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[Lab. of Medicinal Chemistry]

**Synthesis and Anti-human Immunodeficiency Virus Type 1 (HIV-1)
Activity of 3-Substituted Derivatives of 3'-Azido-3'-deoxythymidine
(AZT), and Inhibition of HIV-1 Reverse Transcriptase by Their 5'-
Phosphates.**

YUKIO KITADE, AKIYUKI SUSUKI, KOSAKU HIROTA*, YOSHIFUMI MAKI,
HIDEO NAKANE, KATSUHIKO ONO, MASANORI BABA, SHIRO SHIGETA

Various 3-substituted 3'-azido-3'-deoxythymidine analogs were prepared by the reaction of 3'-azido-3'-deoxythymidine (AZT) with *N,N*-dimethylformamide dialkylacetals or alkyl bromides in the presence of base and their activities against human-immunodeficiency virus type-1 (HIV-1) were evaluated. The corresponding 5'-triphosphate analogs were also synthesized in order to examine inhibition of HIV-1 reverse transcriptase activity. Among the compounds obtained, 3-allyl-AZT was the most active against HIV-1 replication in the MT-4 cells *in vitro* with an EC₅₀ value of 0.9 μ M.

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The Dimroth Rearrangement of 6-Aminouracil Derivatives.

KOSAKU HIROTA*, PEI-ZHOU NI, AKIYUKI SUSUKI, HIDEKI TAKASU,
YUKIO KITADE, YOSHIFUMI MAKI

The reaction of 6-amino-5-formyl (or acetyl) uracils possessing a phenyl group at the 1-position with caustic alkali resulted in Dimroth rearrangement to give 6-anilino-5-formyl (or acetyl) uracils. This is the first example of Dimroth rearrangement observed in the uracil ring system. The presence of both the *N*₁-phenyl group and the 5-formyl (or acetyl) group on the uracil ring is requisite for the occurrence of the rearrangement.

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**Oxidative Cyclization of 2',3'-*O*-Isopropylideneadenosines into 5'-*O*,8-
Cycloadenosines with Lead Tetraacetate : Remarkable Effect of *N*⁶-
Substituents of the Oxidation.**

YUKIO KITADE, TOHRU MAKI, KOSAKU HIROTA, YOSHIFUMI MAKI*

Oxidation of 2',3'-*O*-isopropylideneadenosines with lead tetraacetate in dry benzene resulted in the formation of the corresponding 5'-*O*,8-cyclo-2',3'-*O*-isopropylideneadenosines, which has a new methodological implication for the chemical modification of adenosines. The occurrence of the oxidative cyclization was remarkably affected by the nature of *N*⁶-substituents : *N*⁶-benzoyl substitution prominently accelerated the oxidative cyclization in comparison with none and dimethyl substitutions. In the oxidation of *N*⁶,*N*⁶-dimethyladenosine, an intriguing oxidative demethylation was observed.