

Athletes Abuse Non-Approved Therapeutic Compounds For Performance Gains

Non-steroidal and tissue-selective anabolic agents such as Selective Androgen Receptor Modulators (SARMs) are commonly being sold on the black market because of their performance enhancing qualities. This finding was revealed by researchers from the German Sport University Cologne in Germany in a study appearing in an issue of *Drug Testing and Analysis* published by [Wiley-Blackwell](#).

In a product sold via the internet, the availability of authentic Selective Androgen Receptor Modulators was demonstrated for the first time by the detection of the drug candidate Andarine. SARMs represent a class of therapeutics that are used for treating health conditions like osteoporosis, benign prostatic hyperplasia (BPH), sarcopenia, and cancer cachexia. However, none of the agents are approved for therapeutic use though SARMs are gaining widespread popularity in the sport doping communities as it is believed that they offer the advantages of traditional [anabolic androgenic steroids](#) like Testosterone with fewer unwanted side effects.

The World Anti-Doping Agency (WADA) prohibited the use of SARMs in sports in 2008 because of their potential for misuse. The World Anti-Doping Agency is in constant touch with drug evaluation bodies, medicine agencies, and pharmaceutical and biotechnological companies on the issues of therapeutics being misused in sports. The preventive approach of WADA was validated with the finding of non-approved arylpropionamide-derived SARM termed Andarine that was commercially available. Declared as green tea extracts and face moisturizer to pass customs, this product was available on the internet for a low price.

Mario Thevis, Ph.D., and colleagues, analyzed the advertised product using state-of-the-art mass spectrometric approaches with high resolution/high accuracy (tandem) mass spectrometry for proving that SARMs lacking clinical approval are distributed and potentially misused in sports. Dr. Thevis said one unit (30 mL) was purchased online and delivered in a box labeled to contain face moisturizer and green tea extract and the sealed bottle did not declare any content and no further documents accompanied package.

Dr. Thevis explained that LC-MS (/MS) analysis of this solution disclosed the presence of S-4 at approximately 150 mg/mL with equal amounts in each container, yielding a total of 4.5 g of the Selective Androgen Receptor Modulator. The active ingredient was identified and characterized by comparison to synthesized reference material regarding retention time and production mass spectrum, its elemental composition (via high resolution/high accuracy mass spectrometry), and elucidation of its mass spectrometric behavior. It was also noted that a considerable amount of byproduct was observed besides the detection of the active ingredient S-4. Dr. Thevis said major concerns result from these findings and added that this product with considerable anabolic properties is readily available without sufficient research on its undesirable effects and this is especially significant where uncontrolled dosing is applied and drug impurities with unknown effects are present in considerable amounts as observed in the studied

material. Dr. Thevis concluded our study demonstrates once more that the misuse of therapeutics without clinical approval by athletes cannot be dismissed.

The issue was addressed at the Conference of Parties to the International Convention against [Doping in Sport](#), at the United Nations Educational, Scientific and Cultural Organization's (UNESCO) headquarters in Paris.