Nucleotide sequence of a wheat mitochondrial glutamine tRNA gene

Paul B.M.Joyce and Michael W.Gray

Department of Biochemistry, Dalhousie University, Halifax, Nova Scotia B3H 4H7, Canada Submitted December 14, 1987

We present the sequence of a wheat mitochondrial (mt) glutamine tRNA gene (underlined in Fig. 1) with its flanking regions. We show most of an 800 base pair (bp) *HindIII/Ssl* subclone (of an original 4200 bp *HindIII* clone, H-Q1), over a region that has been sequenced on both strands. The protocols for isolating and sequencing tRNA gene-containing clones have been discussed previously [1].

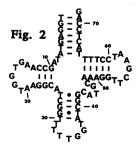
When the *HindIII/Ssfi* clone was used to probe wheat mtDNA hydrolyzed with *HindIII*, *EcoRI*, or *BamHI*, a single band was seen in each case, suggesting that the tRNA<sup>Gln</sup> gene is

present once in the wheat mt genome.

The tRNA<sup>Gln</sup> gene sequence (anticodon TTG) can be folded into the standard cloverleaf secondary structure, with no structural deviations (Fig. 2). This gene shows greater sequence similarity with eubacterial and chloroplast tRNAs<sup>Gln</sup> (>75%) than with yeast mt or animal mt tRNAs<sup>Gln</sup> (<50%) [2]. The 24 nucleotides preceding the tRNA gene (positions 237-260 in Fig. 1) show 55% sequence identity with the 23 nucleotide spacer separating tRNA<sup>Lon</sup> and tRNA<sup>Gln</sup> genes in E. coli [3]. The sequence from positions 193 to 228 (dotted underline in Fig. 1) shows 75% identity with the final 36 nucleotides of the T. glabrata mt tRNA<sup>Gly</sup> coding sequence [2].

Using the criteria outlined previously [1], there are no direct or inverted repeats downstream (within 100 bp) and only two direct repeats (overlined with arrows in Fig. 1) upstream (within 150 bp) of this tRNA gene. The sequence AAGAANRR found upstream of other wheat mt tRNA genes [1] is also found here (boxed in Fig. 1).

Fig. 1



## References:

- Joyce, P.B.M., Speacer, D.F., Bonen L., Grzy, M.W. (1988) Genes for tRNA<sup>Ap</sup>, tRNA<sup>Pp</sup>, tRNA<sup>Ty</sup>, and two tRNAs<sup>Sec</sup> in wheat mitochondrial DNA. Plant Mol. Biol. (in press).
- [2] Sprinzl, M., Hartmann, T., Meissner, F., Moll, J., Vorderwülbecke, T. (1987) Compilation of tRNA sequences and sequences of tRNA genes. Nucl. Acids. Res. 15, Supplement: r53-r188.
- [3] Nakajima, N., Ozeki, H., Shimura, Y. (1981) Organization and structure of an E. coli tRNA operon containing seven tRNA genes. Cell 23: 239-249.

Supported by a Studentship (to PBMJ) and Operating Grant (MT-4124 to MWG) from the Medical Research Council of Canada.

110

220 330

440

550

W