Volume 17 Number 4 1989 Nucleic Acids Research

# cDNA cloning of the wheat germ SRP 7S RNAs

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Submitted January 17, 1989 EMBL accession nos X13913–X13915

The signal recognition particle (SRP) is an 11S particle involved in the targeting of secretory proteins to the rough endoplasmic reticulum (1). Mammalian SRP is composed of six polypeptide chains and a single 7S RNA (300 nucleotides)(2). The wheat germ SRP equivalent (3) is shown here to consist of a mixture of particles containing several sequence variants of the 7S RNA. When wheat germ SRP was used as a source of 7S RNA at least six mobility variants were resolved after denaturing polyacrylamide electrophoresis. cDNA cloning using a maize derived 7S RNA specific oligonucleotide primer demonstrated that the mobility variants represent true sequence heterogeneity and not the products of degradation. cDNA clones for 7S RNA variants Wg#2 and Wg#3 show 70% and 84% similarity with Wg#1. Other plant 7S RNAs show 67%-72% similarity with Wg#1 whilst mammalian, amphibia, insect and yeast show 35%-43%. Secondary structures proposed on the basis of phylogenetic comparisions and computer predictions show major structural conservation when compared with the tomato and mammalian 7S RNAs (4,5).

Wheat germ SRP 7S RNA sequences:

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            .10       .20       .30       .40       .50       .60       .70
Wg#1 nccgagcucaguugCGAGAGCUUGUAACCGA.GUGGGGGCAUUAAAGUGAUGUGAACGCUGUUGUAGCGCUGCGGGCCUG
Wg#2 .............CGGGAGCUUGUCACCCAUGUGGGGGCAUUGAGGCGGUGUGGAUGCUUGGUGCGGUUUGUUGGCCUG
Wg#3 ......................................................................................
     .............**.********.***.*.***********.*.*******.*.***......*...**..*.****

        .80       .90      .100      .110      .120      .130      .140      .150
Wg#1 GUCUGGGUCUGGGUGUGCUACUGCUGGCCCGCCCGUUCCAAGUUGCGUAGUGGA...GCCUGGGGUUAUGCGAAAGACUG
Wg#2 GGCUUG....UGAUGUAACCUUGCUGGCCUGCCCGUUCCAAGUUG.GUAGUGGGCUGG..GUGGCUGGGGCGAAAGCUUC
Wg#3 ......................GGUGGUCUGCCCGUUCCAAGUUGAGUAGUGGACGCGUUGGGGCCUAUGCGAAAG.UUG
     *.**.*.....*.***.....**.***.*.***************.*******....*....**.....*******..*.

        .160      .170      .180      .190      .200      .210      .220      .240
Wg#1 GGUCUACGGUCCAUAAUGUGGCAGGCACAGCGUGAGGCUGGCUUCACAGAGCAGCGACAACUG.CCGCUUCCAACGGUGG
Wg#2 GCCUUCUCAGGCCUUAAGUGGCAGGCACCACGUUAGGCUGGUUUCACAGAGCAGCGACAACUGCCCGCUUCCAACGGUGG
Wg#3 GGCUAACGGUCCAUAAUGUGGCAGGCACCGCGUGAGGCUGGCUUCACAGAGCAGCGACAACUG.CCGCUUCCAACGGUGG
     *..........*.*.*.***********..***.*******.*********************.****************

            .240      .250      .260      .270      .280                .290
Wg#1 AAGGAUAAUGGGCCGCUGCACUCCUAGCCAAUUGGCCUCG.CAGCCUACUCC........AGCAGACCACC.........
Wg#2 AAGGAUAACAGGCCGCUGCAGCAGCAUGGGCCCGCUCUGGGCCUCCUACCCCGCCAUAGCAGCAGACCACC.........
Wg#3 AAGGAUAACGGG.CGCUGCACUCCUAGCCGCUUGGCCUCG.UAGCCUACUCC........AGCAGACCACCA........
     ********..**.*******............*..**.*....*****.**.......____________........
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cDNA synthesis was primed using the oligonucleotide primer 5'AAAGATGGTGGTCTGCT 3'. Sequences derived from the oligonucleotide primer are underlined. Lower case indicates primer extension data derived using the oligonucleotide 5'ACCTTAATGCCCCC 3'. Asterisks denote sequence similarity between cDNA clones. Sequences are numbered with respect to the Wg#1 7S RNA variant.

Acknowledgements:
We thank Dr.N.Campos, Dr.B.Dobberstein and Dr.W.Filipowicz for their assistance in this work.

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