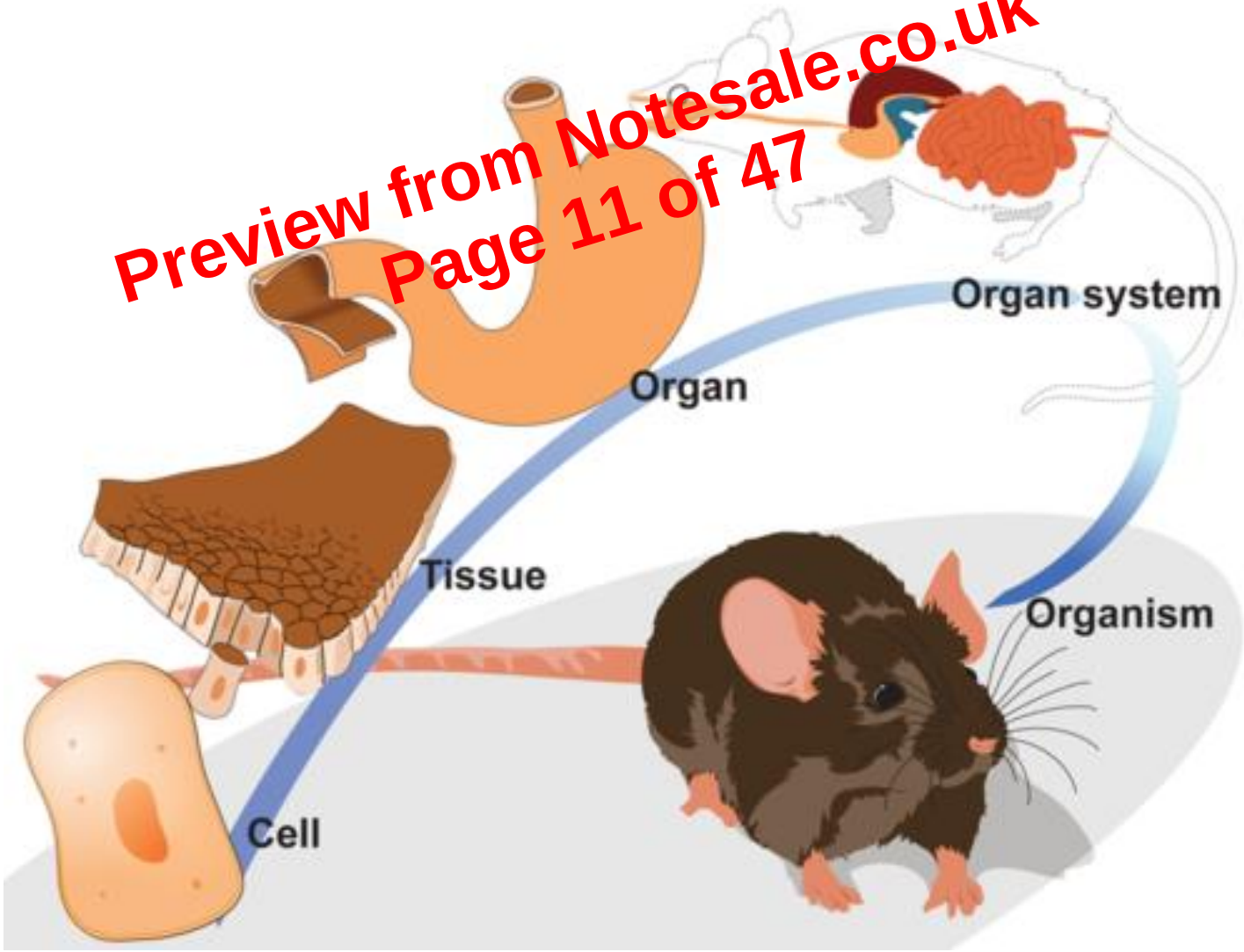
Study of :

- the structure and functions of biomolecules

- interaction of these molecules to form cells tissues and whole organisms

Levels of Organisation

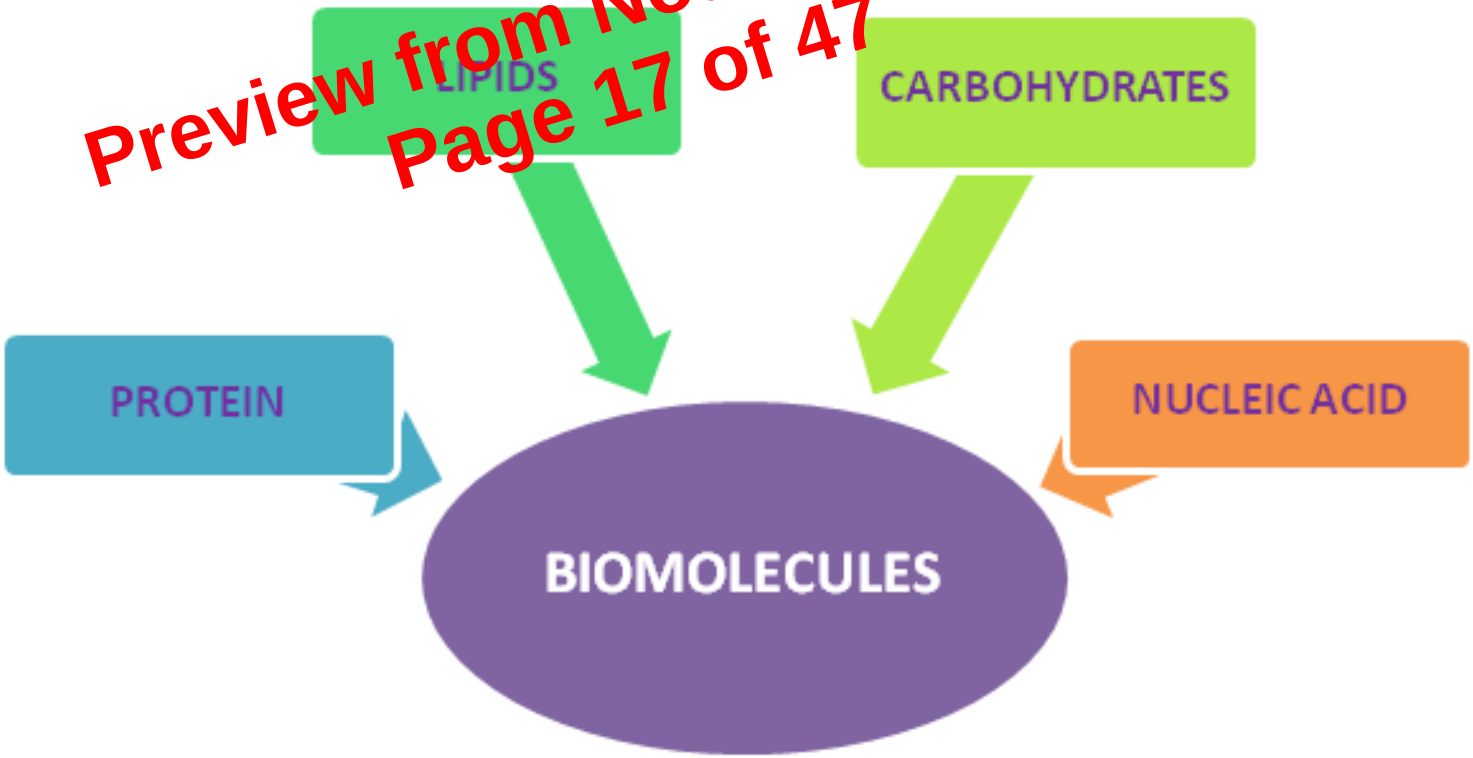


Functional Groups

- Groups of other atoms that are attached to the carbon backbone
- Determine the chemical properties / diversity of the biomolecules

an alkene	$CH_3CH=CH_2$
an alcohol	CH_3CH_2OH
an ether	CH_3OCH_3
an amine	$(CH_3)_2NH$
a thiol	CH_3CH_2SH
an aldehyde	$CH_3\overset{\overset{O}{\|}}{C}H$
a ketone	$CH_3\overset{\overset{O}{\|}}{C}CH_3$
a carboxylic acid	$CH_3\overset{\overset{O}{\|}}{C}OH$
a carboxylic e ster	$CH_3\overset{\overset{O}{\|}}{C}OCH_3$
an amide	$CH_3\overset{\overset{O}{\|}}{C}NH_2$
a phosphoric ester	$HO\text{-}\overset{\overset{O}{\|}}{\underset{\underset{OH}{\|}}{P}}\text{-}OCH_3$
a phosphoric acid anhydride	$HO\text{-}\overset{\overset{O}{\|}}{\underset{\underset{OH}{\|}}{P}}\text{-}O\text{-}\overset{\overset{O}{\|}}{\underset{\underset{OH}{\|}}{P}}\text{-}OH$

Biomolecules



Biomolecules

Biomolecule	Monomer	Examples	Major Functions
Protein	Amino acid	Enzymes, Hemoglobin	Structure and function of cells
Nucleic Acids	Nucleotide	DNA /RNA	information
Carbohydrates	Monosaccharide	Starch Cellulose	Energy storage
Lipids	Fatty acids	Cholesterol Sex hormones	Energy storage

Carbohydrates

- Most abundantly found in nature
- Main source of energy
- Initially synthesised in plants during photosynthesis
- The basic unit is a monosaccharide and it forms larger molecules like glycogen, starch and cellulose

Plant vs Animal Cell

Plant	Animal
Cell wall present	No cell wall
One large central vacuole	One or more small vacuoles
Chloroplasts present	No chloroplasts
Fixed shape	Irregular shape
Lysosomes are rare	Lysosomes are present
Nucleus lies on one side of the cytoplasm	Nucleus usually lie in the center of the cytoplasm