SOME NEW ASPECTS IN THE SYNTHESIS OF PURINE 8-N-CYCLONUCLEOSIDES

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Among the hitherto known purine cyclonucleosides which can serve as basic models for gaining insight into the relationship between conformation and biological activity or physicochemical properties, notably rare members are those having a 8-nitrogen bridge. We report here some recent progress in this field.

As in the synthesis of some purine cyclonucleosides with a 8,2'-methylhydrazo bridge (T. Sasaki et al., J. Org. Chem., 1981, 46, 5176), treating 1a-c with excess hydrazine at 90° followed by careful work up allowed the isolation of rather unstable 8,2'-hydrazo cyclonucleosides 2a-c in 70-80% yields. Compound 2a and 2b were quantitatively converted into the corresponding N^{β},2'-didehydro analogues 3a and 3b, using various oxidants involving air. Sodium methoxide catalyzed air oxidation of 3a,b in methanol gave mixtures of unstable substances, from which 4a,b were isolated in low yields.

On the other hand, we have found a convenient method for the general synthesis of purine 8,5'-imino (or substituted imino) cyclonucleosides, excluding the notorious intramolecular quaternization at N^3 by $C_{5'}$ carrying a leaving group. Thus, 5a-d with diphenyl carbonate/Et_3N in DMF at 135° gave the corresponding cyclonucleosides 6a-d in 30-40% yields. 6a,b were deprotected to 7a,b. Reductive debenzylation of 6c,d with naphthalene anion followed by deprotection gave 7c,d.