

# Nucleotide sequence of the cDNA encoding L-histidine decarboxylase derived from human basophilic leukemia cell line, KU-812-F

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Histamine is a chemical mediator released from basophils or mast cells and plays an important role in allergic reactions. The formation of histamine from L-histidine is catalyzed by L-histidine decarboxylase (HDC, EC4.1.1.22) which is localized in various tissues including brain, stomach and fetal liver as well as in basophils and mast cells (1). Recently Joseph *et al.* isolated HDC cDNA from rat fetal liver cDNA library and determined its nucleotide sequence (2). Here we present the nucleotide and deduced amino acid sequence of the cDNA coding for human HDC. A cDNA library of human basophilic leukemia cell, KU-812-F (3), was constructed in the Okayama-Berg expression vector (4) and screened with the synthetic oligonucleotides complementary to nucleotide sequence of the rat HDC cDNA (nucleotide residues 547–596 and 970–1019) (2). One clone

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AGT GCG CAG GAC TGG CAA GAG GGA AGC CGG GCT GCT CCA GCG CTT TCA GCG CTT CCA CCT    60
CGT GCG TGT CCA TCT GTG AGA AGG AGC CAG AGC CCA AGG GAG ATG ATG GAG CCT GAG GAG    120
TAC AGA GAG AGA GGG AGA GAG ATG GTG GAT TAC ATC TGC CAG TAC CTG AGC ACT GTG GGG    180
GAG AGA CGT GTG ACG CCA GAC GTG CAG CCT GGC TAC CTG CGA GCC CAG CTG CCT GAG AGT    240
GCT GCT GAG GAC CCG GAC AGC TGG GAC AGC ATC TTT GGG GAC ATT GAA CGA ATC ATC ATG    300
CCT GGG GTG GTA CAT TGG CAG AGC CCC CAT ATG CAC GCC TAC TAC CGA GCC CTC ACC TCT    360
TGG CCC TCC CTG CTA GGA GAC ATG CTG GCT GAT GCC ATC AAC TGC TTG GGA TTC ACC TGG    420
GCA TGC ACC CCT GCG TGT ACA GAG CTG GAG ATG AAC GTC ATG GAC TGG TTG GCA AAA ATG    480
CTG GGA CTT CCA GAG CAC TTC TTG CAC CAC CAC CCC AGC AGC CAG GGC GGA GGC GTC CTG    540
CAG CAG ACG GTC AGT GAA TCC ACT TTG ATT GCC CTG GCA GCA AGG AAG AAC AAA ATC    600
CTG GAA ATG AAA ACG TCT GAG CCC GAT GCT GAT GAG TCC TGC CTA AAT GCC CGA CTC GTG    660
GCC TAT GCC TCT GAC GAG GCT CAC TCC TCT GTG GAA AAG GCT GGT TTG ATT TCC CTT GTG    720
AAG ATG AAA TTT CTG CTT GCT GAT GAC AAC TTC TCA CTC CGA GGC GAA GCT CTT CAG AAG    780
GCC ATC GAG GAA GAC AAG CAG GGC GGC TTG GTG CCC GTC TTT GTC TGT GCA ACA CTA GGG    840
ACC ACT GGG TCT GTC TTT GAC TTT GAC CTG GCA GAG CTG GGC CCC ATC TGT GCC CGT GAG    900
GGG CTG TGG CTC CAC ATC GAT GCT GCT TAT GCA GGC ACT GCC TTC CTG TGC CCC GAG TTC    960
CGG GGC TTT CTG AAG GGG ATT GAG TAT GCC GAC TCC TTC ACC TTT AAT CCT TCC AAG TGG    1020
ATG ATG GTC GAT TTT GAC TGT ACT GGG TTC TGG GTC AAG GAC AAG TAC AAG CTG CAG CAG    1080
ADC TTC AGT GTG AAT CCC ATC TAC CTC AGG CAT GCC AAC TCA GGC GTC GGC ACC GAC TTC    1140
    
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ATG CAC TGG CAG ATC CCC CTG AGC CGA CGG TTT CCC TCT GTT AAA CTC TGG TTC GTC ATT    1200
Met His Trp Gln Ile Pro Leu Ser Arg Arg Phe Arg Ser Val Lys Leu Trp Phe Val Ile    366
CGG TCC TTC GCG GTG AAG AAT CTT CAA OCA CAT GTC AGA CAT GGT ACT GAA ATG OCT AAA    1260
Arg Ser Phe Gly Val Lys Asn Leu Gln Ala His Val Arg His Gly Thr Glu Met Ala Ile    386
TAT TTT GAA TCT CTG GTC AGA AAC GAC CCT TCC TTT GAA ATT OCT GCC AAG AGG CAC CTT    1320
Tyr Phe Glu Ser Leu Val Arg Asn Asp Pro Ser Phe Glu Ile Pro Ala Lys Arg His Leu    406
GGC CTG GTG GTT TTT GGT CTA AAG GGT CCT AAT TGT CTC ACA GAA AAT GTG TTA AAG GAA    1380
Gly Leu Val Val Phe Arg Leu Lys Gly Pro Asn Cys Leu Thr Glu Asn Val Leu Lys Glu    426
ATA GCT AAA GCT GCG GGT CTC TTC CTC ATC CCG GCC ACT ATC CAG GAC AAG TTA ATC ATC    1440
Ile Ala Lys Ala Gly Arg Leu Phe Leu Ile Pro Ala Thr Ile Gln Asp Lys Leu Ile Ile    446
GGT TTC ACT GTG ACA TCC CAG TTT ACC ACT AGG GAT CAG ATC CTC AGA GAC TGG AAT CTC    1500
Arg Phe Thr Val Thr Ser Gln Phe Thr Thr Arg Asp Asp Ile Leu Arg Asp Trp Asn Leu    466
ATT CGA GAT GCT GCC ACT CTC ATC CTG AGT CAG CAC TGT ACT TCC CAA CCC AGC CCT GGG    1560
Ile Arg Asp Ala Ala Thr Leu Ile Leu Ser Gln His Cys Thr Ser Gln Pro Ser Pro Arg    486
GTT GGC AAC CTC ATC TCC CAA ATC AGG GGT GCC AGA GCG TGG GCC TGT GGA ACG TCC CTT    1620
Val Gly Asn Leu Ile Ser Gln Ile Arg Gly Ala Arg Ala Trp Ala Cys Gly Thr Ser Leu    506
CAG TCT CTC AGT GCG CCA GGA GAT GAT GCA CTC CAG GCC AGG AAG ATC ATC AAG CAG CCT    1680
Gly Ser Val Ser Arg Val Gly Asp Asp Ser Val Gln Ala Arg Lys Ile Ile Lys Gln Pro    526
CAG GGT GTG GGA GCG GGT CCC ATG AAA AGG GAA AAT GGC CTC CAT CTT GAA ACC CTG CTG    1740
Arg Arg Ala Gly Pro Met Lys Arg Gly Ser Val Leu Ser Leu Glu Thr Leu Leu Leu    546
GAC CCA GTT GAT GAC TGC TTT TCA GAA GAG GCC OCA GAT GCC ACC AAG CAC AAG CTG TCC    1800
Asp Pro Val Asp Asp Cys Phe Ser Glu Glu Ala Pro Asp Ala Thr Lys His Leu Leu Ser    566
TCC TTC CTG TTC AGT TAC TTG TCT GTG CAG ACT AAG AAG AAG ACG GTG GCG TCC CTC AGT    1860
Ser Phe Leu Phe Ser Tyr Leu Ser Val Gln Thr Lys Lys Lys Thr Val Arg Pro Ser Leu    586
TGC AAC AGT CTC CCA GTC ACT GCT CAG AAG CCA GGC ACC ACA GCG CCT TCT GTC AAG AAT    1920
Cys Asn Ser Val Pro Val Ser Ala Gln Lys Pro Leu Pro Thr Thr Glu Ala Ser Val Lys Asn    606
GGC GGC TCC TCC AGG GTC AGA ATC TTT TCC AAG TTT CCA GAA GAC ATG ATG ATG CTC AAG    1980
Gly Gly Ser Ser Arg Val Arg Ile Phe Ser Arg Phe Pro Glu Asp Met Met Met Lys Leu    626
AAA AGT GCC TTC AAA AAA CTC ATC AAA TTC TAC AGC GTC GCC AGC TTT CCT GAA TGC AGC    2040
Lys Ser Ala Phe Lys Lys Leu Ile Lys Phe Tyr Ser Val Pro Ser Leu Phe Leu Glu Cys Ser    646
TCT CAA TGT GGA CTC CAG CTG CCC TGT TCC CCT CTG CAG GCC ATG GTT TAG ACA CAG GGC    2100
Ser Gln Cys Gly Leu Gln Leu Pro Cys Cys Pro Thr Thr Thr Glu His Met Val ***    663
CTT CAG CAG AGT CTG AGG ATA TAC TTC AGG GAC TCT GTG AAC CCC TCA CAA TTG TAT GCC    2160
AAC TTT GTG TGC TTA TGT GTA CAT GCA TTT TTC TTG GCG GGA GTT CAT AAT TTT AAT CAA    2220
ATT CTC ATA GGG GCT CAT GAC CCA CAA TAG GAT ACA AAC GAA GAG TTT AAG CCA GCA TGA    2280
TCC AGA TGG GTT CAT CAG TCT GGT CAG TGA GAA AGG GCC GAG GGT AGA CAG GCA GCT TCT    2340
GTG GTT CAG CTT GTG ACA TGA TAT ATA CAG ACA AAA TAA ATT ATG CTT GTC OCT GAA AAA    2400
    
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pTN-2, containing an insert of 2.4 kb, is confirmed to encode human HDC by transient expression of HDC activity in COS cells (data not shown). Human HDC consists of 662 amino acid residues ( $M_r$  74,178) and shares 85% homology in amino acid sequence with rat HDC.

## REFERENCES

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