

and for its ability to produce euphoria with 2CB-like hallucinations. 2C-T-7 has not been approved for medical use in the United States by the FDA. The safety of this substance for use in humans has never been demonstrated.

Drug discrimination studies in animals have indicated that 2C-T-7 is a psychoactive substance capable of producing hallucinogenic-like discriminative stimulus effects (*i.e.*, subjective effects). 2C-T-7's subjective effects were shown to share some commonality with LSD; it partially substituted for LSD up to doses that severely disrupted performance in rats trained to discriminate LSD (Committee on Problems on Drug Dependence, Drug Evaluation Committee, Personal Communication). Like 2CB, DOM, and DOB, 2C-T-7 displays affinity for central serotonin receptors. Radioligand binding assays showed that 2C-T-7 affinity for the 5-HT receptor system was selective. Self-reports indicate that the hallucinogenic effects of 2C-T-7 are comparable to those of 2CB and mescaline.

#### *Why is 2C-T-7 Being Controlled?*

The abuse of stimulant/hallucinogenic substances in popular all night dance parties (raves) and in other venues has been a major problem in Europe since the 1990s. In the past several years, this activity has spread to the United States. The Schedule I controlled substance MDMA and its analogues, collectively known as Ecstasy, are the most popular drugs abused at these raves. Their abuse has been associated with both acute and long-term public health and safety problems. These raves have also become venues for the trafficking and abuse of other controlled substances. 2C-T-7 made its appearance in the "rave" scene in Wisconsin, Oakland, California, and the Atlanta, Georgia areas.

The abuse of 2C-T-7 by young adults in the United States began to spread in the year 2000. Since that time, 2C-T-7 has been encountered by law enforcement agencies in Northern Wisconsin, Texas, Tennessee, Washington, Oklahoma, Atlanta, Georgia, and the San Francisco, California areas. DEA information shows that 2C-T-7 has been observed at local "rave" parties in California and part of the Southeastern United States.

Information gathered by DEA also indicates that 2C-T-7 has been purchased in powder form over the Internet and distributed as such. In the United States, capsules containing 2C-T-7 powder also have been encountered.

An Internet company was identified as a source of 2C-T-7 being sold in the

United States. The business was operated from the owner's residence. Law enforcement authorities in Tennessee made a controlled purchase of 2C-T-7 from this Internet company; 250 mg of 2C-T-7 was purchased for \$150.00. The owner has been charged with the distribution of 2C-T-7 and other products. 2C-T-7 has been clandestinely produced in the United States. A clandestine laboratory, identified as the supplier of 2C-T-7 to this Internet company, was seized in 2002 by DEA in Las Vegas, Nevada. 2C-T-7 has been sold as "Tweety-Bird Mescaline." It has also been found in combination with N,N-dipropyltryptamine (DPT).

Sensory distortion and impaired judgment can lead to serious consequences for both the user and the general public. 2C-T-7 can have lethal effects when abused alone or in combination with other illicit drugs. To date, three deaths have been associated with the abuse of 2C-T-7. The first death occurred in Oklahoma during April of 2000; a young healthy male overdosed on 2C-T-7 following intranasal administration. The co-abuse of 2C-T-7 with MDMA will pose a significant health risk if 2C-T-7's popularity increases in the same venues as with MDMA. The co-abuse of 2C-T-7 with MDMA has resulted in lethal effects. The other two 2C-T-7 related deaths occurred in April 2001 and resulted from the co-abuse of 2C-T-7 with MDMA. One young man died in Tennessee while another man died in the state of Washington.

#### **N-Benzylpiperazine and 1-(3-trifluoromethylphenyl)piperazine**

##### *What are N-Benzylpiperazine and 1-(3-trifluoromethylphenyl)piperazine?*

N-Benzylpiperazine (BZP) and 1-(3-trifluoromethylphenyl)piperazine (TFMPP) are piperazine derivatives. BZP was first synthesized as a potential antiparasitic agent. It was subsequently shown to possess amphetamine-like and some antidepressant activity, but was not developed for marketing. TFMPP is an industrial chemical and shares some pharmacological similarities with 3,4-methylenedioxymethamphetamine (MDMA or Ecstasy). Both BZP and TFMPP are primarily used as chemical intermediates and have no accepted medical use in the United States. The safety of these piperazines for use in humans has never been demonstrated.

The available evidence suggests that the pharmacological effects of BZP and TFMPP are substantially similar to amphetamine and MDMA, respectively. The abuse liability studies conducted by

the Drug Evaluation Committee of the College on Problems of Drug Dependence indicate that rhesus monkeys consistently self-administer BZP and exhibit stimulant-like behavioral effects following BZP self-administration sessions. BZP fully generalizes to amphetamine's discriminative stimulus in monkeys. TFMPP generalizes to MDMA's discriminative stimulus effects and serves as discriminative stimulus in rats. Serotonergic mechanisms mainly underlie the discriminative stimulus effects of TFMPP.

Consistent with the above-mentioned animal studies, it has been shown that BZP is about 20 times more potent than amphetamine in producing stimulant-like subjective and cardiovascular effects in humans (Bye C, *et al.*, Eur. J. Clin. Pharmacol. 6: 163-169, 1973). Similarly, Campbell and colleagues (Eur. J. Clin. Pharmacol. 6: 170-176, 1973), using a double-blind clinical study involving 18 subjects with a history of amphetamine dependence, reported that the nature and the time-course of behavioral, autonomic and subjective effects following BZP administration are similar to those of amphetamine. BZP was found to be about 10 times more potent than amphetamine in this study.

Self-reports suggest that the subjective effects of BZP are stimulant-like and TFMPP is an active hallucinogen. These reports collectively suggest that BZP has amphetamine-like subjective and reinforcing effects, while TFMPP might have MDMA-like subjective effects in humans. Similar to other classical hallucinogens, TFMPP also binds to serotonin receptors. TFMPP, similar to MDMA, has been shown to release 5-HT from central serotonergic neurons through uptake carrier-dependent mechanism (Pettibone D and Williams M, Biochem. Pharmacol. 33: 1531-1535, 1984; Auerbach SB, *et al.*, Neuropharmacol. 30: 307-311, 1991).

##### *Why are BZP and TFMPP Being Controlled?*

The initial indication of the abuse of BZP and TFMPP appeared in late 1996. An individual in Santa Barbara, California, promoted the use and sale of these and other ring-substituted phenylpiperazines homologs (*i.e.*, 3-chlorophenyl-piperazine and 4-methoxyphenylpiperazine) through the Internet.

The abuse of BZP/TFMPP has been growing as evidenced by the increasing encounters by law enforcement agencies since the late 1990's. BZP powder, or tablets containing BZP alone or in combination with TFMPP, have been