

Nucleotide Sequence of a cDNA Encoding the ADP/ATP Carrier from Wheat (*Triticum turgidum*)¹

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The adenine nucleotide carrier is the most abundant mitochondrial membrane protein. It catalyzes the exchange of adenine nucleotides between mitochondrial matrix and cytosol and plays a central role in the integration of mitochondrial metabolism. We have characterized an ADP/ATP carrier cDNA from wheat (*Triticum turgidum*) with a view toward gaining an understanding of the expression and biogenesis of this protein in higher plants.

The cDNA sequence has been obtained from a wheat single-stranded cDNA by PCR utilizing sequence information from the *Zea mays* homolog (Bathgate et al., 1989). Overlapping cDNA fragments were obtained. To extend the sequence to the 5' end a modified cDNA tailed with a poly(A) was used.

The cDNA of the ADP/ATP carrier is 1035 bp in length. The open reading frame encodes the mature protein consisting of 331 amino acids (Table I). The amino acid sequence of the wheat ADP/ATP carrier is 90.3 and 79.6% identical to that of the ADP/ATP carrier from maize (Bathgate et al., 1989) and rice (Hashimoto et al., 1993). Most of the differences are located at the N-terminal region. Since the function of this region is not known, the significance of these differences is not understood.

Table I. Characteristics of the ADP/ATP carrier from wheat

Organism:	<i>Triticum turgidum</i> .
Function:	Transport of adenine nucleotides across the inner mitochondrial membrane.
Cloning Techniques:	Overlapping cDNA fragments were generated by PCR on wheat cDNA. Primers' sequences were synthesized on the basis of the <i>Z. mays</i> ADP/ATP carrier gene. The cDNA fragments were cloned and sequenced by the dideoxy chain termination method. Both strands were sequenced at least three times.
Sequence Identification:	DNA and protein sequence comparisons with <i>Z. mays</i> ADP/ATP carrier.
Structural Features of the Protein:	Open reading frame of 331 amino acids. The predicted protein has a molecular mass of 31,740 D. Sequence similarity with <i>Z. mays</i> and rice ADP/ATP carrier at the amino acid level is 90.3 and 79.6%, respectively. It has a tripartite structure made of homologous sequences about 100 amino acids in length. The repetitive elements are related to those found in other mitochondrial carriers. The hydropathy plot suggests the presence of two membrane-spanning segments for each element.
Antibody:	Not available.

Received September 30, 1994; accepted October 11, 1994.
Copyright Clearance Center: 0032-0889/95/107/1473/01.
The EMBL accession number for the sequence reported in this article is X80023.

¹This work was supported by Consiglio Nazionale delle Ricerche of Italy, special project RAISA, subproject No. 2, paper No. 1965.

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