A wheat cDNA clone which is homologous to the 17 kd heat-shock protein gene family of soybean

Elizabeth F. McElwain and Steven Spiker

Department of Genetics, North Carolina State University, Raleigh, NC 27695, USA

Submitted January 18, 1989

EMBL accession no. X13431

We screened a wheat cDNA library with antibodies to low molecular weight proteins from wheat germ. Three of the clones selected are homologous to the family of 17 kd heat-shock protein (hsp) genes of soybean (1). The wheat C5-8 clone has an open reading frame encoding a 150 amino acid polypeptide that is identical to the 17 kd soybean hsps at nearly 70% of the amino acid residues. The wheat C5-8 and soybean 17.5E open reading frames are aligned below (dashes indicate identities, asterisks mark gaps). The amino acid sequences differ significantly at the N-termini, but the C-terminal two-thirds of the proteins are 83% identical (74% at the nucleotide level). This is the first gene isolated from a monocot that has homology to the soybean hsp genes.

```

      10      20      30      40      50      60      70      80      90     100     110
GAATTCCTTTTCTACCTACGATCCGATACCGAATTTCCGAGCGCACAAAGCAAACCAAGCAAACTGACGATGTCGATCGTGAGGCGGAGCAACGTGTTGACCC
Wheat C5-8:                                     M S I V R R S N V F D P
Gmhsp 17.5E:                                     M S L I P G F F G G - - S - - - -
      120     130     140     150     160     170     180     190     200     210     220
CTTCGCCGACCTTTGGGCGGACCCCTTCGACACCTTCCGTCCATCGTCCCGGCGATCTCAGCGCGGACGAGCAGCGCCGCGTTCCGCAACGCCCGGTGTGACTGGA
F A D L W A D P F D T F R S I V P A I S G G S S E T A A F A N A R V D W K
- S L D M W - - - K D - H V P T S S V - A E N - * * * - - V S T - - - -
      230     240     250     260     270     280     290     300     310     320     330
AGGAGACCCCCGAGGCGCACGTCTTCAAGGTCGACCTCCCGGCGGTGAAGAAGGAGGAGGTCAAGGTGGAGGTGGAGGACGCCAACGTGCTCGTCTCAGCGCGGAGCGG
E T P E A H V F K V D L P G V K K E E V K V E V E D G N V L V V S G E R
- - - - - A - I - L - - - - - Q I - - D R - - Q I - - - -
      340     350     360     370     380     390     400     410     420     430     440
AGCAGGAGGAGGAGGACAGAACGACGACGTCGACCGGTGGAGCGGACGAGCGGCAAGTTTCGCGGCTCCGCGAGGACGCCAAGGTGGAGGAGGTCAA
S R E K E D K N D K W H R V E R S S G K F V R R F R L P E D A K V E E V K
N V - - - - - T - - - - - T - - - - - M - - - N - - -
      450     460     470     480     490     500     510     520     530     540     550
GGCCGGGCTGGAGAACGGCGTGTCTACCGTCACCGTCCGCAAGGCCGAGGTCAAGAAGCCGAGGTGAAGGCCATCGAGATCTCCGGCTGACTGCATGCGTTTGACGTA
A G L E N G V L T V T V P K A E V K K P E V K A I E I S G
- S M - - - - - E - - - - - D - - - - -
      560     570     580     590     600     610     620     630     640     650     660
TGCTCATTCAGGTTGGAGCCAATTTGGTGTGATGTGTGCGAGTCTTCCGAGTCTGATGAGACATCTCTGATTGTGTTCTTTCCCAAGTGTTTCTGTACTTGTGTA
ATCGCGCTAATCGCCACAGATTCCGGCGATGAATAATGAGAAATAAATTGTTCTGATTTTGAGTGCAAAAAAAGGAATT
      670     680     690     700     710     720     730     740

```

ACKNOWLEDGEMENTS

This research was supported by NIH grant GM-37810. This is paper 11988 of the Journal Series of the North Carolina Agricultural Research Service, Raleigh, NC. 27695-7643

REFERENCE

1. Czarnecka, E. et al. (1985) Proc. Natl. Acad. Sci. USA 82:3726-3730.