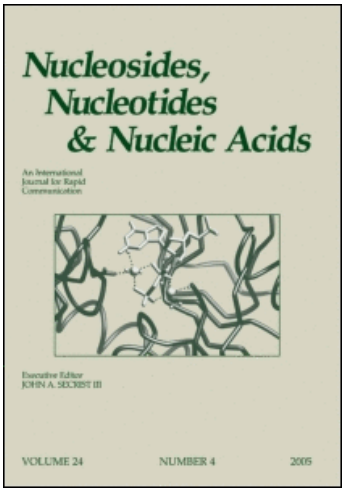

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First, Solid Support-Aided Introduction of Isopentyladenosine, Hypermodified Nucleose of TRNA, into Oligoribonucleotide Chain

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FIRST, SOLID SUPPORT-AIDED INTRODUCTION OF ISOPENTYLADENOSINE, HYPERMODIFIED NUCLEOSIDE OF tRNA, INTO OLIGORIBONUCLEOTIDE CHAIN.

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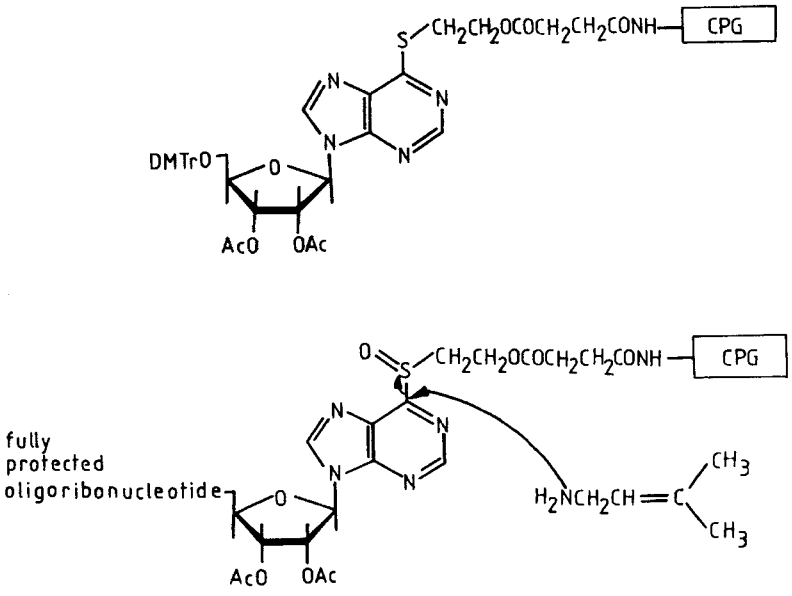
Abstract: A concept of chemical, solid support-aided, introduction of N(6)-isopentenyladenosine, into oligoribonucleotide chain is outlined.

Hypermodified nucleosides of tRNA have been subjected to numerous chemical and structural studies /1/. Synthesis of oligoribonucleotides containing these multifunctional molecules presents considerable challange. Since our pioneering work /2/ on the synthesis of tRNA anticodon loop heptamer composing of N(6)-threonylcarbonyladenosine, only one case, concerning introduction of various hypermodified wobble-uridines to short oligoribonucleotides, was fully investigated /3,4/. Phosphotriester chemistry, in solution, was applied in both above cases.

Here, we would like to present a new concept (compare /5/) of N(6)-isopentenyladenosine introduction into oligoribonucleotide chain reflecting recent developments in general chemical RNA synthesis. Multistep synthesis of the model AAAi(6)A consists of the following key reactions:

1. transformation of inosine into N(5'-O-DMT-2',3'-O-di-O-acetyl nebularin-6-yl)pyridinium chloride /6/,
2. its quantitative reaction with mercaptoethanol to form 6(2-hydroxyethyl)tiopurine analogue /7/,
3. 2-hydroxyethyl function esterification with succinic anhydride and subsequent active ester formation followed by coupling with LCAA-CPG

4. 5'-O-DMT removal and solid supported extention of RNA chain with application of 5'-O-DMT-2'-O-TBDMSi-N-benzoyladenosine- 3'-O-(N,N--diisopropyl)(2-cyanoethyl)phosphoramidites; final trityl on,
5. oxidation with buffered (pH 6.5) bromine to form 6-alkylsulphoxide linkage,
6. S_NAr-displacement with isopentenylamine resulting in hypermodification and detachment of partially protected AAAi(6)A from the support,
7. final deprotection , purification and analysis of AAAi(6)A.



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REFERENCES

1. Adamiak,R.W. and Górnicki,P. (1985) Prog.Nucleic Acids Res.Mol.Biol., 32, p.27 , Ed. W.E.Cohn, Academic Press, N.Y.,
2. Adamiak,R.W., Biała,E., Grześkowiak,K., Kierzek,R., Kraszewski,A., Markiewicz,W.T., Okupniak,J., Stawiński,J and Wiewiórowski,.(1978) Nucleic Acids Res., 5, 1889 ,
3. Małkiewicz,A. and Sochacka,E. (1983) Tetrahedron Lett., 5387 ,
4. Małkiewicz,A., Nawrot,B. and Sochacka,E. (1987) Nucleic Acids Res. Symp.Ser., 18, 97 ,
5. Świderski,P., Dembek,P., Antkowiak,W.Z., Biała,E. and Adamiak,R.W. (1987) ibid., 105 ,
6. Adamiak,R.W., Biała,E. and Skalski,B. (1985) Nucleic Acids Res.,13, 2989,
7. Adamiak,R.W., Biała,E. and Skalski,B. (1985) Angew.Chem., 26, 7