

Biomolécules

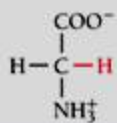
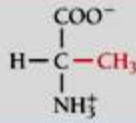
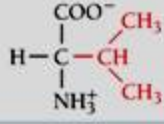
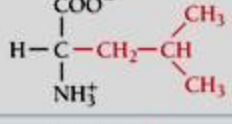
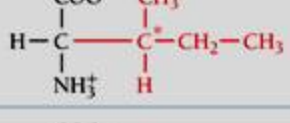
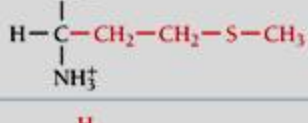
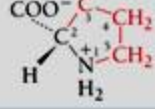
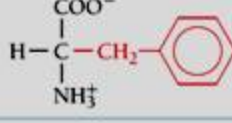
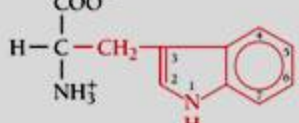
Name, Three-letter Symbol, and One-letter Symbol	Structural Formula ^a	Residue Mass (D) ^b	Average Occurrence in Proteins (%) ^c	pK ₁ α-COOH ^d	pK ₂ α-NH ₃ ⁺ ^d	pK _R Side Chain ^d
<i>Amino acids with nonpolar side chains</i>						
Glycine Gly G		57.0	7.1	2.35	9.78	
Alanine Ala A		71.1	8.2	2.35	9.87	
Valine Val V		99.1	6.9	2.29	9.74	
Leucine Leu L		113.2	9.7	2.33	9.74	
Isoleucine Ile I		113.2	6.0	2.32	9.76	
Methionine Met M		131.2	2.4	2.13	9.28	
Proline Pro P		97.1	4.7	1.95	10.64	
Phenylalanine Phe F		147.2	3.9	2.20	9.31	
Tryptophan Trp W		186.2	1.1	2.46	9.41	

Table 1.
Standard
Amino Acids
of Proteins
(Grisham and
Garrett, 2017)

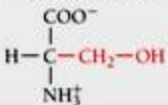
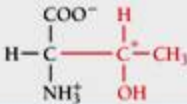
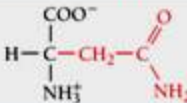
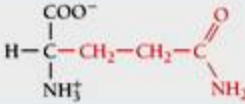
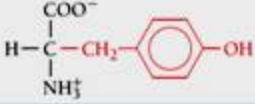
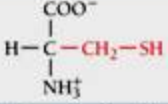
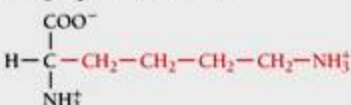
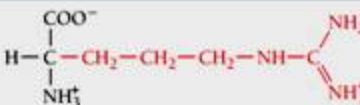
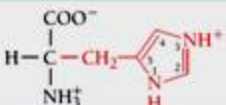
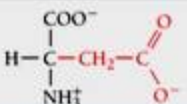
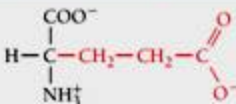
Name, Three-letter Symbol, and One-letter Symbol	Structural Formula ^a	Residue Mass (D) ^b	Average Occurrence in Proteins (%) ^c	pK ₁ α-COOH ^d	pK ₂ α-NH ₃ ⁺ ^d	pK _R Side Chain ^d
<i>Amino acids with uncharged polar side chains</i>						
Serine Ser S		87.1	6.6	2.19	9.21	
Threonine Thr T		101.1	5.3	2.09	9.10	
Asparagine ^e Asn N		114.1	4.1	2.14	8.72	
Glutamine ^e Gln Q		128.1	3.9	2.17	9.13	
Tyrosine Tyr Y		163.2	2.9	2.20	9.21	10.46 (phenol)
Cysteine Cys C		103.1	1.4	1.92	10.70	8.37 (sulfhydryl)
<i>Amino acids with charged polar side chains</i>						
Lysine Lys K		128.2	5.9	2.16	9.06	10.54 (ε-NH ₃ ⁺)
Arginine Arg R		156.2	5.5	1.82	8.99	12.48 (guanidino)
Histidine ^e His H		137.1	2.3	1.80	9.33	6.04 (imidazole)
Aspartic acid ^e Asp D		115.1	5.4	1.99	9.90	3.90 (β-COOH)
Glutamic acid ^e Glu E		129.1	6.8	2.10	9.47	4.07 (γ-COOH)

Tableau 2. Basic set of 20 amino acids *Dr Laib*

(Tymoczko et *al*, 2015)

Nonessential	Essential
Alanine	Histidine
Arginine	Isoleucine
Asparagine	Leucine
Aspartate	Lysine
Cysteine	Methionine
Glutamate	Phenylalanine
Glutamine	Threonine
Glycine	Tryptophan
Proline	Valine
Serine	
Tyrosine	

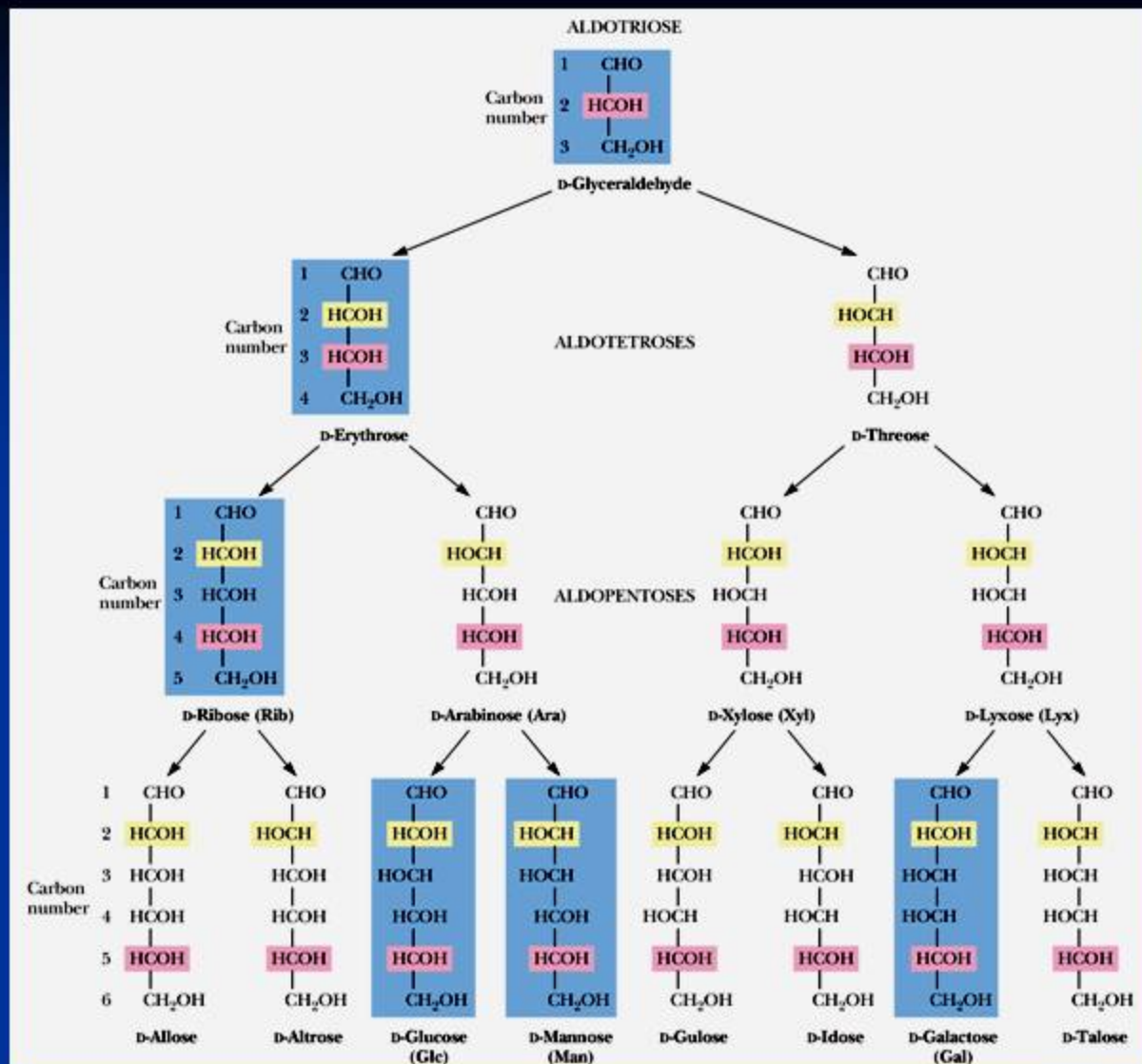


Figure 1. Héxoses

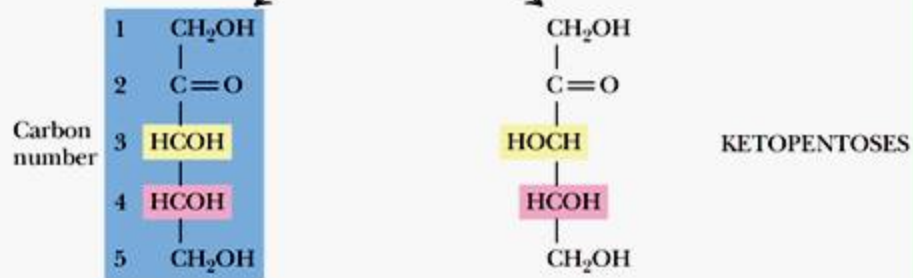
(Grisham and Garrett, 2017)



Dihydroxyacetone



D-Erythrulose



D-Ribulose

D-Xylulose

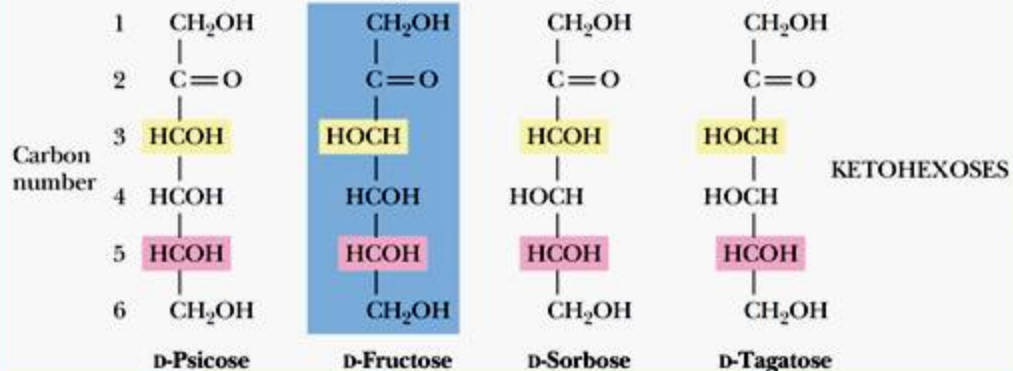


Figure 2. Cétoses.

(Grisham and
Garrett, 2017)

Tableau 3. The Common Biological

Dr Laib

Fatty Acids (Voet et al., 2016)

Symbol ^a	Common Name	Systematic Name	Structure	mp (°C)
Saturated fatty acids				
12:0	Lauric acid	Dodecanoic acid	$\text{CH}_3(\text{CH}_2)_{10}\text{COOH}$	44.2
14:0	Myristic acid	Tetradecanoic acid	$\text{CH}_3(\text{CH}_2)_{12}\text{COOH}$	53.9
16:0	Palmitic acid	Hexadecanoic acid	$\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$	63.1
18:0	Stearic acid	Octadecanoic acid	$\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$	69.6
20:0	Arachidic acid	Eicosanoic acid	$\text{CH}_3(\text{CH}_2)_{18}\text{COOH}$	77
22:0	Behenic acid	Docosanoic acid	$\text{CH}_3(\text{CH}_2)_{20}\text{COOH}$	81.5
24:0	Lignoceric acid	Tetracosanoic acid	$\text{CH}_3(\text{CH}_2)_{22}\text{COOH}$	88
Unsaturated fatty acids (all double bonds are cis)				
16:1 n -7	Palmitoleic acid	9-Hexadecanoic acid	$\text{CH}_3(\text{CH}_2)_5\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$	-0.5
18:1 n -9	Oleic acid	9-Octadecanoic acid	$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$	12
18:2 n -6	Linoleic acid	9,12-Octadecadienoic acid	$\text{CH}_3(\text{CH}_2)_4(\text{CH}=\text{CHCH}_2)_2(\text{CH}_2)_6\text{COOH}$	-5
18:3 n -3	α -Linolenic acid	9,12,15-Octadecatrienoic acid	$\text{CH}_3\text{CH}_2(\text{CH}=\text{CHCH}_2)_3(\text{CH}_2)_6\text{COOH}$	-11
18:3 n -6	γ -Linolenic acid	6,9,12-Octadecatrienoic acid	$\text{CH}_3(\text{CH}_2)_4(\text{CH}=\text{CHCH}_2)_3(\text{CH}_2)_3\text{COOH}$	-11
20:4 n -6	Arachidonic acid	5,8,11,14-Eicosatetraenoic acid	$\text{CH}_3(\text{CH}_2)_4(\text{CH}=\text{CHCH}_2)_4(\text{CH}_2)_2\text{COOH}$	-49.5
20:5 n -3	EPA	5,8,11,14,17-Eicosapentaenoic acid	$\text{CH}_3\text{CH}_2(\text{CH}=\text{CHCH}_2)_5(\text{CH}_2)_2\text{COOH}$	-54
22:6 n -3	DHA	4,7,10,13,16,19-Docosohexenoic acid	$\text{CH}_3\text{CH}_2(\text{CH}=\text{CHCH}_2)_6\text{CH}_2\text{COOH}$	-44
24:1 n -9	Nervonic acid	15-Tetracosenoic acid	$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_{13}\text{COOH}$	39