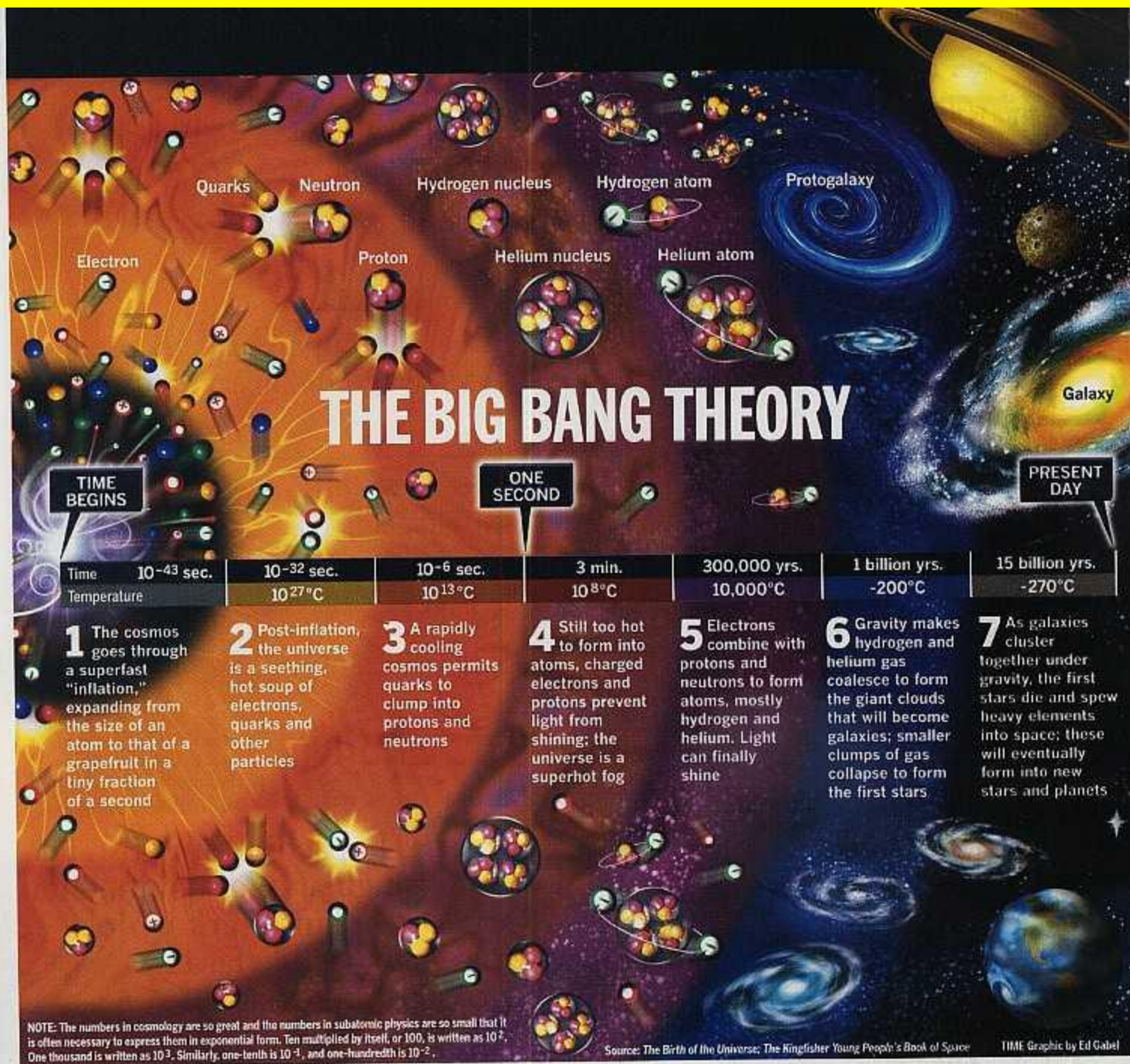


THE AMAZING BIOMOLECULES WHICH MAKE LIFE

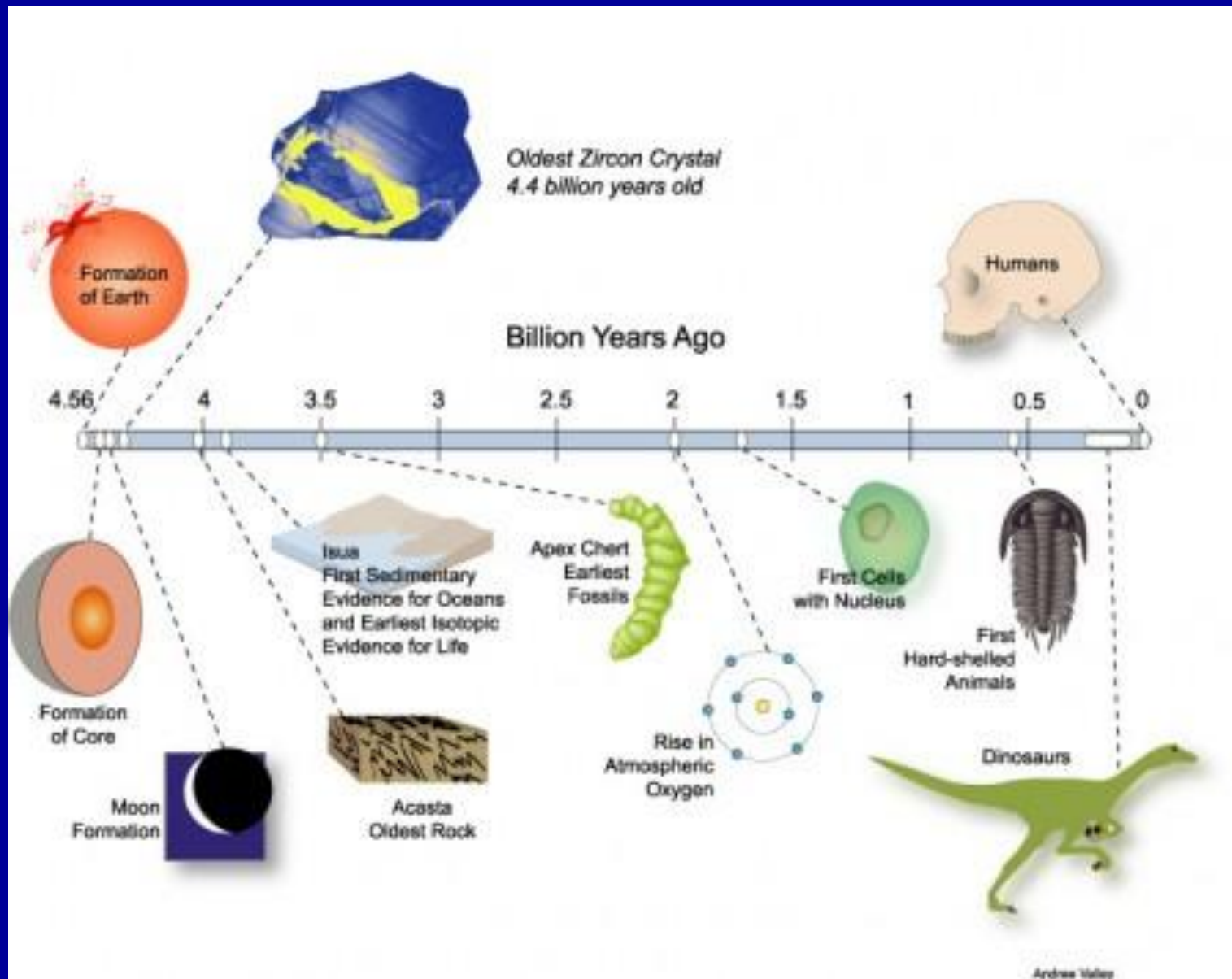
Prof Syed Ibrahim Rizvi
Department of Biochemistry
University of Allahabad
Allahabad

E Mail: sirizvi@gmail.com

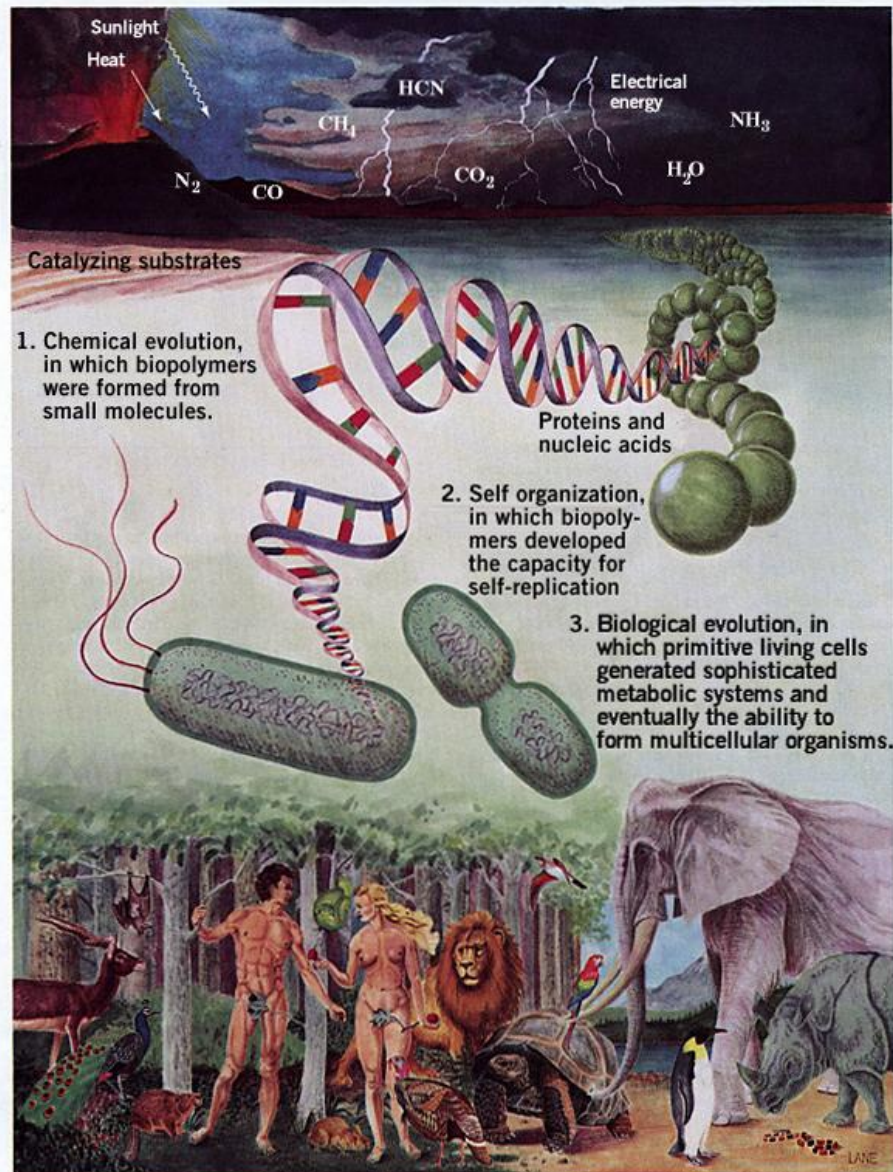
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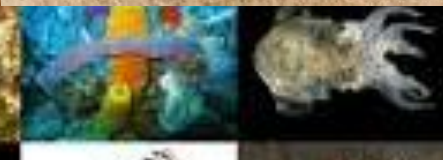


Origin of earth: The time line



Origin of life

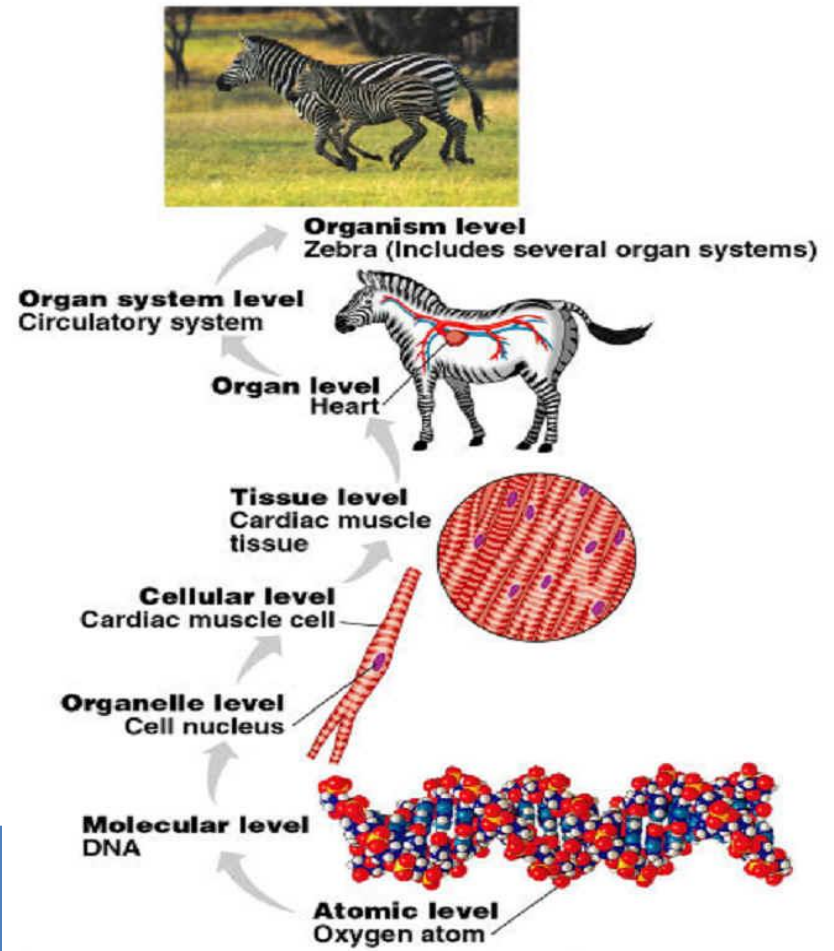




Organization of Life

- Entire organism
- System
- Tissue
- Cells
- Organelle
- Molecules
- Atoms

Molecular/atoms lowest level of organization



Life shows amazing diversity.....



BUT GREAT CHEMICAL UNITY.....

BIOMOLECULES: Nucleic acid, Proteins, Carbohydrates, and Lipids

Why did nature select only a few BIOMOLECULES

(Nucleic acid, Protein, Lipids and Carbohydrates)

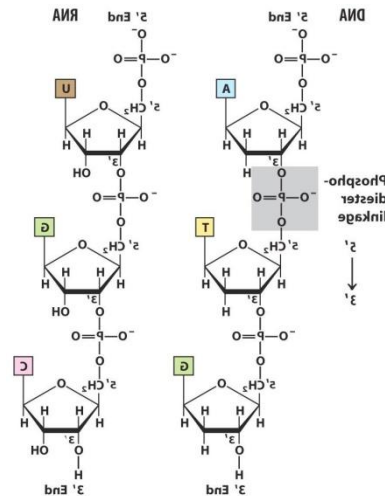
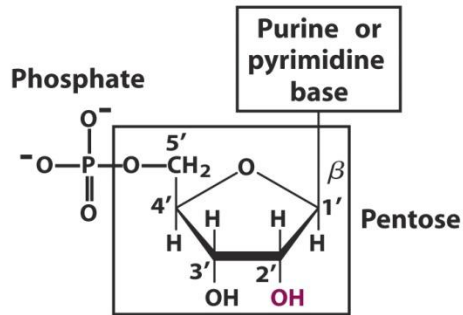
To be the BUILDING BLOCKS OF LIFE ?



Nucleic acid, Protein, Lipids and Carbohydrates

amazing properties

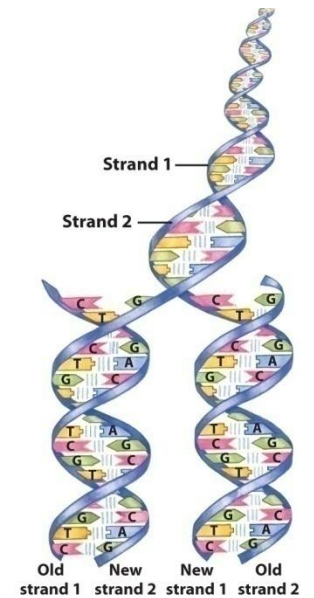
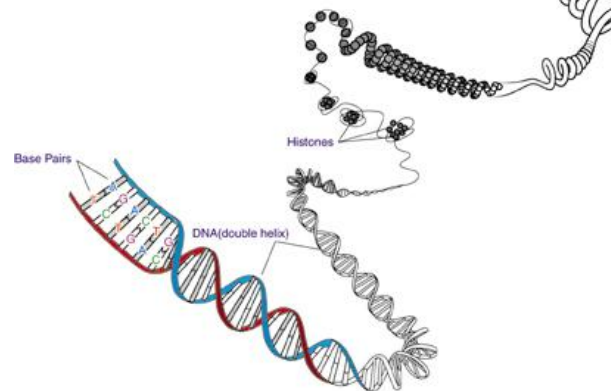
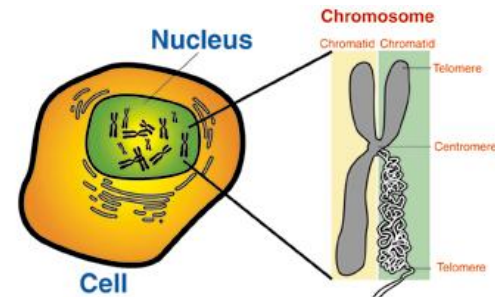
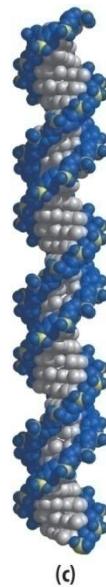
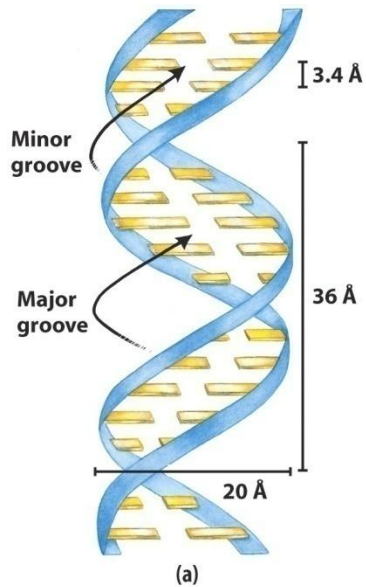
Nucleic acids



James D. Watson



Francis Crick,
1916–2004





Prof Har Gobind Khorana

Genetic Code- Table

		Second Letter					
		U	C	A	G		
1st letter	U	UUU Phe UUC UUA Leu UUG	UCU UCC Ser UCA UCG	UAU Tyr UAC UAA Stop UAG Stop	UGU Cys UGC UGA Stop UGG Trp	U C A G	3rd lette
	C	CUU CUC Leu CUA CUG	CCU CCC Pro CCA CCG	CAU His CAC CAA Gln CAG	CGU CGC Arg CGA CGG	U C A G	
	A	AUU AUC Ile AUA AUG Met	ACU ACC Thr ACA ACG	AAU Asn AAC AAA Lys AAG	AGU Ser AGC AGA Arg AGG	U C A G	
	G	GUU GUC Val GUA GUG	GCU GCC Ala GCA GCG	GAU Asp GAC GAA Glu GAG	GGU GGC Gly GGA GGG	U C A G	

Downloaded from For Medicine

Prof H G Khorana (Nobel Prize in 1968
with Holley and Nirenberg)

PROTEINS

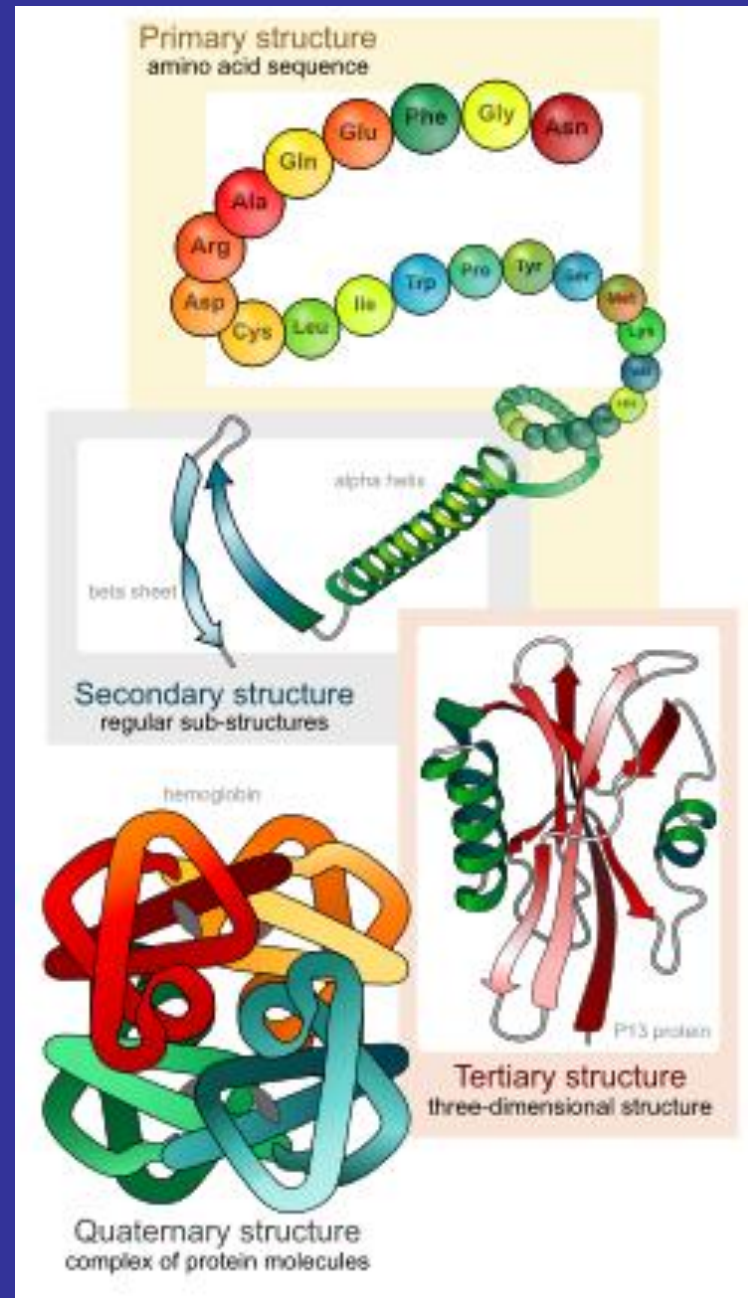
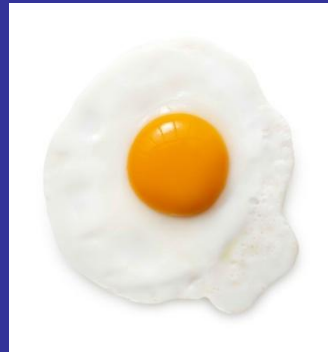
Functions of proteins

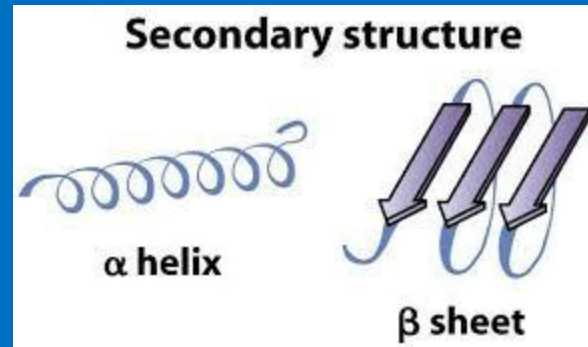
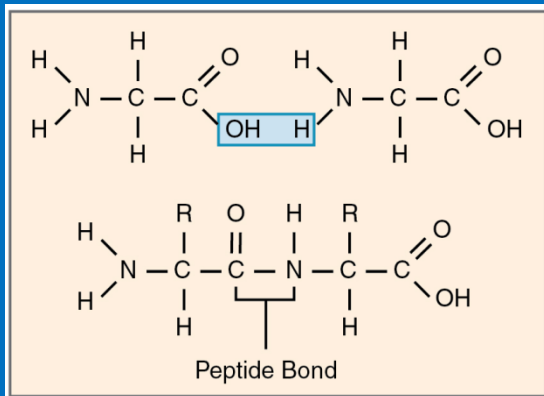
Enzymes
Transport
Protective
Storage
Hormones
Toxins
Receptors

Native

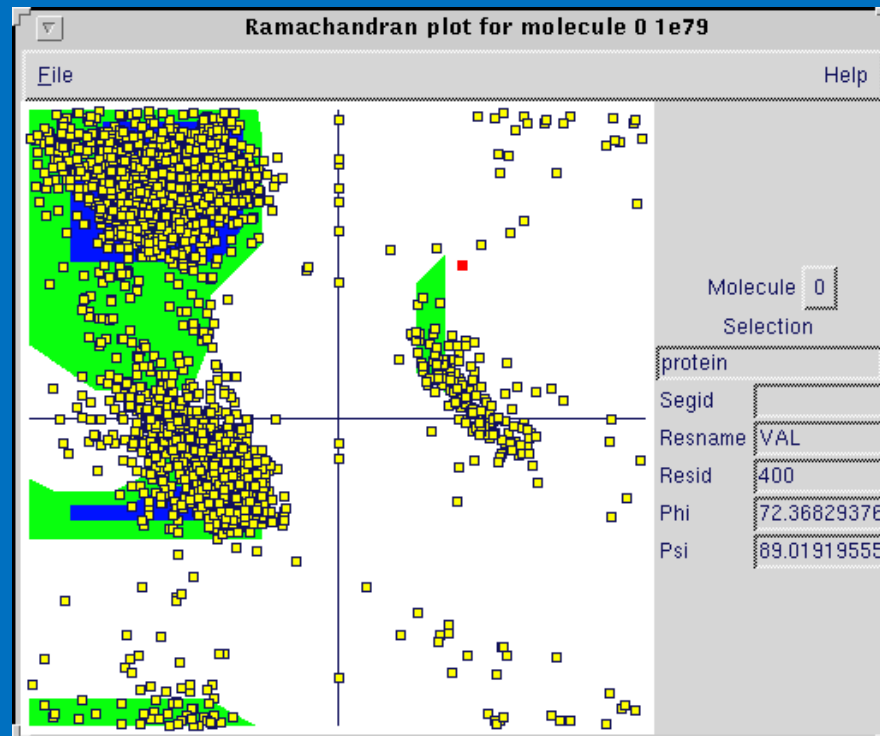


Denatured





G N Ramachandran



RAMACHANDRAN PLOT

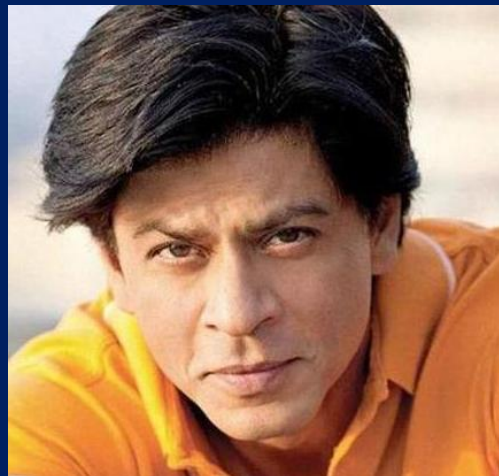
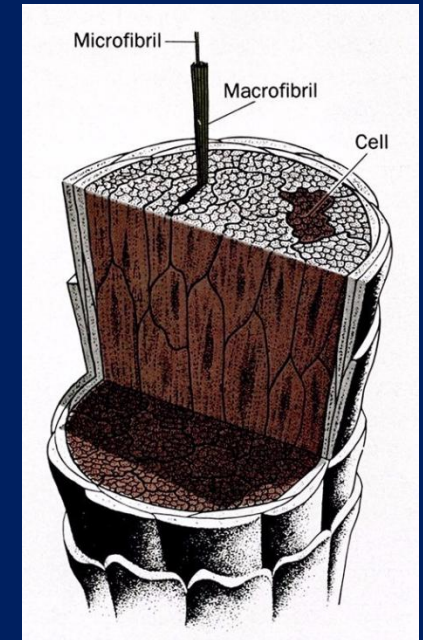
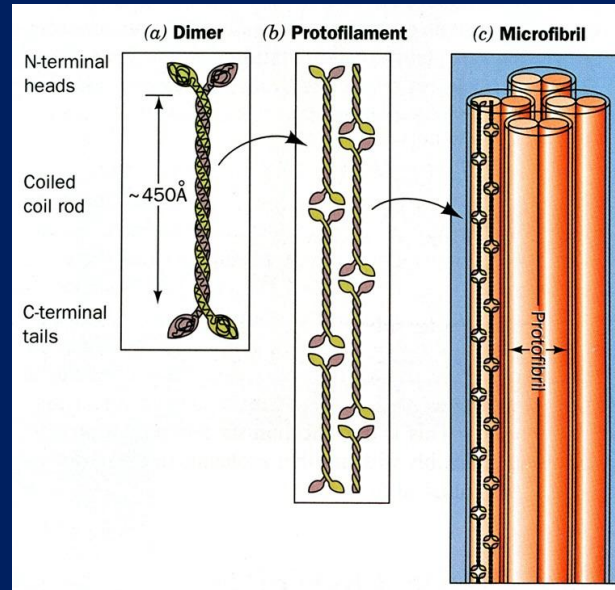
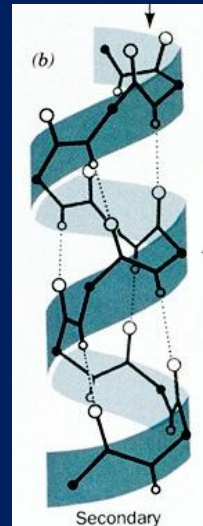
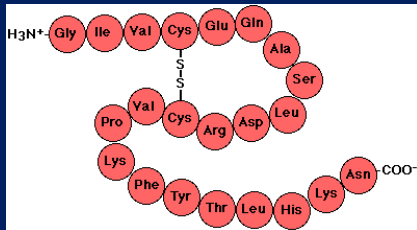
STRUCTURE OF HAIR

1

2

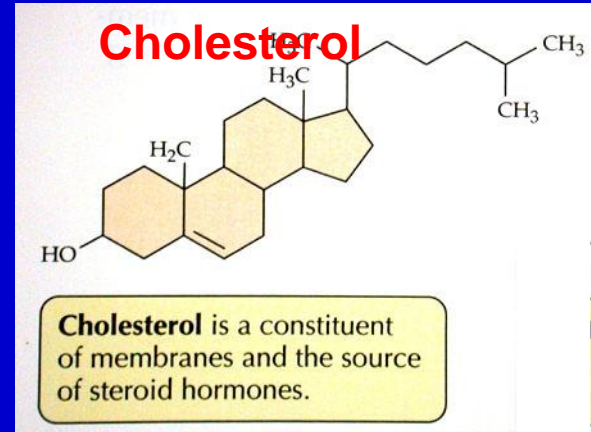
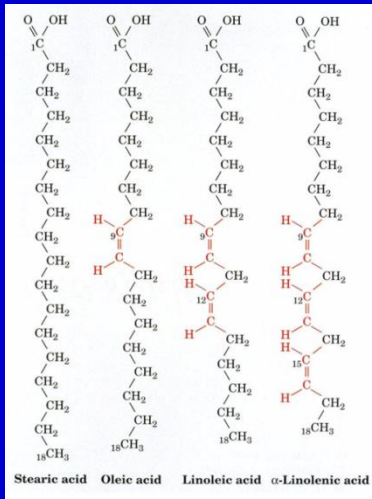
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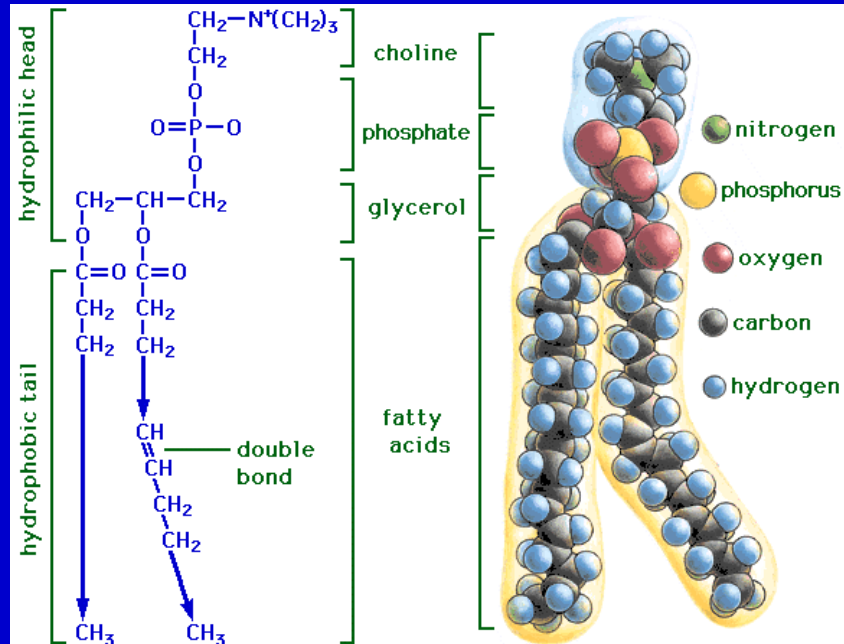


LIPIDS

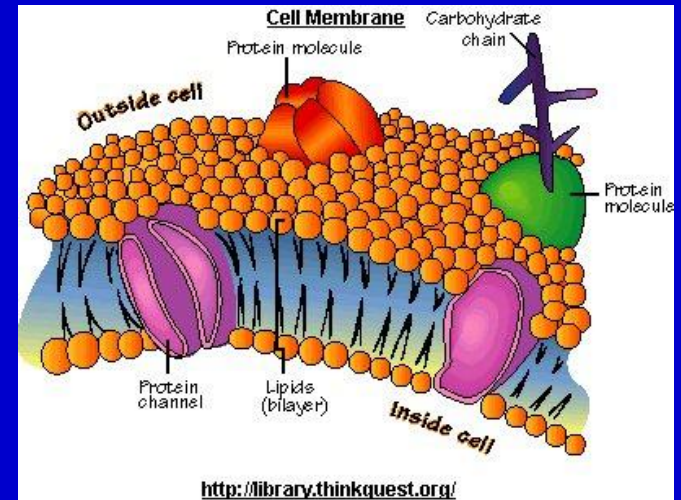
Fatty acids

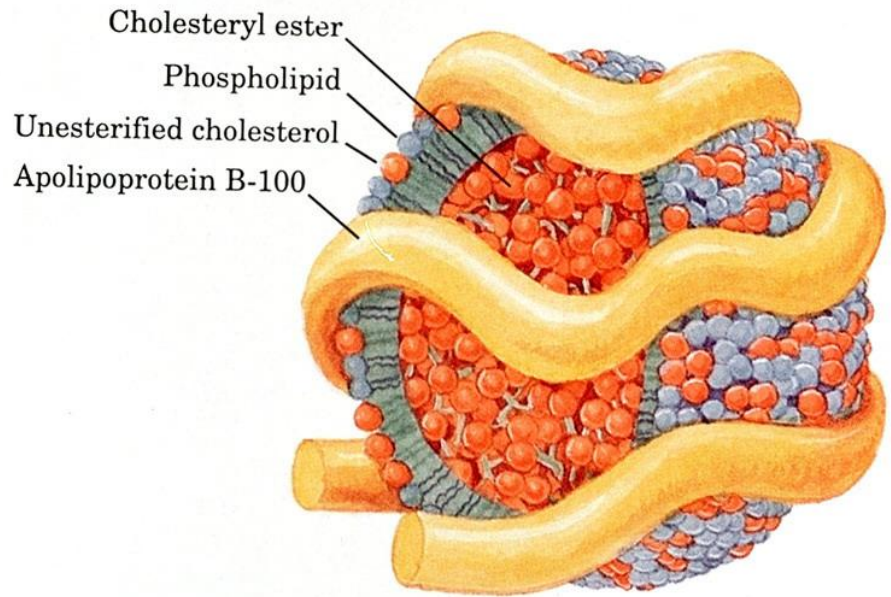
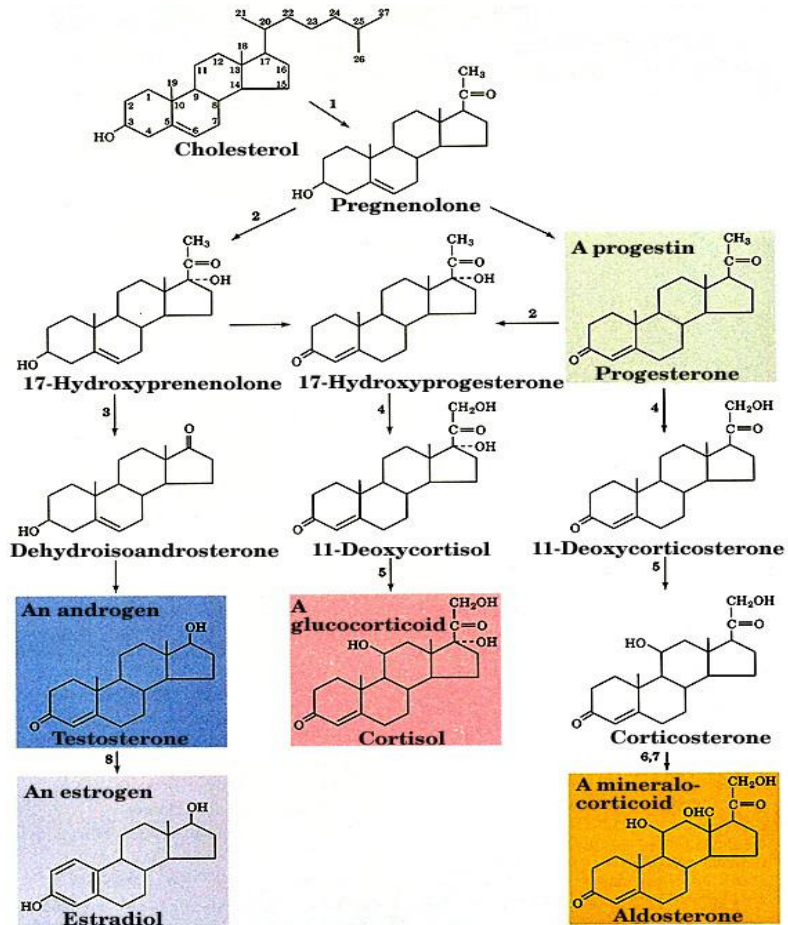


Phospholipids

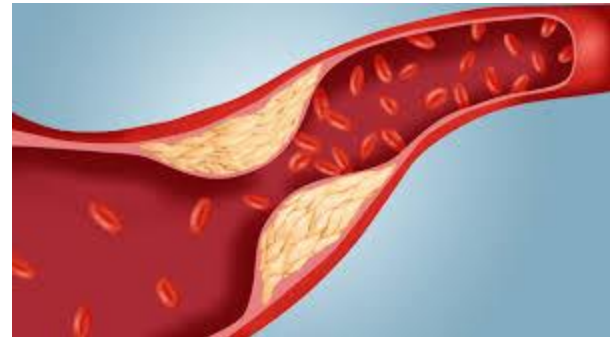


Plasma membrane

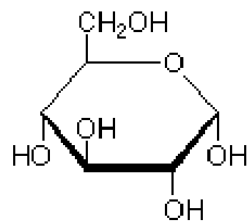




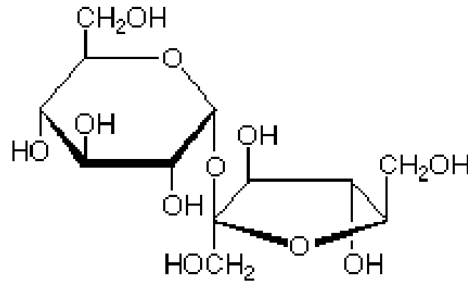
Artery with cholesterol deposit



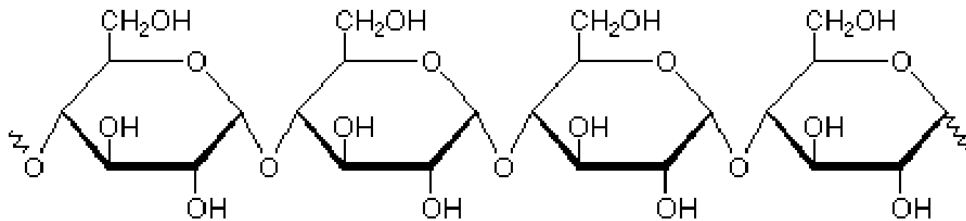
CARBOHYDRATES



glucose (a monosaccharide)



sucrose (a disaccharide)



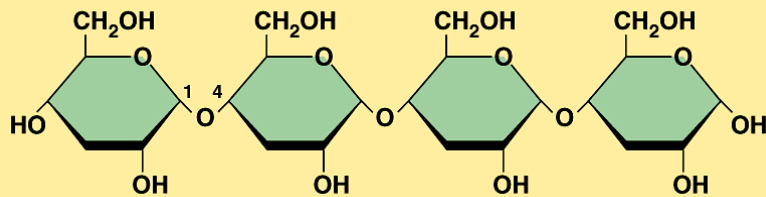
amylose (a polysaccharide/starch)



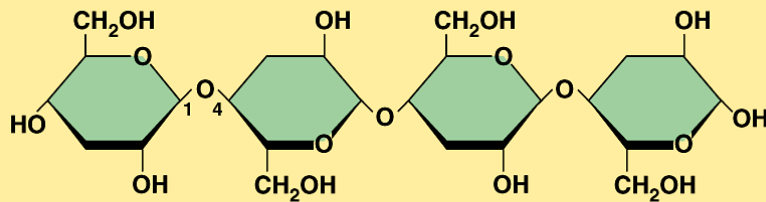
Energy sources



- Cellulose and starch are both polymers of glucose, but the bonds which hold them together are different



(b) Starch: 1-4 linkage of α glucose monomers



(c) Cellulose: 1-4 linkage of β glucose monomers

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- The difference in bonds creates differences in the molecules

The subsequent lectures can be requested from

Prof S I Rizvi sirizvi@gmail.com

Bibliography

Lehninger Principles of Biochemistry by Nelson and Cox
Biochemistry : Lubert Stryer