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**ANALYSIS OF URINARY NUCLEOSIDES FROM AIDS PATIENTS
USING GC/MS**

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ABSTRACT: Nucleosides in the urine from AIDS patients were analyzed using combined gas chromatography/mass spectrometry (GC/MS). Several modified nucleosides from the AIDS urine were present in elevated amounts compared to a pooled normal urine sample.

Urine samples from patients with positive ELISA tests and clinical symptoms of acquired immunodeficiency syndrome (AIDS) were examined for nucleosides. These nucleosides, which are present in either elevated or decreased amounts in the AIDS patient urine, or absent in normal urine, may serve as biological markers of HIV infection.

Using HPLC methods, several nucleosides in the urine of AIDS patients have previously been reported to be elevated¹. In the present study, combined GC/MS was used to characterize the trimethylsilyl-derivatized nucleosides. Prior to GC/MS analysis, urinary nucleosides were isolated using boronate gel affinity chromatography, followed by partial fractionation by reversed-phase HPLC.

Levels of several nucleosides in a urine from a patient with advanced symptoms of AIDS were compared to nucleoside levels in a pooled normal urine (PNU) sample consisting of 300 healthy subjects, with quantitation performed by HPLC/UV

NUCLEOSIDE	AIDS (mg/24-hr) ^c	PNU (mg/24-hr)	%RIC ^a	LIT. VALUE ^b (mg/24-hr)
Psi	142.3 ± 8.1	65.7 ± 4.8	90	74.8 ± 6.5
m ¹ A	6.6 ± 0.4	7.2 ± 0.5	85	6.2 ± 0.02
4,3-PCNR	7.0 ± 0.4	3.8 ± 0.3	98	2.2 ± 0.2
X	11.9 ± 2.1	3.3 ± 0.2	98	0.45
m ³ U	1.4 ± 0.1	1.1 ± 0.1	98	0.32
m ¹ I	18.6 ± 1.0	5.6 ± 0.4	98	4.1 ± 0.1
m ¹ G	10.2 ± 0.3	3.2 ± 0.2	90	0.5 ± 0.1
m ² G	9.3 ± 0.4	3.2 ± 0.2	70	1.4 ± 0.1
A	0.7 ± 0.03	1.4 ± 0.4	90	N/A
m ² C	13.7 ± 0.7	6.8 ± 0.5	98	5.1 ± 0.5
t ⁶ A	6.6 ± 0.2	2.9 ± 0.2	N/A	3.7 ± 0.3
MTA	5.5 ± 0.2	0.9 ± 0.1	85	N/A

^aRIC is calculated using GC/MS data.

^bG.B. Chheda, H.B. Patrzyk, H.A. Tworek, and S.P. Dutta, in "Chromatography and Modification of Nucleosides, Part C, C.W. Gehrke and K.C. Kuo, eds., Elsevier, Amsterdam, pp. 185-230 (1990).

^cValues in boxes are statistically significant compared to PNU ($p < 0.01$).

absorbance (see Table). As can be seen in the table, most of the nucleosides quantitated in the AIDS urine are significantly elevated when compared with the PNU sample. Many of these modified nucleosides have previously been reported to be elevated in AIDS urine¹, but X and MTA have not. HPLC/UV alone can give an indication of nucleoside levels, while precise quantitation, as well as identification of unknown nucleosides, are possible with GC/MS. Quantitative GC/MS studies are in progress. Numerous other nucleosides, some of which have not been identified, were also found in the AIDS urine.

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