

The yeast PRP2 protein, a putative RNA-dependent ATPase, shares extensive sequence homology with two other pre-mRNA splicing factors

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We have shown previously that the *PRP2(RNA2)* gene product of the yeast, *Saccharomyces cerevisiae* is required to convert the pre-mRNA to linear exon 1 and lariat intron-exon 2 in the spliceosome (1). Here we report the nucleotide sequence of a 3177 bp EcoRI/BamHI DNA fragment within which the *PRP2* gene is located (2–4; Figure 1). An open reading frame encoding a protein of 876 amino acids is found (Figure 1). The predicted molecular weight of 100 kDa is consistent with that of the PRP2 protein detected immunologically (5, 6). Surprisingly, the PRP2 protein sequence shares extensive homology with two other yeast pre-mRNA splicing factors, PRP16 (7) and PRP22 (8; J. Abelson, personal communication). These proteins share about 25% overall amino acid sequence identity, and about 42% within a stretch of approximately 400 residues which contains a putative RNA-dependent ATPase domain (7, 9; Figure 1). This is very intriguing since each of the three PRP proteins is involved in a distinct ATP-dependent step in pre-mRNA splicing. Furthermore, the DEAD sequence found in ATP-dependent RNA helicases (9) is replaced by DEAH in these PRP proteins. A putative zinc finger motif, which might be involved in RNA binding, is also found in the PRP2 protein sequence (10; Fig.

1). We are currently characterizing the PRP2 protein in vitro for these properties.

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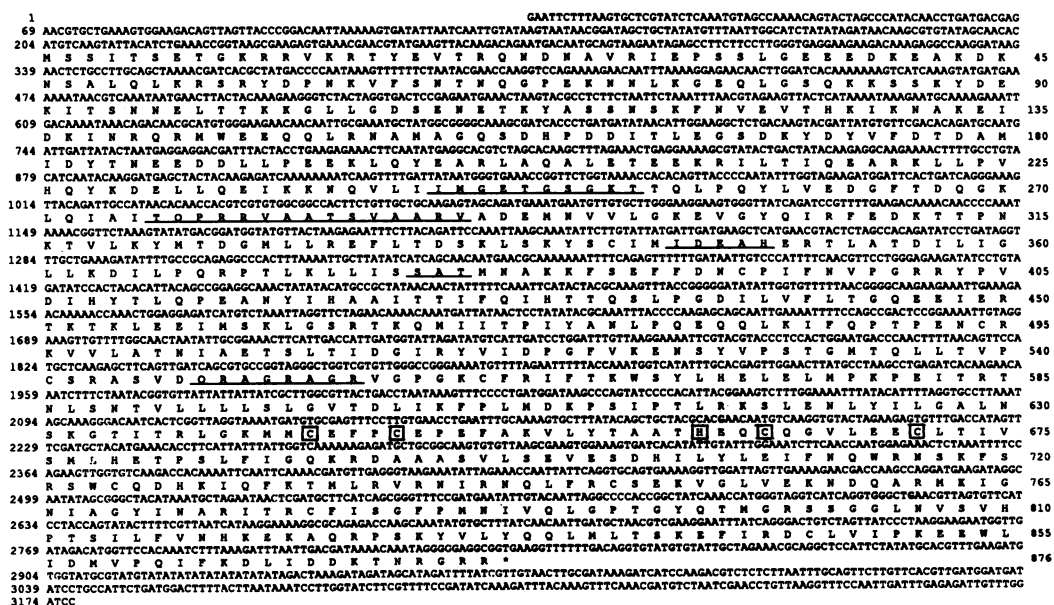


Figure 1. The DNA and deduced protein sequences of the yeast *PRP2* gene. Plasmid pJDB207/RN2-1 was obtained from J. Woolford, and the 3.2 kbp EcoRI/BamHI fragment containing the *PRP2* gene was subcloned into pUC18. DNA sequence was determined by the dideoxy method using synthetic oligonucleotides as primers. The number of nucleotide is given on the left and the number of amino acid on the right. Motifs found in a family of RNA-dependent ATPase are underlined (7, 9). The cysteine and histidine residues in the putative zinc-finger are boxed.