DATA SHEET

Comparison of the Amino Acids in the Beta Chain of the Hemoglobin Molecule in Eight Selected Species

Of the 106 amino acids positions in the beta hemoglobin molecule, only the 40 positions showing any differences between any of these eight species are included in this table. The other 105 positions do not vary across these eight species. The key to the amino acids is shown below. (You do not need to learn these for this exercise.)

KEY to ABBREVIATIONS for the AMINO ACIDS in BETA-HEMOGLOBIN

A: alanine	L: leucine
C: cysteine	N: asparagine
D: aspartic acid	P: proline
E: glutamic acid	Q: glutamine
F: phenylalanine	R: arginine
G: glycine	S: serine
H: histidine	T: threonine
K: lysine	V: valine
	Y: tyrosine

AA POSITION	SPECIES I	II	III	IV	V	VI	VII	VIII
1	V	V	V	V	V	V	T	V
2	H	H	H	H	H	H	F	Q
4	T	T	T	T	T	T	T	S
5	P	P	P	P	P	G	P	G
6	E	E	E	E	E	D	E	E
8	K	K	K	K	K	K	N	K
9	S	S	S	S	N	A	G	A
10	A	A	A	A	A	A	H	A
12	T	T	T	T	T	T	T	L
13	A	A	A	A	T	A	S	A
16	G	G	G	G	G	G	G	D
20	V	V	V	V	V	V	V	E
21	D	D	D	D	D	E	E	E
22	E	E	E	E	E	D	K	E
33	V	V	V	V	L	V	V	V
43	E	E	E	E	E	E	E	D
50	T	T	T	T	S	T	S	N
52	D	D	D	D	D	D	D	G
54	V	V	V	V	V	V	I	V
56	G	G	G	G	G	N	G	G
69	G	G	G	G	G	G	S	H
70	A	A	A	A	A	A	A	S
72	S	S	S	S	S	S	S	G
73	D	D	D	D	D	D	E	E
75	L	L	L	L	L	L	L	V
76	A	A	A	A	N	A	H	H
87	T	T	T	Q	Q	Q	Q	A
94	D	D	D	D	D	D	V	D
95	K	K	K	K	K	K	A	K
104	R	R	K	R	K	R	K	R
112	C	C	C	C	C	C	I	V
116	H	H	H	H	H	H	H	R
120	K	K	K	K	K	K	N	K
121	E	E	E	E	E	E	D	D
123	T	T	T	T	T	T	S	T
125	P	P	P	Q	Q	Q	Q	E
126	V	V	V	V	V	V	T	L
129	A	A	A	A	A	A	A	S
130	Y	Y	Y	Y	Y	Y	F	Y
135	A	A	A	A	A	A	T	A

SOURCES: Morris Goodman (1992). Reconstructing human evolution from proteins. In: Steve Jones et al. (1992). *The Cambridge Encyclopedia of Human Evolution.* Cambridge University Press. pp. 307-312 *and* GenBank, National Center for Biotechnology Information. http://www.ncbi.nlm.nih.gov

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