Plant cDNA homologue to rat insulinoma gene encoding ribosomal protein S15

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Rat insulinoma gene (rig) was first isolated from a rat insulinoma cDNA library (1). Homologues of rig were also isolated from human (2), hamster (2), mouse (3), chicken (3) and Xenopus laevis (3) cDNA libraries. The amino acid sequences of isolated rig in the mammals and bird were completely conserved (100%). Using immunological methods, Kitagawa et al. (4) demonstrated that rig is in fact encoding for ribosomal protein S15.

We have isolated putative genes by random sequencing of cDNA clones prepared from suspension cultured cells of rice (Oryza sativa, L. van Yamahoushi) (5). By comparing nucleotide sequences of cDNA clones to GenBank database, we found one cDNA clone showing high homology with rig. The entire nucleotide sequence (697 bp) of this cDNA (rice rig) contains an open reading frame encoding a polypeptide of 152 amino acids. Figure 1 shows a comparison of the deduced amino acid sequences of rig in rice, rat and Xenopus laevis. The rice rig shares 67% and 64% amino acid identity with rat rig and Xenopus laevis rig, respectively. The putative nuclear location signal (RKAKKEAPP) that is completely conserved in the rig of mammals, chicken and Xenopus laevis is not seen in the rice rig. This may be a characteristic feature of the rig in plants. Putative DNA binding domain (GVYNGKTFNQV) of rig was also conserved in the rice rig.

Sugawara et al. (3) reported that rig constitutes a multicopy gene family in mammalian genomes and single copy in chicken and Xenopus laevis genome. DNA blot analysis indicated that the rice rig is located at a single locus of the rice nuclear genome.

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REFERENCES


Table 1. Alignment of amino acid sequences of rice, rat and Xenopus laevis rig cDNAs. Each amino acid sequence is represented by the standard single letter code. Identical amino acid residues are indicated by asterisks. Gaps are introduced to obtain maximum similarity. The consensus amino acid sequences of putative nuclear location signal and putative DNA binding domain are shown at the bottom. An accession number for the entire nucleotide sequence (697 bp) of rice rig is D10962 deposited in DDBJ, EMBL and GenBank.

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