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Discovery and Detection of a Designer Steroid

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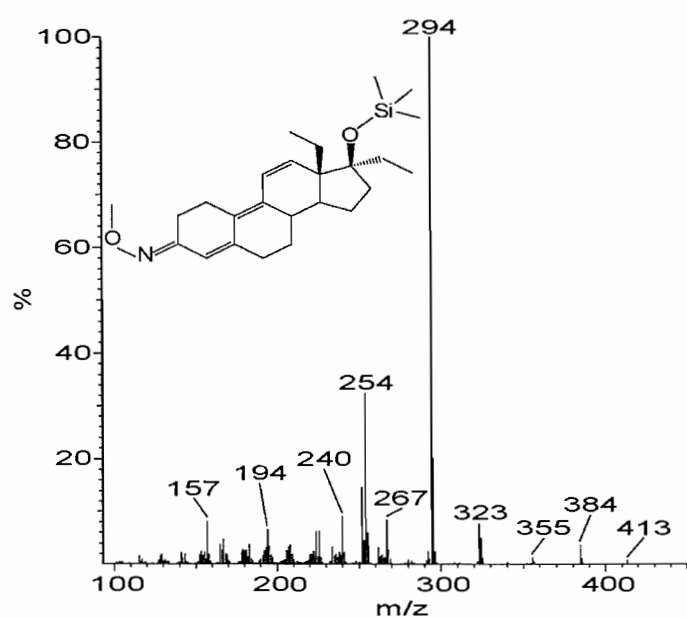
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Discovery and detection of a designer steroid

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Summary¹

Tetrahydrogestrinone (18 α -homo-pregna-4,9,11-trien-17 β -ol-3-one or THG) was identified in the residue of a used syringe that had allegedly contained an anabolic steroid undetectable by routine sport doping control urine tests. THG was synthesized by catalytic hydrogenation of gestrinone, and its structure established by mass spectrometry and NMR spectroscopy. We developed and evaluated a sensitive and specific method for rapid screening of urine samples for underivatized THG by LC/MS/MS (using transitions m/z 313 to 241 and 313 to 159) and a confirmation method by GC/HRMS analysis of the combination trimethylsilyl ether-oxime (MOX-TMS) derivative of THG (using fragments m/z 240.14, 254.15, 267.16, and 294.19). A baboon excretion study showed that IV and IM injections of THG result in substantial concentrations of THG in urine.



Mass spectrum of THG MOX-TMS

Reference

1. Catlin DH, Sekera MH, Ahrens BD, Starcevic B, Chang Y-C, Hatton CK. Tetrahydrogestrinone: discovery, synthesis, and detection in urine.

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