Project Review

"Long-term metabolites of 17-methylsteroids – investigation on 18-nor-17-hydroxymethyl-17-androstane derivatives"

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For metandienone 18-nor-17β-hydroxymethyl-17α-methyl-androsta-1,4,13-trien-3-one was recently identified as long-term metabolite in human urine. As the metabolic fate of the D-Ring of other 17-methylated steroids was found to be similar up to now, those steroids may also yield analogue metabolites.
The project aims to investigate the excretion of 18-nor-17-hydroxymethyl-17-methyl-androstane derivatives in human urines after the application of different 17-methyl steroids. The structures of the respective metabolites will be confirmed by comparison with reference substances. These compounds will be synthesised and characterised by means of mass spectrometric and NMR techniques.
Additionally the kinetics of the excretion will be investigated in order to determine whether these compounds are also suitable as long-term metabolites in doping control.

Long-term metabolites of 17 methylsteroids: investigation on 18-nor-17-hydroxymethyl-17 methyl-androstane derivatives

Results and Conclusions

For Metandienone 17β-hydroxymethyl-17α-methyl-18-norandrosta-1,4,13-trien-3-one was recently identified as long-term metabolite in human urine. As the metabolic fate of the D-ring of other 17-methylated steroids was found to be similar up to now, the excretion of analogous 17-hydroxymethyl-17-methyl-18-norandrostane derivatives in human urines after the application of different other 17-methyl steroids was studied. Following Dehydrochloromethyl-testosterone (DHCMT), Methyl-1-testosterone and Methyltestosterone administration the respective derivatives were detected in the glucuronide fraction. From their detection times in the urine 4-chloro-17β-hydroxymethyl-17α-methyl-18-norandrosta-1,4,13-trien-3-one (after DHCMT) and 17β-hydroxymethyl-17α-methyl-18-nor-5α-androsta-1,13-dien-3-one (after Methyl-1-testosterone) may serve as supplementary tools in doping control while 17β-hydroxymethyl-17α-methyl-18-norandrosta-1,4,13-trien-3-one appeared to be excreted only shortly after administration of Methyltestosterone. Thus, its detection may only be suitable as supplement in tracing Methyltestosterone administration. The new metabolites are characterised by mass spectrometric techniques.

Following the administration of Bolasterone, Methandriol, 17-Methyl-19-nortestosterone, Mibolerone, Oxandrolone and Stanozolol no analogous metabolites were detected. Synthesis of 17α-hydroxymethyl-17β-methyl-18-norandrosta-1,4,13-trien-3-one from androst-4-ene-3,17-dione and its NMR confirmation were successfully performed, allowing the confirmation of the stereochemistry at C-17.