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Screening for metabolically stable aryl-propionamide-derived selective androgen receptor modulators for doping control purposes.

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Anabolic agents have been among the most frequently detected drugs in amateur and professional sport. A novel class of therapeutics presumably complementing anabolic steroids in the near future includes so-called selective androgen receptor modulators (SARMs) that have been under clinical investigations for several years. Although not yet commercially available, their potential for misuse in sports is high. Four aryl-propionamide-derived SARMs were synthesized in order to establish a fast and robust screening procedure using liquid chromatography/electrospray ionization tandem mass spectrometry. Synthesized compounds were characterized by high-resolution/high-accuracy mass analysis employing a linear ion trap-Orbitrap hybrid mass spectrometer while routine analyses were conducted on a triple-quadrupole mass spectrometer. Characteristic product ions obtained by collision-induced dissociation were found at m/z 289 and 261 as well as m/z 269 and 241 representing the bisubstituted aniline residues of selected model compounds. Assay validation was performed regarding lower limit of detection (1 ng/mL), recovery (85-105%), intraday precision (7.6-11.6%) and interday precision (9.9-14.4%), and precursor ion scan experiments on diagnostic product ions enabled the detection of a structurally related compound at 50 ng/mL.

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