



A116 Detection of Anabolic Steroids and Related Compounds in Black Market Samples

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After attending this presentation, attendees will have been presented with the techniques used by the FDA's Forensic Chemistry Center (FCC) for analyzing black market anabolic steroids and other related compounds.

This presentation will impact the forensic community by presenting an analytical roadmap for those in the general forensic chemistry community who may encounter similar cases.

This presentation will highlight the cases received, as well as the analytical approaches used by the FCC to quickly and accurately identify anabolic steroids, masking agents and related compounds in evidence linked to underground steroid labs.

The Anabolic Steroid Control Acts were passed in 1990 and 2004, placing 59 anabolic steroids, as well as any salt, ester or ether of each, in schedule III of the Controlled Substances Act. Their passage, coupled with America's obsession with body image, has spawned a network of black market steroid labs that gross close to \$500 million dollars annually. The FCC receives sample submissions from all over the U.S. in cases related to production, importation, and distribution of anabolics and other pharmaceuticals used in conjunction with these types of steroids. Most recently, the FCC participated in the analysis of some of the 11.4 million steroid dosage units seized internationally as part of Operation Raw Deal, a joint DEA, FDA, and USFIS investigation.

Evidence received by the FCC includes anabolic steroids as injectable preparations, oral dosage forms, and topical creams. In addition, many of these steroids encountered at the FCC are foreign-labeled, mislabeled or unlabeled. The FCC is able to differentiate in excess of 120 different steroids, with testosterone, methandrostenolone, nandrolone, and stanozolol most frequently encountered. Identification of these anabolic steroids and other related compounds is typically performed using different chromatographic techniques coupled with mass selective detection.

Abuse of anabolic steroids by athletes and bodybuilders is often accompanied by the use of other drugs. Commonly encountered with these sample submissions are phosphodiesterase-5 inhibitors (such as sildenafil and its analogs), selective estrogen receptor modulators (such as tamoxifen and clomiphene), and diuretics (such as hydrochlorothiazide and spironolactone). The presence of these other classes of drugs can complicate analyses targeted exclusively at steroids.

These examples are presented as an analytical roadmap for those in the general forensic chemistry community who may encounter similar cases.

Anabolic Steroids, Black Market, Masking Agents