Dimethylaminomethylene-\(\alpha\)-D-xylo-hept-5-ulofuranurononitrile as Building Block in the Synthesis of ‘Reversed’ C-Nucleoside Analogues

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3-O-Benzyl-6-deoxy-1,2-O-isopropylidene-6-(dimethylaminomethylene)-\(\alpha\)-D-xylo-hept-5-ulofuranurononitrile (1) was reacted with amidinium salts, \(S\)-methylisothiouronium sulfate, and guanidinium chloride, respectively, in the presence of bases to furnish the 4-(3-O-benzyl-1,2-O-isopropylidene-\(\alpha\)-D-xylo-tetrofuranos-4-yl)pyrimidine-5-carbonitriles 2 and the 4-(1,2-O-isopropylidene-\(\alpha\)-D-glycero-tetr-3-enofuranos-4-yl)pyrimidine-5-carbonitriles 3, respectively. Treatment of 1 with ethyl 5-aminopyrazole-4-carboxylates yielded the ethyl 7-(3-O-benzyl-1,2-O-isopropylidene-\(\alpha\)-D-xylo-tetrofuranos-4-yl)-6-cyanopyrazolo[1,5-\(a\)]pyrimidine-3-carboxylates 4 and the ethyl 7-amino-6-(3-O-benzyl-1,2-O-isopropylidene-\(\alpha\)-D-xylo-pentofuranuronoyl)pyrazolo[1,5-\(a\)]pyrimidine-3-carboxylates 5, respectively. Reaction of 1 with 2-benzimidazolylacetonitrile in the presence of sodium methanolate afforded 1-amino-2-(3-O-benzyl-1,2-O-isopropylidene-\(\alpha\)-D-xylo-pentofuranuronoyl)benzo[4,5]imidazo[1,2-\(a\)]pyridine-4-carbonitrile (6) and 1-amino-2-(3-deoxy-1,2-O-isopropylidene-\(\alpha\)-D-glycero-pent-3-enofuranuronoyl)benzo[4,5]imidazo[1,2-\(a\)]pyridine-4-carbonitrile (7).

Key words: ‘Reversed’ C-Nucleoside Analogues, 5-Aminopyrazoles, Pyrimidines, Pyrazolo[1,5-\(a\)]pyrimidines, Benzo[4,5]imidazo[1,2-\(a\)]pyridine