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# Root-specific genes from tobacco and *Arabidopsis* homologous to an evolutionarily conserved gene family of membrane channel proteins

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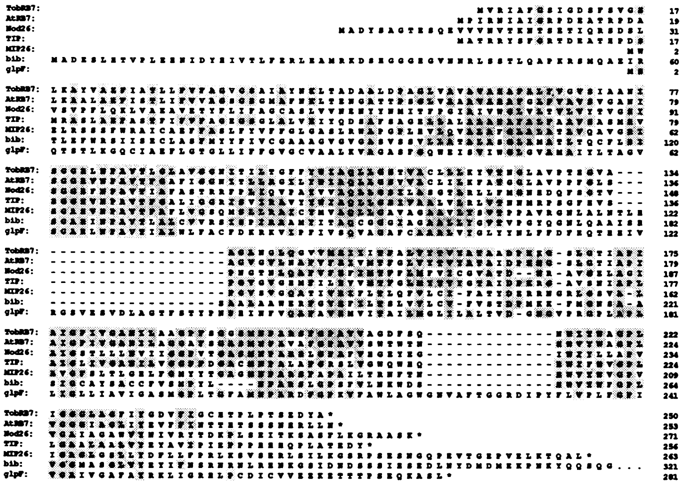
TobRB7 is a cDNA isolated from a cDNA library constructed of tobacco root mRNA (1). It had been shown to be expressed specifically in roots, to be transcriptionally regulated, and to be encoded by a small gene family (1). The TobRB7−5A (a full-length TobRB7 cDNA) nucleotide sequence data will appear in EMBL, Genbank, and DDBJ Nucleotide Sequence Databases under the accession number X54855. The deduced TobRB7 amino acid (250 amino acids, $M_r = 25{,}233$) sequence initiated at the first ATG of the sequence. This putative initiation site agrees with the consensus sequence surrounding eucaryotic initiation sites (Kozac's rules) (2), is preceded by two in-frame termination codons and thus is the likely initiation codon. To examine the amino acid sequence of a TobRB7 homologue from another plant species, a cDNA library constructed of mRNA isolated from *Arabidopsis* roots was screened at low stringency. A full length counterpart of TobRB7, designated AtRB7, was isolated. The AtRB7 nucleotide sequence data will appear in EMBL, GenBank, and DDBJ Nucleotide Sequence Databases under the accession number X54854. The predicted TobRB7 and AtRB7 proteins exhibit high similarity to a number of protein sequences believed to function as membrane channels, including the mammalian lens fiber major intrinsic protein (MIP26) (3), a soybean peribacteriod membrane nodulin (Nod26) (4, 5), a membrane pore type protein of *E. coli*, the glycerol facilitator (glpF) (6), the *Drosophila* neurogenic protein *big brain* (bib) (7), and a tonoplast protein of soybean seed storage vacuoles (TIP) (8) (Fig. 1). Regions in which at least 3 of the 7 sequences exhibited amino acid identity are shaded.

Transport is an important function of root tissue. Water and nutrients are taken up by the roots, transported via symplastic and apoplastic pathways across the root epidermis, cortex, casparian strip, endodermis, pericycle, and ultimately to the vascular system for transport to the aerial parts of the plant. In return, the roots receive photosynthetic assimilates. Compelling evidence has accumulated that implicate membrane channels in facilitating such transport processes (9). Structural similarities of the TobRB7 and AtRB7 proteins with the MIP26, Nod26, glpF, TIP, and bib proteins, lead us to postulate a possible functional similarity; the TobRB7 and AtRB7 proteins may be components of single- or double-membrane channel systems and possibly be involved in cell-to-cell channelling in the root.



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