Drosophila Cu-Zn superoxide dismutase cDNA sequence

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Copper-zinc superoxide dismutase (Cu-Zn SOD) is a eucaryotic cytoplasmic enzyme which destroys superoxide, a toxic radical which forms by a one electron transfer to oxygen (1). We have isolated a cDNA from a λ gt10 library (embryo) of *Drosophila melanogaster* cDNA (2) using a synthetic probe derived from the codons for amino acids 90-98 (3). The corresponding mRNA when translated would be expected to give rise to a protein with an amino acid sequence identical with that found by Lee et al. (3) for *Drosophila* Cu-Zn SOD^F except it would have not only the expected N-terminal methionine but also an additional valine at the carboxyl terminus as indicated below.

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-75      -60      -45      -30      -15      -1
ccccccccccacaccatagaagatacctggaaagtcttcaactttttcgttttgataaattgattaattcattcgaa
15      30      45      60
ATG GTG GTT AAA GCT GTC TGC GTA ATT AAC GGC GAT GCC AAG GGC ACG GTT TTC TTC GAA
Met Val Val Lys Ala Val Cys Val Ile Asn Gly Asp Ala Lys Gly Thr Val Phe Phe Glu
75      90      105      120
CAG GAG AGC AGC GGT ACG CCC GTG AAG GTC TCC GGT GAG GTG TGC GGC CTG GCC AAG GGT
Gln Glu Ser Ser Gly Thr Pro Val Lys Val Ser Gly Glu Val Cys Gly Leu Ala Lys Gly
135      150      165      180
CTG CAC GGA TTC CAC GTG CAC GAG TTC GGT GAC AAC ACC AAT GGC TGC ATG TCG TCC GGA
Leu His Gly Phe His Val His Glu Phe Gly Asp Asn Thr Asn Gly Cys Met Ser Ser Gly
195      210      225      240
CCG CAC TTC AAT CCG TAT GGC AAG GAG CAT GGC GCT CCC GTC GAC GAG AAT CGT CAC CTG
Pro His Phe Asn Pro Tyr Gly Lys Glu His Gly Ala Pro Val Asp Glu Asn Arg His Leu
255      270      285      300
GGC GAT CTG GGC AAC ATT GAG GCC ACC GGC GAC TGT CCC ACC AAG GTC AAC ATC ACC GAC
Gly Asp Leu Gly Asn Ile Glu Ala Thr Gly Asp Cys Pro Thr Lys Val Asn Ile Thr Asp
315      330      345      360
TCC AAG ATT ACG CTC TTC GGT GCC GAC AGC ATC ATC GGA CGC ACC GTT GTC GTG CAC GCC
Ser Lys Ile Thr Leu Phe Gly Ala Asp Ser Ile Ile Gly Arg Thr Val Val Val His Ala
375      390      405      420
GAT GCC GAT GAT CTT GGC CAG GGT GGA CAC GAG CTG AGC AAG TCA ACG GGC AAC GCT GGT
Asp Ala Asp Asp Leu Gly Gln Gly Gly His Glu Leu Ser Lys Ser Thr Gly Asn Ala Gly
435      450      465      480
GCC CGC ATC GGG TGC GGC GTT ATT GGC ATT GCC AAG GTC TAA gcgataatctattccgatgtcgg
Ala Arg Ile Gly Cys Gly Val Ile Gly Ile Ala Lys Val ###
495      510      525      540      555
ccactgtgctgactactctatttagcactaccactggagatatacaaacgatatacatacttctaaacataataca
570      585      600      615      630
tagccctgtggtctgttagttgatacgcaacctttgaggttcataaattggtgttttgaaattgcccoataaacaacaaa
660
aaaaaaaaaaaaagggaatt

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This cDNA was found to hybridize to 68A4-9 on *Drosophila* polytene chromosomes which is in the region (68A2-C1) earlier designated by genetic means as containing the Cu-Zn SOD gene (4).

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REFERENCES

- (1) Oberley, L. W. (ed.) (1982) Superoxide Dismutase vols. I, II. CRC Press, Inc., Boca Raton, Florida.
- (2) Poole, S. J., Kaurer, L. M., Drees, B. and Kornberg, T. (1985) *Cell* **40**, 37-43.
- (3) Lee, Y. M., Friedman, D. J., and Ayala, F. J. (1985) *Arch. Biochem. Biophys.* **241** 577-589.
- (4) Campbell, S. D., Hilliker, A. J. and Phillips, J. P. (1986) *Genetics* **112** 205-215.