We reported previously that 4.5S RNA is associated with poly A RNA of rodent cells (1). However, this molecule was not found in human, monkey, cat, mink, rabbit or chicken cells (1). In HeLa cells, several 4S RNAs are released from the poly A RNA fraction (1). We determined the nucleotide sequence of one of the most abundant 4S RNA species in this fraction. Nucleotide sequence analysis was performed as described previously (2). This RNA is 75 nucleotides long with 14 modified nucleotides. This sequence can be drawn in a clover-leaf structure typical of tRNA with the anticodon NUG, as shown in the figure. The modified nucleotide N is probably a derivative of U, based upon its mobility on two dimensional thin layer chromatography and its influence on the electrophoretic mobility of the parent oligonucleotide. Therefore, we designated this RNA as tRNA^{Gln}_{NUG}. N is resistant to RNase A digestion, but is sensitive to RNase T2 digestion. Therefore N cannot be a 2'-O-methyl derivative. We also analyzed the poly A RNA fraction of HeLa cells by the combination of two dimensional polyacrylamide gel electrophoresis and denaturing polyacrylamide gel electrophoresis (2). We obtained two tRNA species whose RNase T1 fingerprints are similar to that of tRNA^{Gln}_{NUG}. The nucleotide sequence of one of them was the same as that of tRNA^{Gln}_{NUG}. The another species (tRNA^{Gln}_{noc2}) differs from tRNA^{Gln}_{NUG} in only one nucleotide at position 3 (C/U, see figure). Therefore, incompleteness of base pairing in the acceptor stem of tRNA^{Gln} must be essential for the association between this tRNA and poly A RNA. The nucleotide sequence of tRNA^{Gln}_{noc2} is the same as that of mouse tRNA^{Gln} except for two post-transcriptional modifications, one being N/Um at the first position of the anticodon (3).

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