Isolation, Identification, and Determination of Designer Anabolic Steroids Commonly Found in Dietary Supplements

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INTRODUCTION

The marketing of so-called "herbal" dietary supplements for athletes seeking to increase muscle mass, strength, endurance, and recovery has increased dramatically in recent years. Similar drug testing regulations have prompted some supplement manufacturers to use chemical terms to describe the use of existing anabolic steroids in an attempt to evade detection. These "designer" steroids are intended to be so distinct from standard hormones in the body that drugs testing laboratories cannot determine their exact origins. As a result, these compounds are not currently regulated. It is unclear how these compounds can be synthesized, as they do not appear in any known reference standards. We have learned that many supplement manufacturers have begun using chemically similar "designer" steroids in their products to increase muscle mass, strength, endurance, and recovery time has increased significantly. The potential for misuse of these substances is enormous, and the consequences of abuse are both serious and life-threatening.

A PORTION OF THE COLLECTED FRACTION WAS INJECTED (USING A SMALLER INJECTION PORT) FOR GC ANALYSIS USING A 100-A TO 150-MM COLUMN WITH A 5-µM CARTRIDGE. A 145-Å VARIATION OF THIS GC COLUMN WAS USED TO SEPARATE ALL COMPONENTS OF THE SAMPLE. THE SUSPECT SAMPLE WAS CONSISTENT WITH THE PRESENCE OF THE SUBLASTIC COMPOUND, AND A PEAK WITH A RETENTION TIME OF 20.95 MINUTES WAS SEEN BY GC-MS AND LC-MS, RESPECTIVELY.

RESULTS: INITIAL SCREENING

The previously described approach was used to isolate and identify a "suspect" component from the GC-MS screen of the suspect sample using both 1H and 13C NMR. A 2D HSQC NMR Spectrum Overlay of the "epistane" spot indicated that the peak corresponded to a known "epistane." No additional peaks were detected using this method.

REFERENCES