HSA DNA sequence

ATGAAGTGGGTAACCTTTATTTCCCTTCTTTTTCTCTTTAGCTCGGCTTATTCCAGGGGTGTGTTTCGTC
GAGATGCACACAAGAGTGAGGTTGCTCATCGGTTTAAAGATTTGGGAGAAGAAAATTTCAAAGCCTTG
GTGTTGATTGCCTTTGCTCAGTATCTTCAGCAGTGTCCATTTGAAGATCATGTAAAATTAGTGAATGAAG
TAACTGAATTTGCAAAAACATGTGTTGCTGATGAGTCAGCTGAAAATTGTGACAAATCACTTCATACCCT
TTTTGGAGACAAATTATGCACAGTTGCAACTCTTCGTGAAACCTATGGTGAAATGGCTGACTGCTGTGC
AAAACAAGAACCTGAGAGAAATGAATGCTTCTTGCAACACAAAGATGACAACCCAAACCTCCCCCGAT
TGGTGAGACCAGAGGTTGATGTGATGTGCACTGCTTTTCATGACAATGAAGAGACATTTTTGAAAAAAT
ACTTATATGAAATTGCCAGAAGACATCCTTACTTTTATGCCCCGGAACTCCTTTTCTTTGCTAAAAGGTA
TAAAGCTGCTTTTACAGAATGTTGCCAAGCTGCTGATAAAGCTGCCTGCCTGTTGCCAAAGCTCGATG
AACTTCGGGATGAAGGGAAGGCCTCGAGTGCCAAACAGAGACTCAAGTGTGCCAGTCTCCAAAAATTT
GGAGAAAGAGCTTTCAAAGCATGGGCAGTAGCTCGCCTGAGCCAGAGATTTCCCAAAGCTGAGTTTG
CAGAAGTTTCCAAGTTAGTGACAGATCTTACCAAAGTCCACACGGAATGCTGCCATGGAGATCTGCTT
GAATGTGCTGATGACAGGGCGGACCTTGCCAAGTATATCTGTGAAAATCAAGATTCGATCTCCAGTAA
ACTGAAGGAATGCTGTGAAAAACCTCTGTTGGAAAAATCCCACTGCATTGCCGAAGTGGAAAATGATG
AGATGCCTGCTGACTTGCCTTCATTAGCTGCTGATTTTGTTGAAAGTAAGGATGTTTGCAAAAACTATG
CTGAGGCAAAGGATGTCTTCCTGGGCATGTTTTTGTATGAATATGCAAGAAGGCATCCTGATTACTCTG
TCGTGCTGCTGCTGAGACTTGCCAAGACATATGAAACCACTCTAGAGAAGTGCTGTGCCGCTGCAGAT
CCTCATGAATGCTATGCCAAAGTGTTCGATGAATTTAAACCTCTTGTGGAAGAGCCTCAGAATTTAATC
AAACAAAATTGTGAGCTTTTTGAGCAGCTTGGAGAGTACAAATTCCAGAATGCGCTATTAGTTCGTTAC
ACCAAGAAAGTACCCCAAGTGTCAACTCCAACTCTTGTAGAGGTCTCAAGAAACCTAGGAAAAGTGGG
CAGCAAATGTTGTAAACATCCTGAAGCAAAAAGAATGCCCTGTGCAGAAGACTATCTATCCGTGGTCC

HSA Protein sequence

Met Lys Trp Val Thr Phe Ile Ser Leu Leu Phe Leu Phe Ser Ser Ala Tyr Ser Arg Gly Val Phe Arg Arg Asp Ala His Lys Ser Glu Val Ala His Ar
Phe Lys Asp Leu Gly Glu Glu Asn Phe Lys Ala Leu Val Leu Ile Ala Phe Ala Gln Tyr Leu Gln Gln Cys Pro Phe Glu Asp His Val Lys Leu Va
Asn Glu Val Thr Glu Phe Ala Lys Thr Cys Val Ala Asp Glu Ser Ala Glu Asn Cys Asp Lys Ser Leu His Thr Leu Phe Gly Asp Lys Leu Cys Th
Val Ala Thr Leu Arg Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln Glu Pro Glu Arg Asn Glu Cys Phe Leu Gln His Lys Asp Asp Asn P
Asn Leu Pro Arg Leu Val Arg Pro Glu Val Asp Val Met Cys Thr Ala Phe His Asp Asn Glu Glu Thr Phe Leu Lys Lys Tyr Leu Tyr Glu Ile A
Arg Arg His Pro Tyr Phe Tyr Ala Pro Glu Leu Leu Phe Phe Ala Lys Arg Tyr Lys Ala Ala Phe Thr Glu Cys Cys Gln Ala Ala Asp Lys Ala A
Cys Leu Leu Pro Lys Leu Asp Glu Leu Arg Asp Glu Gly Lys Ala Ser Ser Ala Lys Gln Arg Leu Lys Cys Ala Ser Leu Gln Lys Phe Gly Glu Arg Arg A
Phe Lys Ala Trp Ala Val Ala Arg Leu Ser Gln Arg Phe Pro Lys Ala Glu Phe Ala Glu Val Ser Lys Leu Val Thr Asp Leu Thr Lys Val His Th
Glu Cys Cys His Gly Asp Leu Leu Glu Cys Ala Asp Asp Arg Ala Asp Leu Ala Lys Tyr Ile Cys Glu Asn Gln Asp Ser Ile Ser Ser Lys Leu Ly
Glu Cys Cys Glu Lys Pro Leu Leu Glu Lys Ser His Cys Ile Ala Glu Val Glu Asn Asp Glu Met Pro Ala Asp Leu Pro Ser Leu Ala Ala Asp Phe V
Glu Ser Lys Asp Val Cys Lys Asn Tyr Ala Glu Ala Lys Asp Val Phe Leu Gly Met Phe Leu Tyr Glu Tyr Ala Arg Arg His Pro Asp Tyr Ser V
Val Leu Leu Leu Arg Leu Ala Lys Thr Tyr Glu Thr Thr Leu Glu Lys Cys Cys Ala Ala Ala Asp Pro His Glu Cys Tyr Ala Lys Val Phe Asp G
Phe Lys Pro Leu Val Glu Glu Pro Gln Asn Leu Ile Lys Gln Asn Cys Glu Leu Phe Glu Gln Leu Gly Glu Tyr Lys Phe Gln Asn Ala Leu Leu Val A
Tyr Thr Lys Lys Val Pro Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg Asn Leu Gly Lys Val Gly Ser Lys Cys Cys Lys His Pro Glu A
Lys Arg Met Pro Cys Ala Glu Asp Tyr Leu Ser Val Val Leu Asn Gln Leu Cys Val Leu His Glu Lys Thr Pro Val Ser Asp Arg Val Thr Lys Cy
Cys Thr Glu Ser Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe H
Ala Asp Ile Cys Thr Leu Ser Glu Lys Glu Arg Gln Ile Lys Lys Gln Thr Ala Leu Val Glu Leu Val Lys His Lys Pro Lys Ala Thr Lys Glu G
Leu Lys Ala Val Met Asp Asp Phe Ala Phe Val Glu Lys Cys Cys Lys Ala Asp Asp Lys Glu Thr Cys Phe Ala Glu Glu Gly Lys Lys Leu V
Ala Ala Ser Gln Ala Ala Leu Gly Leu

Nucleotide	mol/mol DNA	MW, g/mol	mmol/g DNA	Gene MW, g/mol
dAMP	0.285	313.2	0.923	174452
dCMP	0.215	289.2	0.695	140840
dTMP	0.285	304.2	0.923	128372
dGMP	0.215	329.2	0.695	119829
HSA gene MW, g/mol				563494

Nucleotide	mol/mol mRNA	MW, g/mol	mol/mol RNA	mmol/g RNA	mRNA MW, g/mol
AMP	0.285	329.2	0.0143	0.889	183364.4
GMP	0.215	345.2	0.0107	0.669	145674.4
CMP	0.215	305.2	0.0107	0.669	111092.8
UMP	0.285	306.2	0.0143	0.889	149119.4
HSA mRNA MW, g/mol					589251.00

Amino acid	% protein (mol/mol)	MW, g/mol	mmol/g protein	HSA MW, g/mol
Alanine	0.102	71.09	0.8928	4407.828
Arginine	0.046	156.20	0.4032	4373.684
Asparagine	0.028	114.12	0.2448	1940.023
Aspartate	0.059	115.10	0.5184	4143.744
Cysteine	0.057	103.16	0.5040	3610.6
Glutamate	0.033	128.15	0.2880	8006.122
Glutamine	0.102	129.13	0.8928	2562.92
Glycine	0.021	57.07	0.1872	741.871
Histidine	0.026	137.16	0.2304	2194.496
Isoleucine	0.015	113.18	0.1296	1018.575
Leucine	0.105	113.18	0.9216	7243.2
Lysine	0.099	128.19	0.8640	7691.34
Methionine	0.011	131.21	0.1008	918.498
Phenylalanine	0.057	147.19	0.5040	5151.72
Proline	0.039	97.13	0.3456	2331.168
Serine	0.046	87.09	0.4032	2438.604
Threonine	0.048	101.12	0.4176	2932.48
Tryptophan	0.003	186.23	0.0288	372.456
Tyrosine	0.031	163.19	0.2736	3100.629
Valine	0.071	99.15	0.6192	4263.364
Energy requirement for polymerisation			1.22	69443.322

hSOD DNA sequence

ATGGCAACAAAGGCCGTGTGCGTGCTGAAGGGCGACGGCCCAGTGCAGGGCATCATCAATTTCGAGCAGAAGGA
AAGTAATGGACCAGTGAAGGTGTGGGGAAGCATTAAAGGACTGACTGAAGGCCTGCATGGATTCCATGTTCATGAG
TTTGGAGATAATACGGCAGGCTGTACCAGTGCAGGTCCTCACTTTAATCCTCTATCCAGAAAACACGGTGGGCCAA
AGGATGAAGAGAGGCATGTTGGAGACTTGGGCAATGTGACTGCTGACAAAGATGGTGTGGCCGATGTGTCTATTG
AAGATTCTGTGATCTCACTCTCAGGAGACCATTGCATCATTGGCCGCACACTGGTGGTCCATGAAAAAGCAGATGA
CTTGGGCAAAGGTGGAAATGAAGAAAGTACAAAGACAGGAAACGCTGGAAGTCGTTTGGCTTGTGGTGTAATTGG

hSOD Protein sequence

HSA Protein sequence
AsnGlyProValLysValTrpGlySerIleLysGlyLeuThrGluGlyLeuHisGlyPheHisValHisGluPheGly
AspAsnThrAlaGlyCysThrSerAlaGlyProHisPheAsnProLeuSerArgLysHisGlyGlyProLysAspGlu
GluArgHisValGlyAspLeuGlyAsnValThrAlaAspLysAspGlyValAlaAspValSerIleGluAspSerVal
IleSerLeuSerGlyAspHisCysIleIleGlyArgThrLeuValValHisGluLysAlaAspAspLeuGlyLysGly
GlyAsnGluGluSerThrLysThrGlyAsnAlaGlySerArgLeuAlaCysGlyValIleGlyIleAlaGlnterter

Nucleotide	mol/mol DNA	MW, g/mol	mmol/g DNA	Gene MW, g/mol
dAMP	0.254	313.2	0.823	42282
dCMP	0.246	289.2	0.795	29787.6
dTMP	0.254	304.2	0.823	43804.8
dGMP	0.246	329.2	0.795	28311.2
hSOD gene gDNA/mol				144185.60

Nucleotide	mol/mol mRNA	MW, g/mol	mol/mol RNA	mmol/g RNA	mRNA MW, g/mol
AMP	0.254	329.2	0.013	0.791	44442
GMP	0.246	345.2	0.012	0.765	49708.8
CMP	0.246	305.2	0.012	0.765	26247.2
UMP	0.254	306.2	0.013	0.791	31538.6
hSOD mRNA MW, g/mol					151936.60

Amino acid	% protein (mol/mol)	MW, g/mol	mmol/g protein	hSOD MW, g/mol
Alanine	0.065	71.09	0.6284	710.94
Arginine	0.026	156.20	0.2514	624.812
Asparagine	0.045	114.12	0.4399	798.833
Aspartate	0.071	115.10	0.6912	1266.144
Cysteine	0.026	103.16	0.2514	412.64
Glutamate	0.065	128.15	0.6284	1281.46
Glutamine	0.019	129.13	0.1885	387.393
Glycine	0.162	57.07	1.5710	1426.675
Histidine	0.052	137.16	0.5027	1097.248
Isoleucine	0.058	113.18	0.5656	1018.575
Leucine	0.058	113.18	0.5656	1018.575
Lysine	0.071	128.19	0.6912	1410.079
Methionine	0.006	131.21	0.0628	131.214
Phenylalanine	0.026	147.19	0.2514	588.768
Proline	0.032	97.13	0.3142	485.66
Serine	0.065	87.09	0.6284	870.93
Threonine	0.052	101.12	0.5027	808.96
Tryptophan	0.006	186.23	0.0628	186.228
Tyrosine	0.000	163.19	0.0000	0
Valine	0.091	99.15	0.8798	1388.072
Energy requirement for polymerisation (ATP):			0.31	15913.206