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- JANUARY 2010 -

- CHANGES TO *MICROGRAM BULLETIN* POSTING -

Starting with the January 2010 issue, *Microgram Bulletin* on www.dea.gov will now contain Scheduling Updates, Safety Alerts, Selective References, Meeting Announcements, Employment Opportunities, The Journal/Textbook Collection Exchange, and Training Opportunities. Intelligence Alerts and Briefs will only be found in *Microgram Bulletin LE* (Law Enforcement) edition.

Microgram Bulletin LE will be posted on Law Enforcement Online (LEO), www.leo.gov (criteria for membership and applications for membership can be found at www.leo.gov/membership_criteria.pdf and www.leo.gov/usrApp.html). LEO is a free, interactive, computer-communications service provided by the FBI. It provides an Internet accessible focal point for electronic Sensitive But Unclassified (SBU) communication and information sharing for the international, federal, state, local, and tribal law enforcement agencies. LEO also supports antiterrorism, intelligence, law enforcement, criminal justice, and public safety communities worldwide.

Those who do not meet the criteria for membership at LEO can apply for access to *Microgram Bulletin LE* through the Department of Justice's information exchange website (IDEA). Access to IDEA will be granted only to government and scientific professionals who have a demonstrated professional need to have access to *Microgram Bulletin LE* and who cannot qualify for access to www.leo.gov. If you are requesting access to *Microgram Bulletin LE* through IDEA, you will need to email your request to the Microgram Editor.

- SCHEDULING UPDATE -

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: December 4, 2009 (Volume 74, Number 232) (Rules and Regulations) (Pages 63603-63610) for the complete text of the ruling.]

DEPARTMENT OF JUSTICE

Drug Enforcement Administration

21 CFR Part 1300

[Docket No. DEA-285F] RIN 1117-AB17

Classification of Three Steroids as Schedule III Anabolic Steroids Under the Controlled Substances Act

AGENCY: Drug Enforcement Administration (DEA), Department of Justice.

ACTION: Final rule.

SUMMARY: With the issuance of this final rule, the Deputy Administrator of the Drug Enforcement Administration (DEA) classifies the following three steroids as "anabolic steroids" under the Controlled Substances Act (CSA): Boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione. These steroids and their salts, esters, and ethers are schedule III controlled substances subject to the regulatory control provisions of the CSA.

DATES: Effective Date: January 4, 2010.

FOR FURTHER INFORMATION CONTACT: Christine A. Sannerud, Ph.D., Chief, Drug and Chemical Evaluation Section, Drug Enforcement Administration, 8701 Morrissette Drive, Springfield, VA 22152, (202) 307-7183.

SUPPLEMENTARY INFORMATION:

I. Background Information

In a Notice of Proposed Rulemaking (NPRM) (73 FR 22294) published April 25, 2008, the DEA proposed the classification of three steroids as schedule III anabolic steroids under the CSA. These three steroids included boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione. With the publication of this Final Rule, DEA classifies these three steroids as schedule III anabolic steroids. Background information in support of this Final Rule is provided below.

On November 29, 1990, the President signed into law the Anabolic Steroids Control Act of 1990 (Title XIX of Pub. L. 101-647), which became effective February 27, 1991. This law established and regulated anabolic steroids as a class of drugs under schedule III of the CSA. As a result, a new anabolic steroid is not scheduled according to the procedures set out in 21 U.S.C. 811, but can be administratively classified as an anabolic steroid through the rulemaking process by adding the steroid to the regulatory definition of an anabolic steroid in 21 CFR 1300.01(b)(4).

On October 22, 2004, the President signed into law the Anabolic Steroid Control Act of 2004 (Pub. L. 108-358), which became effective on January 20, 2005. Section 2(a) of the Anabolic Steroid Control Act of 2004 amended 21 U.S.C. 802(41)(A) by replacing the existing definition of "anabolic steroid." The Anabolic Steroid Control Act of 2004 classifies a drug or hormonal substance as an anabolic steroid if the following four criteria are met: (A) The substance is chemically related to testosterone; (B) the substance is pharmacologically related to testosterone; (C) the substance is not an estrogen, progestin, or a corticosteroid; and (D) the substance is not dehydroepiandrosterone (DHEA). Any substance that meets the criteria is considered an anabolic steroid and must be listed as a schedule III controlled substance. DEA finds that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione meet this definition of anabolic steroid and is adding them to the list of

anabolic steroids in 21 CFR 1300.01(b)(4).

Anabolic steroids are a class of drugs with a basic steroid ring structure that produces anabolic and androgenic effects. The prototypical anabolic steroid is testosterone. Anabolic effects include promoting the growth of muscle. The androgenic effects consist of promoting the development of male secondary sexual characteristics such as facial hair, deepening of the voice, and thickening of the skin.

In the United States, only a small number of anabolic steroids are approved for either human or veterinary use. Approved medical uses for anabolic steroids include treatment of androgen deficiency in hypogonadal males, adjunctive therapy to offset protein catabolism associated with prolonged administration of corticosteroids, treatment of delayed puberty in boys, treatment of metastatic breast cancer in women, and treatment of anemia associated with specific diseases (e.g., anemia of chronic renal failure, Fanconi's anemia, and acquired aplastic anemia). However, with the exception of the treatment of male hypogonadism, anabolic steroids are not the first-line treatment due to the availability of other preferred treatment options. DEA is not aware of any legitimate medical use or New Drug Applications (NDA) for the three substances that DEA is classifying as anabolic steroids under the definition set forth under 21 U.S.C. 802(41)(A). Moreover, DEA has not identified any chemical manufacturers currently using these substances as intermediates in their manufacturing process(es).

Adverse effects are associated with the use or abuse of anabolic steroids. These effects depend on several factors (e.g., age, sex, anabolic steroid used, the amount used, and the duration of use). In early adolescence, the use of testosterone and other anabolic steroids that have estrogenic effects can cause premature closure of the growth plates in long bones resulting in a permanently stunted growth. In adolescent boys, anabolic steroid use can cause precocious sexual development. In both girls and women, anabolic steroid use induces permanent physical changes such as deepening of the voice, increased facial and body hair growth, and the lengthening of the clitoris. In men, anabolic steroid use can cause shrinkage of the testicles, decreased sperm count, and sterility. Gynecomastia (i.e., enlargement of the male breast tissue) can develop with the use of those anabolic steroids with estrogenic actions. In both men and women, anabolic steroid use can damage the liver and can cause high cholesterol levels, which may increase the risk of strokes and heart attacks. Furthermore, anabolic steroid use is purported to induce psychological effects such as aggression, increased feelings of hostility, and psychological dependence and addiction. Upon abrupt termination of long-term anabolic steroid use, a withdrawal syndrome may appear including severe depression.

II. Evaluation of Statutory Factors for Classification as an Anabolic Steroid

With the issuance of this Final Rule, DEA is classifying boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione as anabolic steroids under the definition set forth under 21 U.S.C. 802(41)(A). As noted previously, a drug or hormonal substance is classified as an anabolic steroid by meeting the following four definitional requirements: (A) The substance is chemically related to testosterone; (B) the substance is pharmacologically related to testosterone; (C) the substance is not an estrogen, progestin, or a corticosteroid; and (D) the substance is not DHEA.

(A) Chemically Related to Testosterone

To classify a substance as an anabolic steroid, a substance must be chemically related to testosterone. DEA discussed its evaluation of the chemical relationship of boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione in the NPRM published April 25, 2008 (73 FR 22294). A Structure Activity Relationship (SAR) evaluation for each of the substances compared the chemical structure of the steroid to that of testosterone, as substances with a structure similar to that of testosterone are predicted to possess comparable pharmacological and biological activity.

Boldione is also known by the following chemical name: Androsta-1,4-diene-3,17-dione. DEA has determined that the chemical structure of boldione is chemically related to that of testosterone. The chemical structure of boldione differs from testosterone by only the following structural features: A ketone group at carbon 17 and a double bond between the carbon 1 and carbon 2. The human body would be expected to metabolize the ketone group at carbon 17 into a hydroxyl group that is present on testosterone (Payne and Hales, 2004; Peltoketo et al., 1999; Moghrabi and Andersson, 1998). Furthermore, the scientific literature reports that the additional double bond at carbon 1 in boldione does not significantly decrease the anabolic activity of the substance (Vida, 1969). Boldione is an anabolic steroid precursor, being metabolized by the body into boldenone (Galletti and Gardi,

1971; Kim et al., 2006), which is a schedule III anabolic steroid (21 U.S.C. 802(41)(A)(vi)).

Desoxymethyltestosterone (DMT) is also known by the following names: 17[alpha]-Methyl-5[alpha]-androst-2-en-17[beta]-ol; and madol. DEA has determined that the chemical structure of desoxymethyltestosterone is chemically related to testosterone. The chemical structure of desoxymethyltestosterone differs from testosterone by the following four structural features: The lack of a ketone group at the third carbon, a double bond between the second and third carbon, the lack of a double bond between the fourth and fifth carbon, and a methyl group at carbon 17. Each of these four chemical features is known through the scientific literature not to eliminate the anabolic and androgenic activity of the substance (Brueggemeir et al., 2002; Vida, 1969).

19-Nor-4,9(10)-androstadienedione is also known by the following chemical names: 19-Norandrosta-4,9(10)-diene-3,17-dione; and estra-4,9(10)-diene-3,17-dione. DEA has determined that the chemical structure of 19-nor-4,9(10)-androstadienedione is chemically related to testosterone. The chemical structure of 19-nor-4,9(10)-androstadienedione differs from testosterone by the following three structural features: A ketone group at carbon 17, the absence of a methyl group at carbon 19, and a double-bond between carbon 9 and carbon 10. The human body would be expected to metabolize the ketone group at carbon 17 into a hydroxyl group like that present in testosterone (Payne and Hales, 2004; Peltoketo et al., 1999; Moghrabi and Andersson, 1998). Furthermore, the scientific literature reports that both the absence of the methyl group at carbon 19 and the additional double bond in 19-nor-4,9(10)-androstadienedione increase the anabolic activity of the substance (Vida, 1969).

(B) Pharmacologically Related to Testosterone

A substance must also be pharmacologically related to testosterone (i.e., produce similar biological effects) to be classified as a schedule III anabolic steroid. The pharmacology of a steroid, as related to testosterone, can be established by performing one or more of the following androgenic and anabolic activity assays: Ventral prostate assay, seminal vesicle assay, levator ani assay, testicular atrophy assay, gonadotropin suppression assay, and androgen receptor binding and efficacy assays. These assays are described below.

Ventral Prostate Assay, Seminal Vesicle Assay, and Levator Ani Assay: The classic scientific procedure for examining the effects of a steroid as compared to testosterone is to perform the testosterone sensitive assays, ventral prostate assay, seminal vesicle assay, and levator ani assay in rats. Certain male accessory organs (i.e., the ventral prostate, seminal vesicles, and levator ani muscle) specifically need testosterone to grow and remain healthy. Upon the removal of the testes (i.e., castration), the primary endogenous source of testosterone is eliminated causing the atrophy of the ventral prostate, seminal vesicles, and levator ani muscle (Eisenberg et al., 1949; Nelson et al., 1940; Scow, 1952; Wainman and Shipounoff, 1941). Numerous scientific studies have demonstrated the ability of exogenous testosterone administered to rats following castration to maintain the normal weight and size of all three testosterone sensitive tissues (Biskind and Meyer, 1941; Dorfman and Dorfman, 1963; Kincl and Dorfman, 1964; Nelson et al., 1940; Scow, 1952; Wainman and Shipounoff, 1941). Thus, a steroid with testosterone-like activity will also prevent the atrophy of these three testosterone-dependent tissues in castrated rats.

Testicular Atrophy Assay: Administering testosterone to non-castrated rats causes a decrease in serum levels of gonadotropins (i.e., luteinizing hormone [LH] and follicle stimulating hormone [FSH]) from normal levels. Gonadotropins are pituitary hormones that affect the size and function of the testes. The suppression of these gonadotropins by excess testosterone results in a significant decrease in the size and weight of the testes (Boris et al., 1970; McEuen et al., 1937; Moore and Price, 1938). Accordingly, a steroid with testosterone-like activity will also significantly diminish the size and weight of the testes.

Gonadotropin Suppression Assay: The castration of rats causes a substantial increase in the serum levels of gonadotropins (i.e., LH and FSH) above normal levels due to the removal of the principal source of endogenous testosterone (Gay and Bogdanove, 1969; Swerdloff et al., 1972, 1973; Swerdloff and Walsh, 1973). The administration of testosterone to castrated animals suppresses the increase in the serum levels of gonadotropins (Gay and Bogdanove, 1969; Swerdloff et al., 1972; Swerdloff and Walsh, 1973; Verjans et al., 1974). The administration of anabolic steroids with testosterone-like activity will also prevent this increase in serum levels of LH and FSH.

Androgen Receptor Binding and Efficacy Assay: Androgen receptor binding and efficacy assays are also used to

demonstrate that the activity of a steroid is similar to that of testosterone. Testosterone produces its anabolic effects subsequent to binding to and activating the androgen receptor. Different cell-based assays can compare candidate steroids to testosterone for their ability to bind to and activate androgen receptors.

There are several different types of assays used to establish androgen receptor binding and efficacy. In one assay, C3H10T1/2 stem cells express androgen receptors and are used to assess steroids for their ability to bind and activate the androgen receptor (Jasuja et al., 2005a,b; Singh et al., 2003). In these stem cells, the translocation of the androgen receptor to the nucleus of the cell in the presence of the ligand (e.g., testosterone or its active metabolite dihydroxytestosterone) confirms that the ligand bound to the androgen receptor and activated the downstream signaling cascade. When activated, the C3H10T1/2 stem cells differentiate into skeletal muscle cells as demonstrated by the increase in the expression of muscle specific proteins (i.e., myogenic determination transcription factor [MyoD] and myosin heavy chain [MHC]). Another assay uses human breast cancer cells genetically altered to contain a specific reporter gene (e.g., luciferase gene) regulated by androgen receptor activation (Hartig et al., 2002; Wilson et al., 2002). The expression of a bioluminescent protein (e.g., luciferase) signals both androgen receptor binding and activation.

Results of the Androgenic and Anabolic Activity Assays: As discussed in the NPRM, in January 2006, DEA reviewed the published scientific literature for pharmacological data on the anabolic and androgenic activity of boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione using the assays described above. As discussed further below, there was sufficient information on the pharmacology of desoxymethyltestosterone in the reviewed scientific literature to determine that desoxymethyltestosterone is pharmacologically related to testosterone (i.e., produces biological effects similar to those of testosterone). However, the published literature contained insufficient pharmacological data to determine whether boldione and 19-nor-4,9(10)-androstadienedione were pharmacologically related to testosterone. Consequently, as discussed further below and in the NPRM, DEA sponsored pharmacological studies involving several different androgenic and anabolic activity assays to generate the data necessary to make this determination.

Androgenic and anabolic activity assay results indicate that boldione, desoxymethyltestosterone, and 19-nor-4,9 (10)-androstadienedione have similar pharmacological activity as testosterone.

Boldione

DEA sponsored a study \1\ by the Veteran's Administration Puget Sound Health Care System to determine the anabolic and androgenic effects of boldione in intact and castrated rats (Matsumoto and Marck, 2006). The results of these studies were compared to the results of a study by the same laboratory using a similar protocol to characterize the androgenic and anabolic effects of testosterone (Marck et al., 2003). Boldione administered to castrated male rats by silastic capsules implanted under the skin prevented atrophy of the ventral prostate, seminal vesicles, levator ani muscle, and the rise in serum gonadotropin (LH and FSH) associated with castration. Boldione administration also produced testicular atrophy in intact rats. Another DEA sponsored study \2\ at a laboratory at Boston University examined the ability of boldione to bind to the androgen receptor and to cause the differentiation of C3H10T1/2 stem cells into muscle cells (Bhasin, 2005). All of these effects caused by boldione in C3H10T1/2 stem cells were comparable to those of testosterone as established in experiments using the same or similar methodology (Singh et al., 2003). Collectively, the evidence indicates that the pharmacology of boldione is similar to testosterone.

[\1\ The study by the Veteran's Administration Puget Sound Health Care System may be found at http://www.regulations.gov in the electronic docket associated with this rulemaking. \2\ The study by Boston University may be found at http://www.regulations.gov in the electronic docket associated with this rulemaking.]

Desoxymethyltestosterone

Desoxymethyltestosterone was administered subcutaneously, orally, or intramuscularly to castrated rats (Dorfman and Kincl, 1963; Kincl and Dorfman, 1964; Nutting et al., 1966). By all three routes of administration, desoxymethyltestosterone prevented the atrophy of ventral prostate, seminal vesicles, and levator ani muscle. Desoxymethyltestosterone also induced the expression of the bioluminescent protein luciferase in CAMA-1 breast cancer cells signaling androgen receptor binding and activation (Ayotte et al., 2006). Collectively, the evidence indicates that the pharmacology of desoxymethyltestosterone is similar to testosterone. 19-Nor-4,9(10)-Androstadienedione

As discussed in the NPRM, DEA sponsored a study \3\ by the Veteran's Administration Puget Sound Health Care

System to determine the anabolic and androgenic effects of 19-nor-4,9(10)-androstadienedione in intact and castrated rats (Matsumoto and Marck, 2006). The results of these studies were compared to the results of a study by the same laboratory using a similar protocol to characterize the androgenic and anabolic effects of testosterone (Marck et al., 2003). 19-Nor-4,9(10)-androstadienedione administered to castrated male rats by silastic capsules implanted under the skin prevented the atrophy of the ventral prostate, seminal vesicles, levator ani muscle, and the rise in serum gonadotropins (LH and FSH) associated with castration. Another DEA sponsored study at a laboratory at Boston University \4\ examined the ability of 19-nor-4,9(10)-androstadienedione to bind to the androgen receptor and to cause the differentiation of C3H10T1/2 stem cells into muscle cells (Bhasin, 2005). 19-Nor-4,9(10)-androstadienedione induced the translocation of the androgen receptor to the nucleus of the C3H10T1/2 stem cells, demonstrating binding affinity and efficacy for the androgen receptor. All of these effects caused by 19-nor-4,9(10)-androstadienedione in C3H10T1/2 stem cells were comparable to those of testosterone as established in experiments using the same or similar methodology (Singh et al., 2003). Collectively, the evidence indicates that the pharmacology of 19-nor-4,9(10)-androstadienedione is similar to testosterone.

[\3\ The study by the Veteran's Administration Puget Sound Health Care System may be found at http://www.regulations.gov in the electronic docket associated with this rulemaking. \4\ The study by Boston University may be found at http://www.regulations.gov in the electronic docket associated with this rulemaking.]

(C) Not Estrogens, Progestins, and Corticosteroids

As discussed in the NPRM, DEA has determined that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione are unrelated to estrogens, progestins, and corticosteroids. DEA evaluated the SAR for each of the substances. The chemical structure of each substance was compared to that of estrogens, progestins, and corticosteroids because the chemical structure can be related to its pharmacological and biological activity. DEA found that the three substances lacked the necessary chemical structures to impart significant estrogenic activity (e.g., aromatic A ring) (Duax et al., 1988; Jordan et al., 1985; Williams and Stancel, 1996), progestational activity (e.g., 17[beta]-alkyl group) (Williams and Stancel, 1996), or corticosteroidal activity (e.g., 17-ketone group or 11 [beta]-hydroxyl group) (Miller et al., 2002).

(D) Not Dehydroepiandrosterone

Dehydroepiandrosterone, also known as DHEA, is exempt from control as an anabolic steroid by definition (21 U.S.C. 802(41)(A)). Boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione are not dehydroepiandrosterone and are therefore not exempted from control on this basis.

III. Comments Received

[Editor's Note: See the Federal Register for comments received and DEA's response to said comments.]

IV. Conclusion and Impact of Final Rule

Conclusion

Therefore, based on the above, DEA concludes that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione meet the CSA definition of "anabolic steroid" because each substance is: (A) Chemically related to testosterone; (B) pharmacologically related to testosterone; (C) not an estrogen, progestin, or a corticosteroid; and (D) not DHEA (21 U.S.C. 802(41)(A)). All anabolic steroids are classified as schedule III controlled substances (21 U.S.C. 812(e) schedule III). Once a substance is determined to be an anabolic steroid, DEA has no discretion regarding the scheduling of these substances. As discussed further below, upon the effective date of this Final Rule all requirements pertaining to controlled substances in schedule III pertain to these three substances.

[Editor's Note: See the Federal Register for Impact of Final Rule.]

List of Subjects in 21 CFR Part 1300

Chemicals, Drug traffic control.

For the reasons set out above, 21 CFR Part 1300 is amended as follows:

PART 1300--DEFINITIONS

1. The authority citation for part 1300 continues to read as follows:

Authority: 21 U.S.C. 802, 821, 829, 871(b), 951, 958(f).

2. Section 1300.01 is amended in paragraph (b)(4) by:

A. Redesignating paragraphs (b)(4)(xiii) through (b)(4)(lx) as (b)(4)(xiv) through (b)(4)(lxi),

B. Adding a new paragraph (b)(4)(xiii),

C. Further redesignating newly designated paragraphs (b)(4)(xvii) through (b)(4)(lxi) as (b)(4)(xviii) through (b)(4)(lxii),

D. Adding new paragraph (b)(4)(xvii),

E. Further redesignating newly designated paragraphs (b)(4)(xlvii) through (b)(4)(lxii) as (b)(4)(xlviii) through (b)(4)(lxiii), and

F. Adding new paragraph (b)(4)(xlvii) to read as follows:

Sec. 1300.01 Definitions relating to controlled substances.

* * * * *
(b) * * *
(4) * * *
(xiii) boldione (androsta-1,4-diene-3,17-dione) * * * * *
(xvii) desoxymethyltestosterone (17[alpha]-methyl-5[alpha]-androst- 2-en-17[beta]-ol) (a.k.a., madol)
* * * * *
(xlvii) 19-nor-4,9(10)-androstadienedione (estra-4,9(10)-diene- 3,17-dione)
* * * * *

Dated: November 20, 2009.

Michele M. Leonhart,
Deputy Administrator.

List of References

[Editor's Note: See the Federal Register for list of references.]

[FR Doc. E9-28572 Filed 12-3-09; 8:45 am]

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SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Belal T, Awad T, Clark CR, De Ruiter J. **GC/MS evaluation of a series of acylated derivatives of 3,4-methylenedioxymethamphetamine.** Journal of Chromatographic Science 2009;47(5):359-364. [Editor's Notes: The mass spectral properties of the acetyl, propionyl, and butyryl derivatives of 3,4-methylenedioxymethamphetamine (MDMA) all show a base peak at *m/z* 58, which is the base peak for the underivatized MDMA. All acylated derivatives provide mass spectral information (*m/z* 162) to identify the three-carbon side chain for MDMA. The perfluoroalkyl amides yield several unique mass spectral fragments for specific identification of MDMA. MS fragmentation pathways are illustrated and validated using analogous deuterated derivatives. Contact: Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Alexandria University, Alexandria 21521, Egypt.]

2. De Backer B, Debrus B, Lebrun P, Theunis L, Dubois N, Decock L, Verstraete A, Hubert P, Charlier C. **Innovative development and validation of an HPLC/DAD method for the qualitative and quantitative determination of major cannabinoids in cannabis plant material.** Journal of Chromatography, B: Analytical Technologies in the Biomedical and Life Sciences 2009;877(32):4115-4124. [Editor's Notes: A simple and accurate HPLC/DAD method was developed for the quantification of major neutral and acidic cannabinoids present in cannabis plant material: Δ^9-Tetrahydrocannabinol (THC), THC acid (THCA), cannabidiol (CBD), CBD acid (CBDA), cannabigerol (CBG), CBG acid (CBGA), cannabinol (CBN), and Δ^8-tetrahydrocannabinol (Δ^8-THC). Contact: Laboratory of Clinical, Forensic and Environmental Toxicology, CIRM, CHU Sart-Tilman, University of Liege, Liege B-4000, Belgium.]

3. McIlhenny EH, Pipkin KE, Standish LJ, Wechkin HA, Strassman R, Barker SA. **Direct analysis of psychoactive tryptamine and harmala alkaloids in the Amazonian botanical medicine ayahuasca by liquid chromatography-electrospray ionization-tandem mass spectrometry.** Journal of Chromatography, A 2009;1216(51):8960-8968. [Editor's Notes: A direct injection/liquid chromatography-electrospray ionization-tandem mass spectrometry procedure has been developed for the simultaneous quantitation of 11 compounds potentially found in the increasingly popular Amazonian botanical medicine and religious sacramental beverage ayahuasca. Its application to the analysis of three different ayahuasca preparations is also described. Contact: Department of Comparative Biomedical Sciences, School of Veterinary Medicine, Skip Bertman Drive at River Road, Louisiana State University, Baton Rouge, LA 70803, USA.]

Additional References of Possible Interest:

1. Pistos C, Karampela S, Papoutsis I, Athanaselis S, Spiliopoulou Ch, Maravelias C. **Investigation of the identification point system adaptation in cocaine, benzoylecgonine and ecgonine methyl ester using a single quadrupole mass spectrometer.** Rapid Communications in Mass Spectrometry 2009;23(23):3772-3780. [Editor's Notes: At present, no official criteria exist for drug identification using single quadrupole mass spectrometers, although the European Union (EU) criteria for compound identification have been adopted. These criteria are evaluated with respect to the confirmation of cocaine and its metabolites by single quadrupole liquid chromatography/mass spectrometry (LC/MS), and problems are highlighted. Contact: Laboratory of Forensic Medicine and Toxicology, Medical School, University of Athens, Athens, Greece.]

2. Schneiders S, Holdermann T, Dahlenburg R. **Comparative analysis of 1-phenyl-2-propanone (P2P), an amphetamine-type stimulant precursor, using stable isotope ratio mass spectrometry presented in part as a poster at the 2nd meeting of the Joint European Stable Isotope User Meeting (JESIUM), Giens, France, September 2008.** Science & Justice 2009;49(2):94-101. [Editor's Notes: 1-Phenyl-2-propanone (P2P) is a commonly used precursor for clandestine production of amphetamine and methamphetamine. The study's aim was to determine the variation of the isotope ratios within precursor samples from one manufacturer and to compare seized samples of unknown sources to these values. The comparison of all seized samples to the data of the samples of one manufacturer revealed considerable differences. Contact: Forensic Science Institute, Unit Central Analytics II (KT 12), Bundeskriminalamt (Federal Criminal Police Office), Wiesbaden D-65173, Germany.]

3. Tsujikawa K, Kuwayama K, Miyaguchi H, Kanamori T, Iwata YT, Inoue H. **Degradation of N-hydroxy-3,4-methylenedioxymethamphetamine in aqueous solution and its prevention.** Forensic Science International 2009;193(1-3):106-111. [Editor's Notes: Presents title study. Contact: National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]

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Physician's Desk Reference 2008 Edition

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THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 1-5, 2010
May 31-June 4, 2010
September 13-17, 2010

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin* (see: http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf). Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head).

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SCIENTIFIC MEETINGS

Title: 2010 Mid-Atlantic Association of Forensic Scientists Annual Meeting
Sponsoring Organization: Mid-Atlantic Association of Forensic Scientists
Inclusive Dates: May 17-21, 2010
Location: Penn State University (State College, PA)
Contact Information: maafs@comcast.net
Website: www.maafs.org

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Microgram email Address Change

Effective January 1st, 2010 the email address for the *Microgram* Editor became:

DEA-Microgram-2010 -at- mailsnare.net (Replace " -at- " with "@")

The current email address (DEA-Microgram-2009 -at- mailsnare.net) will be monitored until January 31st, 2010. An automated response will direct senders to the new address until April 1st, 2010, at which point the account will lapse.

Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately "whitelist" the DEA-Microgram-2010 -at- mailsnare.net email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* (DEA-Microgram-2009 -at- mailsnare.net) be automatically filtered (blocked) after January 1st, 2010. This address will no longer be used by *Microgram* after this date; therefore, any subsequent emails from any previous *Microgram* email address will be spam.

All subscribers should notify their IT security personnel of all the above changes.

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Information and Instructions for *Microgram Bulletin*

General Information

Microgram Bulletin and *Microgram Bulletin LE* are monthly newsletters published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences. *Microgram Bulletin* is primarily intended to provide up-to-date content of interest to the forensic community including: Drug Scheduling Updates, Safety Alerts, Selective Literature References, Meeting Announcements, Employment Opportunities, The Journal and Textbook Collection Exchange, and Training Opportunities. *Microgram Bulletin LE* is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

Access to *Microgram Bulletin* and *Microgram Bulletin LE*

Microgram Bulletin LE is posted at www.leo.gov in the DEA Special Interest Group (SIG), the Department of Justice's information exchange website (IDEA). *Microgram Bulletin* is posted at www.dea.gov. At this time, *Microgram Bulletin* and *Microgram Bulletin LE* are available only electronically, and require Internet access. Professional scientific and law enforcement personnel may request email notifications when new issues are posted (such notifications are not available to private citizens). The publications themselves are never sent electronically (that is, as attachments). Requests to be added to the email notification list should preferably be submitted via email to the *Microgram* Editor at: DEA-Microgram-2010 -at- mailsnare.net. Requests can also be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/ Microgram Editor; 8701 Morrissette Drive; Springfield, VA 22152. All requests to be added to the *Microgram* email notification list should include the following **Standard Contact Information**:

* The Full Name and Mailing Address of Submitting Laboratory or Office;
* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note: that (when possible) email notifications are mailed to titles, not names, in order to avoid problems arising from future personnel changes);
* If available, the generic email address for the Submitting Laboratory or Office;
* If a generic email address is not available, **one** stable email address for a long-term employee, who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office **(Note that only one email address per Office will be honored).**

Requests to be removed from the *Microgram* email notification list, or to change an existing email address, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent Standard Contact Information detailed above, and also should provide both the previous and the new email addresses.

Email notification requests/changes are usually implemented within six weeks.

Email Notifications (Additional Comments)
The email notification indicates which issue has been posted, and additional information as appropriate. Note that *Microgram* e-notices will NEVER include any attachments, or any hyperlinks. **This is important, because the Microgram email address is routinely hijacked and used to send spam, very commonly including malicious attachments.** For this reason, all subscribers are urged to have current anti-viral, anti-spyware, and firewall programs in operation. However, in order to ensure that the email notifications are not filtered as spam, the DEA-Microgram-2010 -at- mailsnare.net email address should be "whitelisted" by the Office's ISP.

Costs
Access to *Microgram Bulletin* and *Microgram Bulletin LE* is free.

Submissions to *Microgram Bulletin* and *Microgram Bulletin LE*
Microgram Bulletin includes Safety Alerts, Selected Literature References, Meeting Announcements, Employment Opportunities, The Journal/Textbook Collection Exchange, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the general forensic community. *Microgram Bulletin LE* will also feature Intelligence Alerts and Briefs in addition to the content found in *Microgram Bulletin*. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin* or *Microgram Bulletin LE*.

All submissions must be in English. Although *Microgram Bulletin LE* is classified as law enforcement sensitive, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Microsoft Word® attachment, to: DEA-Microgram-2010 -at- mailsnare.net. *Current* versions of Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrissette Drive; Springfield, VA 22152. Hard copy mailings should be accompanied by an electronic version on an IBM® PC-compatible standard CD-R. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: "Warning - Contains Electronic Media - Do Not Irradiate"**. Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

Safety Alerts are urgent communiqués to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to

law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

Selected Literature References is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author's contact information.

Meeting Announcements list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/ forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement.

Employment Opportunities lists job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will typically be posted for 3 consecutive months, but not past the application deadline.

The Journal/Textbook Collection Exchange

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue. The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: DEA-Microgram-2010 -at- mailsnare.net. Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

Intelligence Alerts and Briefs are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected).

Selected Intelligence Briefs are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin LE* readership that have been previously published in restricted or nonrestricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002
All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

However, the entire collection, individual issues, or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

DEA Headquarters
Attn: Office of Forensic Sciences/*Microgram* Editor
8701 Morrissette Drive
Springfield, VA 22152.

Requests will be sent either by CD or in hard copy (photocopy), as appropriate.

Note that requests made via email will not be honored.

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DISCLAIMERS

1) All material published in *Microgram Bulletin, Microgram Bulletin LE,* and *Microgram Journal* is reviewed prior to publication. However, the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin, Microgram Bulletin LE,* and/or *Microgram Journal* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.

2) Due to the ease of scanning, copying, electronic manipulating, and/or reprinting, only the posted copies of *Microgram Bulletin, Microgram Bulletin LE,* and *Microgram Journal* at www.leo.gov, the Department of Justice's information exchange website (IDEA), and www.dea.gov are valid. All other copies, whether electronic or hard, are suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin, Microgram Bulletin LE,* and/or *Microgram Journal*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**