

## Update section

### Sequence

# Nucleotide sequence of cDNA encoding the precursor of the 23 kDa photosystem II protein of tomato

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Photosystem II (PSII) in higher plants is a multiprotein transmembrane complex residing in the thylakoids of chloroplasts. Oxygen evolution activity of inside-out thylakoid vesicles is inhibited by treatment with 250 mM NaCl, which releases water-soluble polypeptides of 17 and 23 kDa from PSII [1]. Rebinding of the purified 23 kDa protein restores activity; this observation first implicated the 23 kDa protein as a component of the oxygen-evolving complex.

The cDNA encoding the 23 kDa PSII protein from tomato (*Lycopersicon esculentum*) was isolated from a cDNA library probed with the corresponding cDNA from mustard (*Sinapis alba*) (Fig. 1). The amino acid sequence of the mature protein is 86% identical to that for tobacco (*Nicotiana tabacum*) [2], also a member of the Solanaceae family. The mustard and spinach (*Spinacia oleracea*) proteins share, respectively, 85% and 81% sequence identity with the tomato protein [3, 4].

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## References

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1: ACAAATTATCTAAAACATATTGACCCTCCAACATCACCATTGTAACAAAGAATTGGAAA
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61: ATCCATTCCCAAACCAAACAAAGAGAGTAATTGAGCAATGGCTGCTTCCACACAATGT
..... M A A S T Q C
121: TTCTTGCACCAATATCATGCACTAAGATCTAGCCCTGCTAGAACATCCTCTGTTTCATCT
F L H Q Y H A L R S S P A R T S S V S S
181: CCTAAGCCTAACCAATTGATTGCCGTGCACAAAAGCAAGATGATGCCAGCAACGCCGCC
P K P N Q L I C R A Q K Q D D A S N A A
241: GTCTCGAGACGATTGGCTCTTACTCTCCTCATTGGTACTGCTGCCATTGGTTCCAAGGT
V S R R L A L T L L I G T A A I G S K V
301: TCCCCTGCAGATGCTGCCATGGAGAAGCTGCAAATGTTTTGGTAAGCCAAAGGAAAAC
S P A D A A Y G E A A N V F G K P K E N
361: ACTGATTTCTTGCCATACAACGGAGATGGATTCAAGCTCCAAGTCCCAGCCAAATGGAAC
T D F L P Y N G D G F K L Q V P A K W N
421: CCCAGCAAAGAAGTTGAGTACCCTGGTCAGGTTCTCAGATATGAAGACAACCTTGATTCC
P S K E V E Y P G Q V L R Y E D N F D S
481: ACAAGTAATCTTATTGTTGCACTTACTCCAAGTACAGAAAGTCCATCACCGACTACGGC
T S N L I V A V T P T D K K S I T D Y G
541: TCCCCTGAAGAGTTCTCTCTAAAGTGGACTATCTGCTAGGAAAGCAAGCTTACTTTGGC
S P E E F L S K V D Y L L G K Q A Y F G
601: AAAACTGATTGAGAGGGAGGATTGAATCTGGTGCAGTGGCAACTCGTAACCTGTGGAG
K T D S E G G F E S G A V A T R N L L E
661: GCATCAAGCGCAACAGTGGGAGGAAAAGTACTACTACTTGTGAGTATTGACAAGAAGT
A S S A T V G G K E Y Y Y L S V L T R T
721: GCAGATGGAGATGAAGGTGGAAAGCACCAGTTGATCACAGCCACAGTGAATGATGGCAA
A D G D E G G K H Q L I T A T V N D G K
781: CTTTACATTTGCAAGGCACAAGCTGGTGACAAGAGATGGTTAAGGGTCTAAAAAGTTT
L Y I C K A Q A G D K R W F K G A K K F
841: GTGGAGAATGCTGCCACTTCTTTCAGTATTGCTTAAGAATGGGAAACTAAAGAAAACCA
V E N A A T S F S I A @ .....
901: TTATTTAAGTTGTATGTACTTAGTTCTTCCCCCTCTACAAAACATATGGTGCTGAGAT
.....
961: GAGTTGCTTAATTGGACTTCTTTTTGCTCTTTAAAC
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*Fig. 1.* Nucleotide sequence of cDNA encoding the precursor to the tomato 23 kDa PSII protein. The deduced amino acid sequence (one-letter codes, 258 residues) of the precursor is aligned with corresponding codons in the cDNA. The arrow between amino acids 72 and 73 identifies the transit peptide processing site. The mature polypeptide is 186 amino acids long.