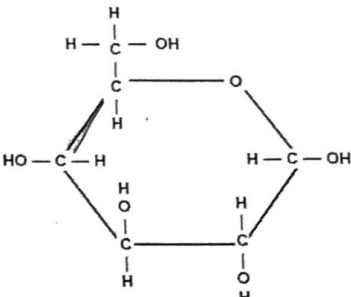


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ORGANIC MOLECULES NOTESCarbohydrates

Chemical formulae

Molecular Formula	Empirical formula	Structural Formula**recognize it
$C_6H_{12}O_6$	CH_2O	 <p>Has a ring structure</p>

Composition and uses

Elements Present	Used by organisms for		Building Blocks
Carbon Hydrogen Oxygen H:O = 2:1 Always !!	<u>Energy</u> See starch and glycogen below	<u>Structure</u> See Chitin and cellulose below	<u>Monosaccharides</u> (simple sugars Ex: glucose THIS IS THE BODIES quick cheap energy supply

Examples & Functions / Related terms & info

Disaccharide = 2 connected monosaccharidesPolysaccharide = 3 or more connected monosaccharides

- Starch – polysaccharide stored in plants used as energy reserve
- Glycogen - animal equivalent to starch used for energy reserve and stored in liver.
- Chitin – makes up the exoskeleton (provides support) of arthropods which are invertebrates.
- Cellulose – makes up the cell walls of plant cells (provide support and structure to cell)

Names of carbohydrates usually end in -ose ex: glucose, fructose, sucrose, galactose, lactoseIndicatorsLugols iodine solution turns from amber to bluish black when starch is present.Benedicts solution turns from blue to brick red when glucose is present with the addition of heat.

Lipids

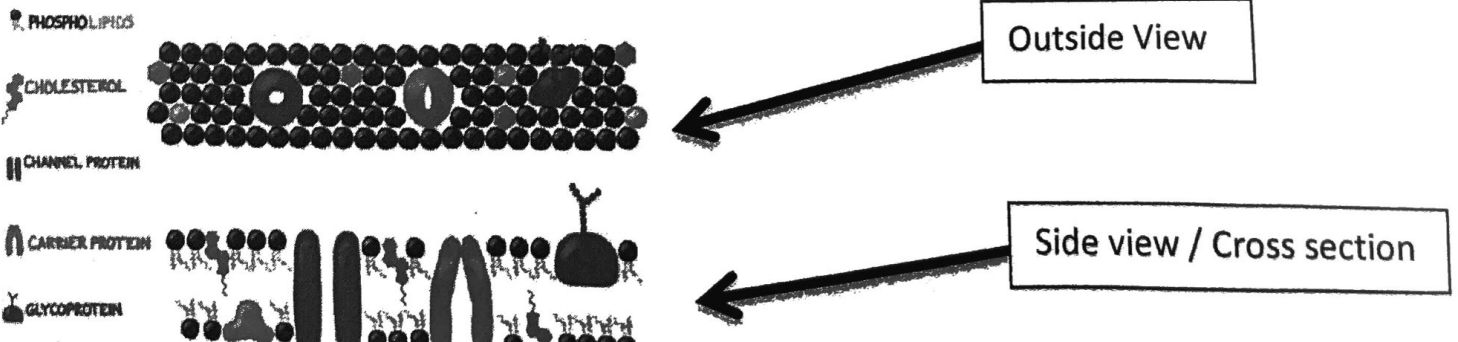
Composition and uses

Elements Present	Used by organisms for		Types of Fats
Carbon Hydrogen Oxygen NO SPECIFIC RATIO OF H:O	Stored energy See types of fats	Structure Importance of cell membrane	Saturated fats All <u>single bonds</u> C-C <u>Straight chain</u> Solid at room temperature FATS Mostly animals Unsaturated Fats Some <u>double</u> C=C bonds or triple bonds <u>Bent chain</u> Liquids at room temp OILS Mostly plant Cholesterol C ₂₇ H ₄₆ O Component of <u>cell membrane</u> and <u>hormones</u> Triglycerides – <u>calories not used</u> right away converted to this for <u>storage</u> in fat cells
Building Blocks Of Lipids	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">Carboxyl Group = COOH</div>		
3 fatty acids			

Uses explained

THE CELL MEMBRANE = fluid mosaic = selectively permeable
 Having the right amount of lipids aka "The Fat goldilocks theory"
 Combination of multiple types of fats each has role in how fluid/open the gaps in the cell membrane are.
 Saturated fats = tightly bonded TOO MUCH: Low fluidity TOO LITTLE: High fluidity
 Unsaturated fats = bent molecules TOO MUCH: High fluid TOO LITTLE: low fluidity
 Cholesterol = very large & takes up space TOO MUCH: "clogged" TOO LITTLE: high fluid
 BUT JUST RIGHT= combination of the three types of fats that results in enough "gaps" to allow for smaller crucial molecules (ie glucose and water) to pass through but not larger bulky molecules (ie starch) selectively permeable - only some molecules can pass through.

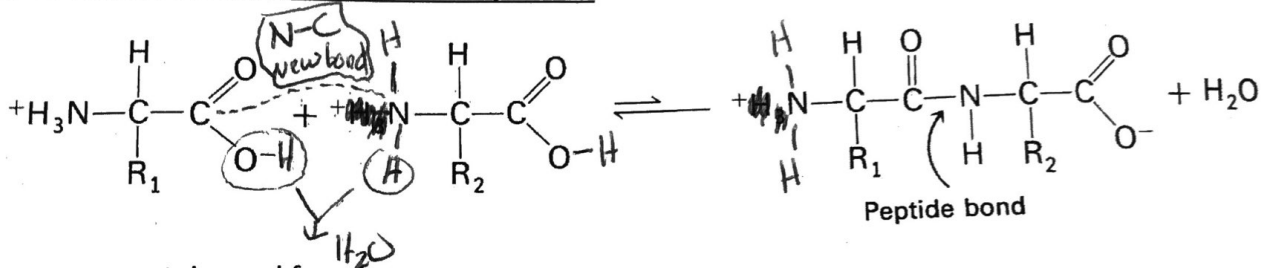
THE FLUID MOSAIC MODEL of Cell membrane



Proteins

Elements Present	Used by organisms for	Related Terms & Info
Carbon Hydrogen Oxygen NITROGEN	Structure and movement (muscles) Enzymes Antibodies Hormones Pigments	Peptide bond- bond between 2 Amino Acids Dipeptide – 2 amino acids bonded Polypeptide = long chain of AA bonded
Building Block= Amino Acids (AA)		
R= Side chain.. varies among amino acids		
<p style="text-align: center;">*Amino group Carboxyl group</p>		

Making Proteins ... Dehydration Synthesis



Important proteins and functions:

Enzymes- speed up chemical reactions (more later)

Antibodies – natural immune system in body

Hormones – chemical signals that affect activity in separate area of body

Muscle and Movement – component of all tissues and organs, provides higher and more sustained energy

*** Shape of the protein → Determines Function See next page

Other Information:

NON-POLAR					+ CHARGE	
Glycine (Gly / G)	Alanine (Ala / A)	Valine (Val / V)	Cysteine (Cys / C)	Proline (Pro / P)	Lysine (Lys / K)	Arginine (Arg / R)
Leucine (Leu / L)	Isoleucine (Ile / I)	Methionine (Met / M)	Tryptophan (Trp / W)	Phenylalanine (Phe / F)	Histidine (His / H)	
POLAR					- CHARGE	
Serine (Ser / S)	Threonine (Thr / T)	Tyrosine (Tyr / Y)	Asparagine (Asn / N)	Glutamine (Gln / Q)	Aspartic Acid (Asp / D)	Glutamic Acid (Glu / E)

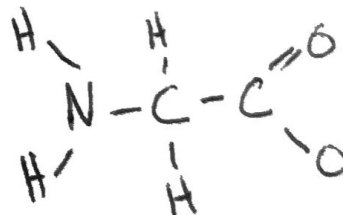
20 Amino Acids

9 essential amino acids = cannot be made by body.. must be ingested.

Facts about proteins
largest = titan

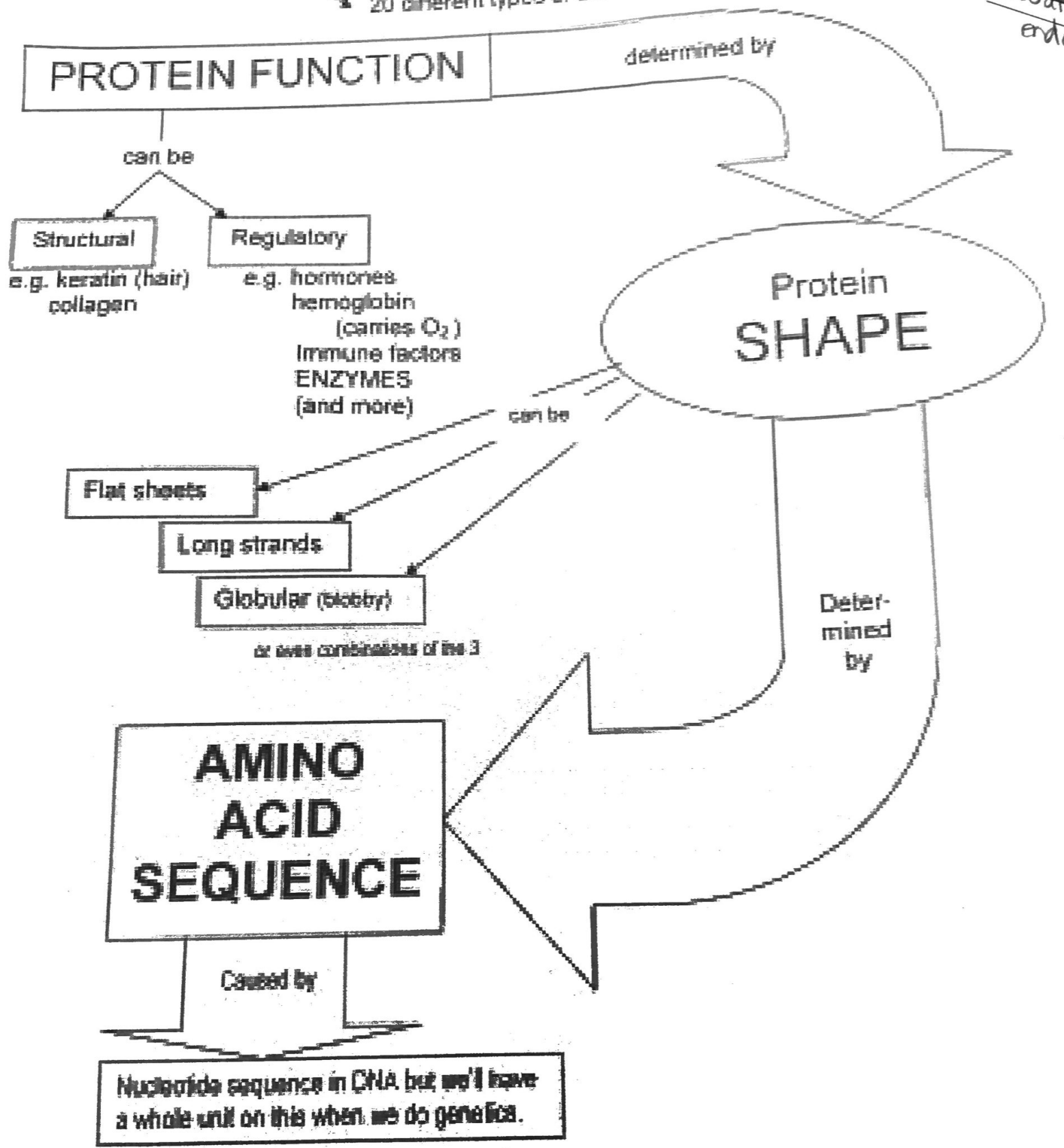
27,000 AA

Smallest Glycine

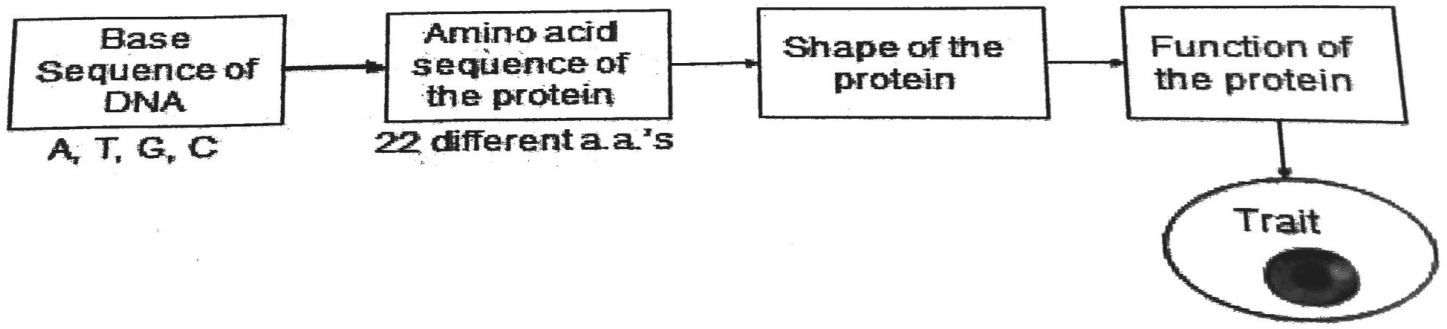


Protein = chain of amino acids

20 different types of amino acids



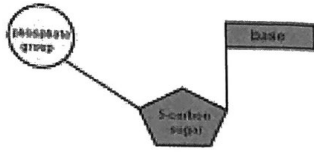
toward end of unit storage



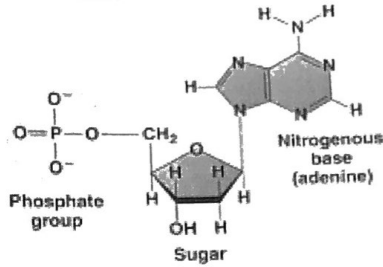
Nucleic Acids

Building block= nucleotides

Basic Nucleotide Structure



General Structure



Structure of Adenine

Two Types:

	DNA	RNA
Full Name	Deoxyribonucleic acid	Ribonucleic acid
Basic Structure	2 long twisting strands of nucleotides in the form of a "double helix"	1 Single strand of nucleotides
Nucleotide sugar	deoxyribose	Ribose
Notrogenous bases	Guanine (G) Cytosine (C) Adenine (A) Thymine (T)	Guanine (G) Cytosine (C) Adenine (A) Uracil (U)
Location in cell	Nucleus (the chromosomes)	Cytoplasm and ribosomes
Function	<u>Hereditary material, directs and controls activities</u>	<u>Protein synthesis</u>

