ONE-POT SYNTHESIS OF OLIGORIBONUCLEOTIDE FROM UNBLOCKED NUCLEOSIDE

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We report a novel polycondensation procedure for a rapid and convenient oligoribonucleotide synthesis which involves the use of unprotected ribonucleoside as a starting material and phosphorus tris-azole as a phosphorylating reagent. The procedure is very simple; the reaction of unprotected ribonucleoside with phosphorus tris-azole, and the *in situ* oxidation of the resulting phosphite with iodine and water.

Tri-(azol-1-yl)phosphine does not attack the 5'-OH group of unprotected ribonucleoside in the first phosphorylation step. The polymerization reaction proceeds *via* the ribonucleoside 2',3'-cyclic phosphorazole 2 which is formed by selective attack of tri-(azol-1-yl)phosphine at the 2'- and 3'-OH groups of ribonucleoside. Generally, the reaction of phosphorus compound with *cis*-glycols gives only the cyclic phosphite ester. This observation supports the intermediacy of the cyclic compound 2. The intermediate ribonucleoside 2',3'-cyclic phosphorazole 2 reacts readily with the 5'-OH group of 1 or 2 forming the oligomer 3 having cyclic phosphite triester link. The structure of the oligomer 3 was confirmed by ^{31}P nmr. The signals of + 156.7 ppm and + 143.7 ppm were assigned to be cyclic phosphite triester and the terminal phosphorazole, respectively. The *in situ* oxidation of the oligomer 3 with iodine and water readily gave oligoribonucleotides 5. This process involved the ring-opening of the cyclic phosphite followed by the oxidation of the phosphite 4 to the phosphate 5. The type of phosphodiester linkage is controllable.