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DNA Typing for the Confirmation of Manipulation in Dope Control: A Casework

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This paper was presented at the 13th Cologne Workshop on Dope Analysis 1995 and will be published in a comprehensive publication elsewhere.

Abstract

In routine dope control a manipulation - six different athletes delivered identical urines - could be detected by the screening method for volatile nitrogen containing substances, by steroid profiling and by HPLC finger printing. The results were confirmed by PCR based analysis of urinary DNA with the two STR (short tandem repeat polymorphism) systems FGA (HUMFIBRA) and D18S51. According to our knowledge, this is the first documented case in dope control, where DNA typing was used to prove manipulation of urine samples. The advantage of the DNA typing is the possibility to individualize the urine samples by comparison of urine and blood results.
In table 1 are presented steroid profiling data and data of DNA typing with the two STR systems.

Tab. 1: Steroidprofiling data and STR phenotypes of six identical urines. AND/ETIO - area ratio of androsterone/etiocholanolone, AND/TEST - concentration ratio of androsterone/testosterone, TEST/EPIT - area ratio of testosterone/epitestosterone. STR data of the two systems are presented in number of repeats; n.a. - no amplification.

	Steroid profiling data			STR data	
Sample	**AND/ETIO**	**AND/TEST**	**TEST/EPIT**	**D18S51**	**FGA**
1	129	1.99	0.45	18	8 / 10
2	129	1.96	0.44	16 / 18	8 / 10
3	129	1.99	0.43	n.a.	n.a.
4	125	1.96	0.45	16 / 18	8 / 10
5	128	1.98	0.44	n.a.	8
6	128	1.97	0.44	18	8 / 10