DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Secretary

Office of the Assistant Secretary for Health
Washington, D.C. 20201

MAY 17 2012

The Honorable Michele M. Leonhart
Administrator
Drug Enforcement Administration
U.S. Department of Justice
8701 Morrissette Drive
Springfield, VA 22152

Dear Ms. Leonhart:

Pursuant to the Controlled Substances Act [CSA, 21 U.S.C. § 811 (b), (c), and (f)], the Department of Health and Human Services is recommending that the substance 5-MeO-MIPT be added to Schedule I of the CSA. 5-MeO-MIPT has no known medical use in the United States, does not have an approved new drug application, and is not currently marketed anywhere in the world as an approved drug product. 5-MeO-MIPT, a structural analogue of the Schedule I hallucinogen dimethyltryptamine (DMT), elicits pharmacological effects in humans that are similar to those of other Schedule I hallucinogens with high abuse potential, including DMT, lysergic acid diethylamide (LSD), 4-methyl-2,5-dimethoxyamphetamine (DOM), and mescaline. 5-MeO-MIPT and related tryptamine hallucinogens (DMT, LSD, and DOM, all of which are Schedule I drugs) are highly abusable substances.

The Food and Drug Administration (FDA) and the National Institute on Drug Abuse have also considered the abuse potential and dependence-producing characteristics of 5-MeO-MIPT. After reviewing the available information, the agencies conclude that 5-MeO-MIPT should be controlled in Schedule I. Enclosed is a document prepared by FDA's Controlled Substance Staff that is the basis for the recommendation.

Should you have any questions regarding this recommendation, please contact Corinne P. Moody, Science Policy Analyst, Controlled Substance Staff, Center for Drug Evaluation and Research, FDA, at (301) 796-5402.

Sincerely yours,

Howard K. Koh, M.D., M.P.H.
Assistant Secretary for Health

Enclosure

Basis for the Recommendation to Control N-Isopropyl-5-Methoxy-N-Methyltryptamine (5-MeO-MIPT) and its Salts in Schedule I of the Controlled Substances Act (CSA)

A. Background

On December 19, 2008, the Drug Enforcement Administration (DEA) requested that the Department of Health and Human Services (HHS) conduct a medical and scientific evaluation of N-isopropyl-5-methoxy-N-methyltryptamine (5-MeO-MIPT) and its salts for control under Schedule I of the Controlled Substances Act (CSA). The substance 5-MeO-MIPT, a tryptamine derivative with central nervous system (CNS) hallucinogenic properties, has no known medical use in the United States, does not have an approved new drug application (NDA), and is not currently marketed anywhere in the world as an approved drug product.

Between 2002 and 2007, law enforcement authorities reported abuse of 5-MeO-MIPT in the United States, as evidenced by drug seizures, medical reports, and anecdotal reports concerning hospital emergency room admissions. Additionally, a death was reported of an individual who had consumed 5-MeO-MIPT with other drugs.

Chemically, 5-MeO-MIPT is structurally related to the Schedule I hallucinogen dimethyltryptamine (DMT). 5-MeO-MIPT has been shown to elicit pharmacological effects in humans that are similar to those of other Schedule I hallucinogens with high abuse potential including DMT, lysergic acid diethylamide (LSD), 4-methyl-2,5-dimethoxyamphetamine (DOM), and mescaline. 5-MeO-MIPT and related tryptamine hallucinogens (DMT, LSD, and DOM, all of which are Schedule I drugs) are highly abusable substances.

Pursuant to 21 U.S.C. § 811(b), the Secretary of HHS is required to consider in a scientific and medical evaluation eight factors determinative of control under the CSA. The eight factors are:

1. Its actual or relative potential for abuse;
2. Scientific evidence of its pharmacological effect, if known;
3. The state of current scientific knowledge regarding the drug or other substance;
4. Its history and current pattern of abuse;
5. The scope, duration, and significance of abuse;
6. What, if any, risk there is to the public health;
7. Its psychic or physiological dependence liability; and
8. Whether the substance is an immediate precursor of a substance already controlled under the CSA.

Following consideration of the eight factors, the Secretary of HHS must make three findings and a recommendation for scheduling a drug or substance in the CSA. The three required findings relate to a substance's abuse potential, legitimate medical use, and safety or dependence potential.

The medical and scientific evaluation of whether a substance should be recommended for control under the CSA is performed for HHS by the Food and Drug Administration (FDA), with the

concurrence of the National Institute on Drug Abuse (NIDA), as described in the Memorandum of Understanding (MOU) of March 8, 1985 (50 FR 9518-20).

This evaluation discusses the scientific and medical information relative to each of the eight factors, presents findings in the three required areas (abuse potential, legitimate medical use, and safety or dependence liability), and makes a recommendation regarding scheduling. After assessing all available data, FDA recommends that 5-MeO-MIPT (and its salts) be controlled in Schedule I of the CSA. NIDA concurs with this recommendation.

B. Evaluating 5-MeO-MIPT Under the Eight Factors

This section evaluates the scientific and medical information about 5-MeO-MIPT under the eight factors that must be considered pursuant to 21 U.S.C. § 811(c). Available information that was evaluated included scientific and medical publications on 5-MeO-MIPT, law enforcement data from seizures and surveillance of 5-MeO-MIPT, and anecdotal reports on the human use of 5-MeO-MIPT.

1. Its Actual or Relative Potential For Abuse

The term "abuse" is not defined in the CSA. However, the legislative history of the CSA[1] suggests the following points in determining whether a particular drug or substance has a potential for abuse:

a. Individuals are taking the substance in amounts sufficient to create a hazard to their health or to the safety of other individuals or to the community; or

b. There is significant diversion of the drug or substance from legitimate drug channels; or

c. Individuals are taking the substance on their own initiative rather than on the basis of medical advice from a practitioner licensed by law to administer such substance; or

d. The substance is so related in its action to a substance already listed as having a potential for abuse to make it likely that it will have the same potential for abuse as such substance, thus making it reasonable to assume that there may be significant diversions from legitimate channels, significant use contrary to or without medical advice, or that it has a substantial capability of creating hazards to the health of the user or to the safety of the community.

---

[1] Comprehensive Drug Abuse Prevention and Control Act of 1970, H.R. Rep. No. 91-1444, 91st Cong., Sess. 1 (1970) reprinted in U.S.C.C.A.N. 4566, 4603.

a. Individuals are taking the substance in amounts sufficient to create a hazard to their health or to the safety of other individuals or to the community.

Evidence that individuals are taking 5-MeO-MIPT in amounts sufficient to create a health hazard is found in one medical report in which a 25-year-old man was found dead after consuming a combination alleged to be 5-MeO-MIPT and other hallucinogens (see Factor 6). Additionally, case reports in the medical literature and anecdotal reports document that 5-MeO-MIPT is used for its hallucinogenic activity, and is responsible for hospital emergency room admissions (see Factors 2, 4, and 6). Thus, 5-MeO-MIPT presents a safety hazard to the health of individuals who consume it.

b. There is significant diversion of the drug or substance from legitimate drug channels.

As 5-MeO-MIPT is not an approved drug product in the United States and there appear to be no legitimate drug channels from which 5-MeO-MIPT can be diverted, this characteristic of abuse potential is not applicable.

c. Individuals are taking the substance on their own initiative rather than on the basis of medical advice from a practitioner licensed by law to administer such substances.

5-MeO-MIPT is not an approved drug product, so a practitioner may not legally prescribe the substance, and it cannot be dispensed to an individual. As such, individuals are using 5-MeO-MIPT without medical advice. 5-MeO-MIPT is available for purchase on the Internet and "on the street" as an illicit substance. According to the DEA and anecdotal reports (see factor 2), 5-MeO-MIPT has effects similar to the Schedule I hallucinogens DMT, LSD, DOM, and mescaline. Thus, individuals are using the unscheduled drug 5-MeO-MIPT, on their own initiative, possibly as an alternative for Schedule I hallucinogens which elicit the same effects while avoiding the criminal penalties associated with those substances.

d. The substance is so related in its action to a substance already listed as having a potential for abuse to make it likely that it will have the same potential for abuse as such substance, thus making it reasonable to assume that there may be significant diversions from legitimate channels, significant use contrary to or without medical advice, or that it has a substantial capability of creating hazards to the health of the user or to the safety of the community.

Chemically, 5-MeO-MIPT is a synthetic analogue of tryptamine, which is structurally related to other tryptamines (natural and synthetic), such as DMT. The effects and pharmacological action of 5-MeO-MIPT are therefore similar to that of other Schedule I hallucinogens, such as DMT and LSD, both of which have no accepted medical use and high abuse potential. In animal drug discrimination studies, 5-MeO-MIPT fully generalizes to the discriminative stimulus effects of DOM in rats (Rutledge, et al., 2007). 5-MeO-MIPT also partially shares discriminative stimulus effects of LSD, DMT, and 3, 4-methylenedioxymethamphetamine (MDMA), all of which are Schedule I drugs (Gatch and Forster, 2006 and 2007, Rutledge et al., 2007). In humans, 5-MeO-MIPT is 15-fold more potent than DMT when its hallucinogenic potencies were compared with other tryptamines (Jacob and Shulgin, 1984). Use of 5-MeO-MIPT is associated with emergency department admissions.

A 25-year-old man was found dead after consuming a cocktail including 5-MeO-MIPT (Sklerov et al., 2005). It is unclear from the available information whether 5-MeO-MIPT played a direct role in the death (see Factor 6).

Thus, it is reasonable to assume that 5-MeO-MIPT has substantial capability to be a hazard to the health of the user and to the safety of the community.

2. SCIENTIFIC EVIDENCE OF ITS PHARMACOLOGICAL EFFECTS, IF KNOWN

The scientific evidence of the pharmacological effects of 5-MeO-MIPT derive from the study of its neurochemical and central nervous system effects in animals and humans, as described below.

Neurochemical Effects

The neurochemical effects of 5-MeO-MIPT occur primarily through serotonergic systems in the brain. Hallucinogens are believed to produce their characteristic effects primarily through stimulation of serotonin (5-hydroxytryptamine; 5-HT) 5-HT2A receptors in the brain (Nichols, 2004). 5-MeO-MIPT binds to 5-HT2A receptors with an inhibitory constant (Ki) of approximately 42 nanomolar (nM) (Janowsky and Eshleman, 2006). Its Ki value is somewhat greater than that produced by LSD (0.8 nM), a 5-HT2 agonist and Schedule I hallucinogen. Functional assays evaluating one of the second messenger systems coupled to 5-HT2 receptors (arachidonic acid) show that 5-MeO-MIPT has high activity at the 5-HT2 site (Janowsky and Eshleman, 2006, Toll L. et al., 2006), with a half maximal effective concentration (EC50) value of 73 nM.

5-MeO-MIPT, like other tryptamine hallucinogens, has affinity for another serotonin receptor in the brain, the 5-HT1A receptor. 5-MeO-MIPT has been shown to bind at the 5-HT1A receptor with high affinity, with a half maximal inhibitotory concentration (IC50) value of 63 nM (Janowsky and Eshleman, 2007).

Thus, 5-MeO-MIPT has a complex pharmacology involving at least two serotonin receptors, one of which (the 5-HT2A receptor) is believed to be responsible for its hallucinogenic effects.

Central Nervous System Effects

The central nervous system effects of 5-MeO-MIPT have been evaluated in animal studies and through reported effects in humans. As described below, studies in animals and humans suggest that the pharmacological effects of 5-MeO-MIPT are similar to the Schedule I hallucinogens DMT and LSD.

Animal Studies

Animal studies conducted with 5-MeO-MIPT include those evaluating elicited behavioral pharmacology and drug discrimination.

Drug Discrimination

Drug discrimination is an experimental method used to determine whether an animal experiences the physiological or behavioral effects of a particular drug as similar to the physiological or behavioral effects of another drug (or class of drugs) to which the animal was previously exposed. In this test method, animals are trained to press one bar in the test cage following administration of a specific known drug of abuse and to press another bar following administration of placebo. A challenge session with the novel drug determines which of the two bars the animal presses more often, as an indicator of whether the test drug is more like the known drug of abuse or more like placebo. The novel drug is said to have "full generalization" to the known drug of abuse when the novel drug produces bar pressing greater than or equal to 80% on the bar associated with the known drug of abuse (Doat et al., 2003, Sannerud and Ator, 1995).

When rats are trained to recognize the effects of the Schedule I hallucinogen, DOM, in drug discrimination tests, they fully generalize to the presentation of 5-MeO-MIPT (Forster et al., 2007, Rutledge et al., 2007). 5-MeO-MIPT also partially shares discriminative stimulus effects with LSD, DMT, and MDMA (Gatch and Forster, 2006, 2007; Rutledge et al., 2007). These data indicate that 5-MeO-MIPT has stimulus properties that substantially overlap with those of other Schedule I hallucinogens: DOM, LSD, and MDMA.

Effects in Humans

Formal clinical studies with 5-MeO-MIPT found that an oral dose of 5 mg/kg produces a complete spectrum of psychotomimetic effects (Repke et al., 1985). Onset of action is 9 to 16 minutes and duration of effects lasts 3 to 3.2 hours. 5-MeO-MIPT produces general heightening of awareness accompanied by amphetamine-like stimulation.

Jacob and Shulgin (1984) compared the hallucinogenic potencies of a number of tryptamines and found that the effects of 5-MeO-MIPT in humans are 15-fold more potent than DMT.

5-MeO-MIPT has been described in a total of 34 self reports posted on the Internet (http://www.erowid.org/experiences/exp.cgi?S1=287). Information from this website indicates that the commonly used dosage range is 4 to 6 mg and 10 to 15 mg for oral and smoking routes of administration. Oral intake is reported to be the primary route of administration. Onset and duration of effects following oral 5-MeO-MIPT are reported to be 15 to 20 minutes and 4 to 7 hours, respectively. 5-MeO-MIPT reportedly causes a wide range of effects: euphoria, mood elevation, intensification of tactile sensations and smell, sexual interest, emotionally open, relaxation, powerful "rushing" sensation (smoked), immersive experience (smoked), feeling of body and muscle energy, buzzing, visual distortions, color intensification, sometimes dissociation, tremor, emotional lability, possible stomach discomfort, gas and vomiting, anxious stimulation, muscle tension/discomfort, and difficulty sleeping.

3. The State of Current Scientific Knowledge Regarding the Drug or Other Substance

Chemistry

5-MeO-MIPT (CAS number 96096-55-8) is a centrally-acting drug that is known chemically as N-isopropyl-5-methoxy- N-methyltryptamine. 5-MeO-MIPT free base has a molecular formula of $C_{15}H_{22}N_2O$ and a molecular weight of 282.8. It exists as a yellow or white crystalline powder. The melting point of the base is 162-163 degrees Centigrade. It is a synthetic chemical analogue of tryptamine and thus is structurally related to other tryptamines (natural and synthetic), such as 5-MeO-DMT (C-I), DMT (C-I), psilocybin (C-I), and serotonin.

Medical Use of 5-MeO-MIPT

5-MeO-MIPT is not an approved human drug product in the United States or in any other country and no data is available on its medical use in the treatment of any condition.

4. Its History and Current Pattern of Abuse

The history and current pattern of abuse of 5-MeO-MIPT is described in law enforcement reports and anecdotal reports by drug abusers.

5-MeO-MIPT is not an approved drug product in the United States. There appears to be no legitimate source for it.

DEA databases document law enforcement seizures of 5-MeO-MIPT as evidence that the substance has been available in the United States for abuse purposes since 2002. Additional information concerning 5-MeO-MIPT availability for abuse from DEA sources is described in Factor 5 (below).

As described in Factor 2 (above), anecdotal reports on the Internet indicate that some individuals are using 5-MeO-MIPT and report hallucinogenic effects (www.erowid.org).

5. The Scope, Duration and Significance of Abuse

Evidence from law enforcement databases and case reports regarding seizures provides evidence of the scope, duration, and significance of 5-MeO-MIPT abuse.

The DEA's System to Retrieve Information on Drug Evidence (STRIDE) database, which includes DEA drug seizure information, contains several records in which 5-MeO-MIPT was seized. In July 2004, law enforcement searched a company with suspected involvement of Internet distribution of controlled substances and seized 870.7 grams of powder 5-MeO-MIPT, which represents 174,140 doses for oral administration or 87,070 doses for smoking.

In January 2007, Federal law enforcement officials purchased undercover two items containing 5-MeO-MIPT from an individual involved in distributing a number of illicit drugs in Sandpoint, Idaho. These two items were liquid samples of 2.7 milliliters each contained in a dropper bottle labeled "spearmint ora labs ice drops 3.3 ml".

The DEA's National Forensic Laboratory Information System (NFLIS) reported one case in Wisconsin involving one 5-MeO-MIPT item.

In July 2004, a chemist from the Idaho State Police Laboratory informed DEA about law enforcement encounters of five capsules containing about 50 to 100 mg powder each. Chemical analysis confirmed the presence of 5-MeO-MIPT in capsules.

In August 2004, the Wisconsin State Forensic Laboratory identified 5-MeO-MIPT in combination with 5-MeO-DIPT in white powder seized by law enforcement.

Additionally, the Wisconsin State Crime Laboratory-Wausau reported seven tryptamine cases including 5-MeO-MIPT from 2002 to 2004.

These data demonstrate that 5-MeO-MIPT is available "on the street" as a drug of abuse.

6. WHAT, IF ANY, RISK THERE IS TO THE PUBLIC HEALTH

Public health risks resulting from abuse of 5-MeO-MIPT relate primarily to its ability to induce hallucinogenic effects and other sensory distortions, impaired judgment, and strange or dangerous behavior.

To date, there are two published case reports of serious adverse events in young people who used 5-MeO-MIPT. In one report, a 25-year-old man was found dead after consuming a combination alleged to be 5-MeO-MIPT, DMT, and various harmala extracts (Sklerov et al., 2005). It is unclear from the available information whether 5-MeO-MIPT played a direct role in the death. In the other report, an adolescent experienced a non-lethal severe poisoning after ingesting a combination alleged to be 5-MeO-MIPT and harmaline (Brush et al., 2004).

Additionally, there are 23 anecdotal case reports described on the Internet www.erowid.org in which individuals who purported to use 5-MeO-MIPT were treated by medical personnel. Adverse events observed in these individuals during emergency department visits include euphoria, mood elevation, intensification of tactile sensations and smell, sexual interest, emotionally open, relaxation, powerful "rushing" sensation (smoked), immersive experience (smoked), feeling of body and muscle energy, buzzing, visual distortions, color intensification, sometimes dissociation, tremor, emotional lability, possible stomach discomfort, gas and vomiting, anxious stimulation, muscle tension/discomfort, and difficulty sleeping.

7. ITS PSYCHIC OR PHYSIOLOGIC DEPENDENCE LIABILITY

The psychological or physiological dependence liability of 5-MeO-MIPT in animals or humans has not been reported in the scientific and medical literature. Thus, it is not possible at this time

to determine whether 5-MeO-MIPT produces physiological dependence following acute or chronic administration.

5-MeO-MIPT and related tryptamine hallucinogens (DOM, DMT, LSD, and mescaline, all of which are Schedule I drugs) have been shown to be highly abusable substances. Experimental data from drug discrimination studies in animals indicate that 5-MeO-MIPT fully generalizes to the discriminative stimulus effects of DOM (see Factor 2). Hallucinogens are not usually associated with physical dependence. However, hallucinogen abusers may develop psychological dependence, as evidenced by continued use despite knowledge of potential toxic and adverse effects of the substances.

8. WHETHER THE SUBSTANCE IS AN IMMEDIATE PRECURSOR OF A SUBSTANCE ALREADY CONTROLLED UNDER THE CSA

5-MeO-MIPT is not a known immediate precursor of any substance already controlled under the CSA.

C. Recommendation

After consideration of the eight factors determinative of control of a substance [21 U.S.C. § 811(c)], FDA recommends that N-isopropyl-5-methoxy-N-methyltryptamine (5-MeO-MIPT) and its salts be controlled in Schedule I.[2] 5-MeO-MIPT produces effects in humans similar to those of DOM, DMT, and LSD, all of which are controlled in Schedule I of the CSA.

The necessary criteria for placing a substance into Schedule I of the CSA are set forth in 21 U.S.C. § 812(b)(1), as follows:

(A) The drug or other substance has a high potential for abuse.

5-MeO-MIPT is a tryptamine chemical analogue and hallucinogen with a high potential for abuse that is similar to that of other hallucinogens: DMT, LSD, DOM, and mescaline, all of which are controlled in Schedule I. 5-MeO-MIPT elicits pharmacological effects qualitatively similar to these substances and is marked by hallucinations and CNS stimulation.

(B) The drug or other substance has no currently accepted medical use in treatment in the United States.

There are no approved NDAs for 5-MeO-MIPT in the United States. There is no known therapeutic application for 5-MeO-MIPT. Therefore, 5-MeO-MIPT has no currently accepted medical use in the United States.

---

[2] FDA notes that there are chemical substances that could potentially fall under the definition of positional isomer for 5-MEO-MIPT, set forth in the final rule published by DEA (72 FR 67850). Since these substances are different chemically from 5-MEO-MIPT, however, our scientific and medical evaluation and scheduling recommendation for 5-MEO-MIPT might not be applicable to those substances.

(C) There is a lack of accepted safety for use of the drug or other substance under medical supervision.

Since 5-MeO-MIPT has no approved medical use and has not been thoroughly investigated as a new drug, its safety under medical supervision has not been determined. Several reported emergency room admissions and one death related to abuse of 5-MeO-MIPT have been documented. Thus, there is a lack of accepted safety for use of this substance under medical supervision.

FDA therefore recommends that 5-MeO-MIPT and its salts be controlled in Schedule I of the CSA. NIDA concurs with this recommendation.

References

Doat MM, Rabin RA, Winter JC. Characterization of the discriminative stimulus properties of centrally administered (-)-DOM and LSD. Pharmacol Biochem Behav. 2003 Feb;74 (3):713-21.

Elsken, C and Forster, MJ (2006). Time-course (8-h) mouse locomotor activity test. Compound tested: 5-methoxy-N-isopropyl-N-methyltryptamine HCl. Report date: May 22, 2006, NIDA contract: to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Forster MJ, Gatch MB and Rutledge M (2007). Test of substitution for the discriminative stimulus effects of 2,5-dimethoxy-4-methylamphetamine with a 60-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: May 30, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Forster MJ, Gatch MB and Taylor CM (2006). Test of substitution for the discriminative stimulus effects of cocaine with a 60-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: December 20, 2006. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Forster MJ, Gatch MB and Taylor CM (2006). Test of substitution for the discriminative stimulus effects of cocaine with a 15-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: January 12, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Gatch MB and Forster MJ (2006). Test of substitution for the discriminative stimulus effects of (+)-methamphetamine. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: August 6, 2006. NIDA Contract to University of North texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Gatch MB and Forster MJ (2006). Test of substitution for the discriminative stimulus effects of (+)-methamphetamine with a 60 min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: August 6, 2006. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Gatch MB and Forster MJ (2006). Test of substitution for the discriminative stimulus effects of lysergic acid diethylamide with a 15 min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: August 15, 2006. NIDA Contract to University of North Texas Health Science Cetner at Fort Worth, TX (N01DA-2-8822).

Gatch MB and Forster MJ (2006). Test of substitution for the discriminative stimulus effects of lysergic acid diethylamide with a 60 min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: September 17, 2006. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Gatch MB and Forster MJ (2007). Test of substitution for the discriminative stimulus effects of dimethyltryptamine with a 15-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: April 20, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Gatch MB and Forster MJ (2007). Test of substitution for the discriminative stimulus effects of dimethyltryptamine with a 60-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date : May 4, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Jacob Pand ShuJgin AT (1984). Structure-Activity Relationships of the classic hallucinogens and their analogs. In hallucinogens an update. NIDA Research Monograph, 146, pp74-91.

Janowsky A and Eshleman A. In vitro receptor, transporter and release assays for NIDA medications discovery and abuse liability testing. Unpublished data generated for NIDA under contract Y1DA5007-03, 2006.

Janowsky A and Eshleman A (2007). Interaction with 5HT1a receptor: Inhibition of [3H]8-OH-DPAT binding Enhancement of [35S]GTPyS binding. Compound tested: 5-Methoxy-N isopropyl-N-methyltrypatmine. Report Date: October 25, 2007. Inter-Agency Agreement (No. Y1DA5007-04) to Research Service (R&D-22), Dept. of Veterans Affairs Medical Center, Portland, OR. IAG Title: "In vitro receptor, transporter, and release assays for NIDA medications discovery and abuse liability testing".

Janowsky A and Eshleman E (2006) A: Interaction with 5HT2a receptor: Inhibition of [125I]DOI binding, Enhancement of [3H]arachidonic acid release; B: Interaction with biogenic amine transporters: Inhibition of [125I]RTI-55 binding (DAT, SERT and NET), Inhibition of [3H]neurotransmitter uptake (DA, 5-HT and NE); C: Interaction with biogenic amine transporters: Enhancement of [3H]neurotransmetter release (DA, 5-HT and NE). Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine, Report date: May 23, 2006. Inter-Agency Agreement (No. Y1DA5007-03) to Research Service (R&D-22), Dept. of Veterans Affairs Medical Center, Portland, OR. IAG Title: "In vitro receptor, transporter, and release assays for NIDA medications discovery and abuse liability testing".

Nichols DE. Hallucinogens. Pharmacol Ther. 2004 Feb;101(2):131-81.

Repke DB, Grotjahn DB, Shulgin AT. Psychotomimetic N-methyl-N-isopropyltryptamines. Effects of variation of aromatic oxygen substituents. J Med Chem. 1985 Jul; 28(7): 892-6.

Rutledge M, Gatch MB and Forster MJ (2007). Test of substitution for the discriminative stimulus effects of 2,5-dimethoxy-4-methylamphetamine with a 15-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: March 1, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Rutledge M, Gatch MB and Forster MJ (2007). Test of substitution for the discriminative stimulus effects of 3,4-methylenedioxymethaphetamine with a 60 min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: May 08, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Rutledge M, Gatch MB and Forster MJ (2007). Test of substitution for the discriminative stimulus effects of 3,4-methylenedioxymethamphetamine with a 15 min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: February 22, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Rutledge M, Gatch MB and Forster MJ (2007). Test of substitution for the discriminative stimulus effects of 2,5-dimethoxy-4-methylamphetamine with a 60 min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: May 30, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Rutledge M, Gatch MB and Forster MJ (2007). Testing of substitution for the discriminative stimulus effects of 2,5-dimethoxy-4-methylamphetamine with a 15-min pretreatment time. Compound tested: 5-Methoxy-N-isopropyl-N-methyltryptamine. Report Date: July 9, 2007. NIDA Contract to University of North Texas Health Science Center at Fort Worth, TX (N01DA-2-8822).

Sannerud CA, Ator NA. Drug discrimination analysis of midazolam under a three-lever procedure: I. Dose-dependent differences in generalization and antagonism. J Pharmacol Exp Ther. 1995 Jan;272(1):100-11.

Shulgin A and Shulgin A. TIHKAL: Tryptamines I Have Known and Loved. Transform Press: Berkeley, California. 1997.

Skelerov J, Levine B, Moore KA, King T. and Fowler D (2005). A fatal intoxication following the ingestion of 5-Methoxy-N-isopropyl-N-methyltryptamine in an ayahuasca preparation. Journal of Analytical Toxicology, 29: 838-841

Toll L, Berzetei-Gurske I, Cunningham G, Jimenez L (2006). Receptor binding study report. Compound tested: 5-methoxy-N-isopropyl-N-methyltryptamine HCl. NIDA Contract to Biosciences division, SRI International, Menlo Park, CA (N01DA-1-8816). Contract title: "In Vitro Receptor Activity Determinations for Medications Development". SRI Project LSU-11501.