DEA TOX

DRUG ENFORCEMENT ADMINISTRATION

TOXICOLOGY TESTING PROGRAM

QUARTERLY REPORT

Second Quarter – 2023

U.S. Department of Justice
Drug Enforcement Administration
Diversion Control Division
Drug and Chemical Evaluation Section

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Introduction

The Drug Enforcement Administration's Toxicology Testing Program (DEA TOX) began in May 2019 as a surveillance program aimed at detecting new psychoactive substances within the United States. In response to the ongoing synthetic drug epidemic, the Drug Enforcement Administration (DEA) awarded a contract with the University of California at San Francisco (UCSF) to analyze biological samples generated from overdose victims of synthetic drugs.

In many cases, it can be difficult to ascertain the specific substance responsible for the overdose. The goal of DEA TOX is to connect symptom causation to the abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, synthetic opioids, other hallucinogens, etc.).

DEA has reached out to local health departments, law enforcement partners, poison centers, drug court laboratories, hospitals, and other medical facilities to offer testing of leftover or previously collected samples for analysis of synthetic drugs. DEA TOX is interested in patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted). DEA TOX may approve testing of unused biological samples or on occasion non-biological samples from a medical facility or law enforcement partner only.

Requests for testing may be submitted directly to DEA TOX (**DEATOX@DEA.GOV**). Upon explicit approval of the request for testing of specific samples, the originating laboratory is invited to send their samples to the Clinical Toxicology and Environmental Biomonitoring (CTEB) Laboratory at UCSF. DEA covers the full cost of analysis for each sample approved for testing. Using liquid chromatography quadrupole time-of-flight mass spectrometry, synthetic drugs identified within the samples are confirmed and quantified.

The CTEB laboratory currently maintains a comprehensive drug library consisting of 1218 drugs, of which 962 are new psychoactive substances.

This publication presents the results of cases analyzed and completed by the CTEB laboratory from April 1, 2023, through June 30, 2023. Confirmed levels denoted in the tables below with a defined range represent the low and high concentrations reported when the frequency of detection is greater than one.

Summary

Between April 1, 2023 and June 30, 2023, 192 biological samples from 168 cases originating from 13 states namely, Florida (14), Illinois (13), Kansas (6), Kentucky (61), Louisiana (7), Maryland (20), Nebraska (17), North Carolina (4), Ohio (16), Tennessee (26), Texas (5), Utah (1), and Washington (2) were analyzed by DEA TOX. These samples were analyzed for NPS, TID, prescription or OTC drugs, DSS, and P/A/I. The biological samples submitted consisted of 17 serum, 31 plasma, 123 whole blood, 20 urine, and 1 tissue sample. Two drug product samples were also analyzed this quarter, both originating from Louisiana.

DEA TOX identified and confirmed a total of 1,091 drugs and metabolites that consisted of 110 NPS detections, 409 TID detections, 438 prescription or OTC drug detections, 1 DSS, and 133 P/A/I detections during this reporting period (Fig. 1A). While some drugs identified could be placed in more than one category, for purposes of this report and for consistency, DEA TOX placed such substances in a single category only. Many prescription drugs that are commonly abused and encountered are listed as TID. Substances that are not approved by the Food and Drug Administration for medical use within the U.S. are considered NPS.

A breakdown of the 1,091 total drug and metabolite confirmations demonstrated 108 different drugs, which consisted of 18 NPS, 15 TID, 69 prescription or OTC drugs, 1 DSS, and 5 P/A/I (Fig. 1B).

Of the cases submitted this quarter, 71 out of the 182 cases (39.0%) detected at least one NPS. In addition, 93 out of the 182 cases (51.1%) contained fentanyl.

Fig. 1A Detection frequency

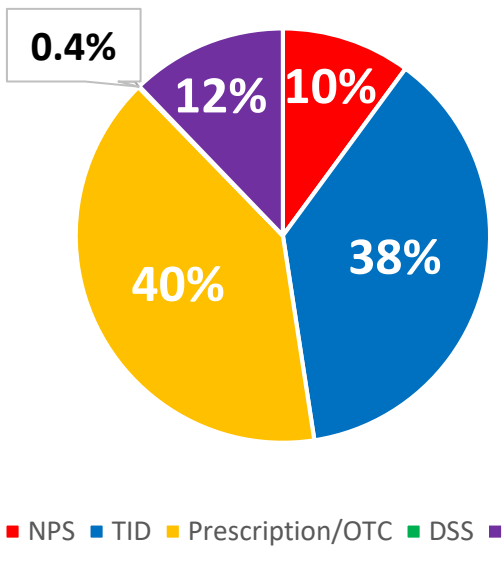
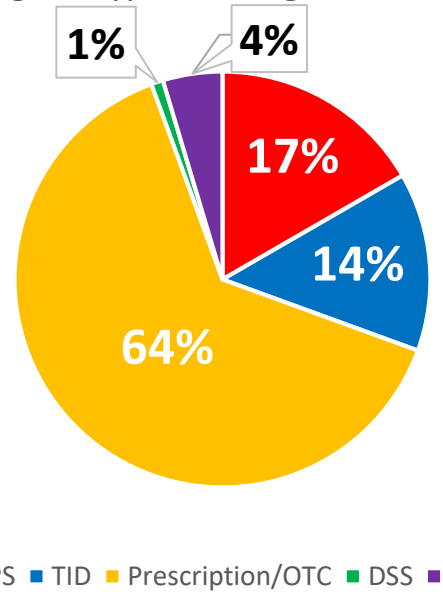


Fig. 1B Types of Drugs Detected



New Psychoactive Substances

DEA TOX confirmed 110 detections comprising of 18 NPS[§] (Table 1) from four different classes of drugs (Figure 2A) in biological samples in the second quarter of 2023. The total encounters for each NPS class are summarized in Figure 2B.

Figure 2A. Number of Substances Identified for Each NPS Class

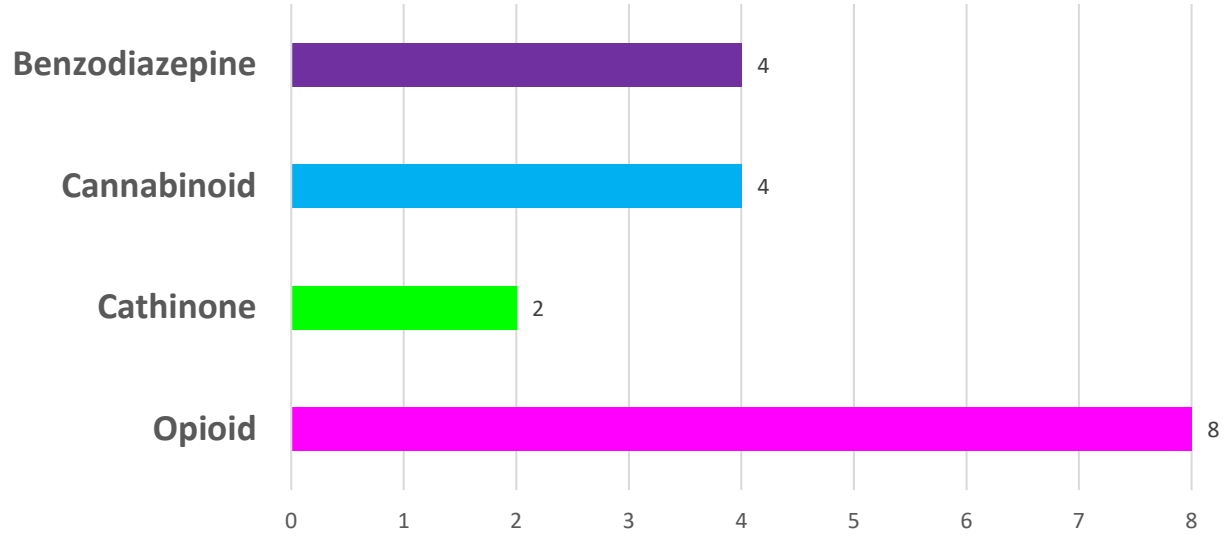


Figure 2B. Total Encounters for Each NPS Class

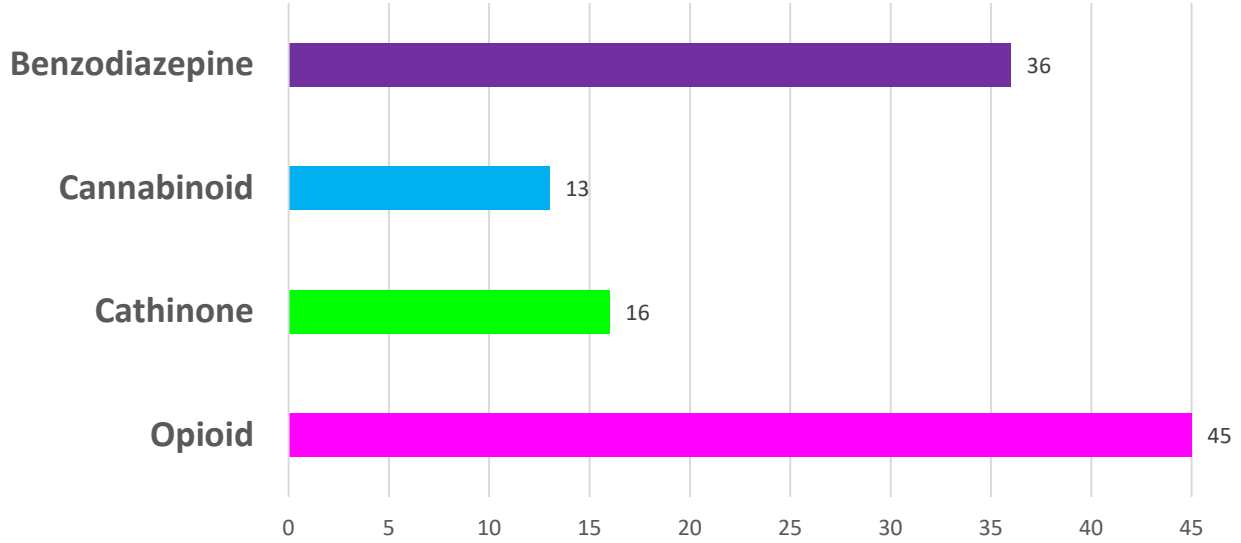


Table 1. NPS detected in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Benzodiazepine (4)	8-Amino Clonazolam	5	IL, TN (4)	0.1		3.6-33.2	
	Bromazolam	28	FL, IL, KY (9), MD (2), OH (3), TN (11), WA	96.0	0.5-37.6	0.2-309	7.8-224
	Flualprazolam	2	TN (2)			0.7-10.3	
	Flubromazepam	1	TN			1.5	
Cannabinoid (4)	11-nor-9-carboxy-delta-8-THC	6	KY (5), TX	252-364	39.3-651		81.4-306
	ADB-BUTINACA	3	KY (3)			3.4-9.4	
	ADB-INACA	2	KY (2)			8.6-40.6	
	MDMB-4en-PINACA	1	KY			0.5	
	MDMB-4en-PINACA Acid Metabolite	1	KY			36.7	
Cathinone (2)	*N*,*N*-Dimethylpentylone	8	FL (6), KY, TN			0.3-3850	
	Pentylone	8	FL (6), KY, TN			0.3-1710	

Table 1 (Continued). NPS in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Opioid (8)	7-OH Mitragynine	5	LA, NE, TN (3)			0.8-25.1	
	Acetyl Fentanyl	4	MD, OH, TN (2)	3.4		1.4-5.4	
	Brorphine	3	TN (3)			0.1-2.3	
	Despropionyl *para*-fluorofentanyl	2	TN (2)			0.5-7.6	
	Metonitazene	7	IL, OH, TN (5)	3.8	10.4	1.5-28.5	
	Mitragynine	9	KY (2), LA, NE (3),TN (3)			1.0-4050	
	N-Desethyl Isotonitazene	3	TN (2), UT			1.4-8.9	
	para-Fluorofentanyl	10	IL, KY, LA, MD, TN (6)			0.2-31.0	952
	Protonitazene	1	TN			1.4	
	Tianeptine	1	TN			3.0	

* FL – Florida; IL – Illinois; KY – Kentucky; LA – Louisiana; MD – Maryland; NE – Nebraska; OH – Ohio; TN – Tennessee; TX – Texas; UT – Utah; WA – Washington

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Traditional Illicit Drugs

DEA TOX confirmed 409 detections of 15 TIDs[§] (Table 2) in biological samples in the second quarter of 2023. An additional TID detection from a drug product is described in Table 6.

Table 2. TID Detected in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Amphetamine (2)	4-OH Methamphetamine	1	NE			11.8	
	Amphetamine	17	KY (5), LA, MD (2), NE (3), TN (6)		27.0-35.2	6.4-237	279
	Methamphetamine	51	FL (2), IL, KY (17), LA, MD (3), NE (7), OH (2), TN (17), UT (1)	9.2-420	3.1-575	1.6-9260	1740-5340
Arylcyclo-hexylamine (1)	Ketamine	11	IL (3), KS, KY (4), OH, TN (2)	835	298	225-5300	980-8600
Cannabinoid (1)	11-nor-9-carboxy-delta-9-THC	9	FL, IL, KY (5), OH, TX	373	60	28.6-1080	62.4-724
Cocaine (1)	Benzoylecgonine	46	FL (3), IL (4), KY (9), LA (2), MD (10), NC (2), NE (2), OH (7), TN (7)	5.8-237	49.6-2500	0.4-7340	7.2-383000
	Cocaethylene	3	KY, TN (2)	NQ	NQ	NQ	NQ
	Cocaine	24	FL (3), IL (2), KY (4), LA, MD (5), NC, OH (2), TN (6)	36.9		0.3-414	6.1-61200
	Ecgonine Methyl Ester	24	FL (2), IL (3), KY (6), MD (5), NC, OH (5), TN (2)	NQ	NQ	NQ	NQ
Lysergamide (1)	LSD	2	KY (2)		0.2	1	

Table 2 (Continued). TID in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Opioids (9)	6-Acetyl Morphine	1	TN			13.4	
	Beta-hydroxy Fentanyl	13	KY (5), MD, OH (2), TN (4), TX	7.7	2.2-5	0.8-87.7	24-1210
	Codeine	6	FL, KY (3), TN (2)			0.5-11.2	
	Desmethyl-cis-tramadol	4	KY (2), MD, NC			12.7-42.6	1.6
	Fentanyl	94	FL (4), IL (10), KS, KY (21), LA (2), MD (15), NC, NE (12), OH (7), TN (17), TX (2), WA (2)	0.4-50.7	0.1-25	0.4-812	12.2-7740
	Hydrocodone	3	FL, LA (2)			1.5-47.9	
	Hydromorphone	3	KY (2), TN	70	19.3	16.8	
	Morphine	9	FL, KY (2), NC, TN (5)			2-499	
	Norfentanyl	71	FL (4), IL (7), KS, KY (14), MD (10), NC, NE (9), OH (7), TN(14), TX (2), WA (2)	0.4-9.4	0.2-15.4	0.2-2000	9-70600
	Oxycodone	9	FL (2), KY (3), MD, NE, OH, TN	6.3	8	2.7-84.1	
	Tramadol	7	KY (2), MD (3), NC, OH	1.1		0.9-107	3.1

* FL – Florida; IL – Illinois; KS – Kansas; KY – Kentucky; LA – Louisiana; MD – Maryland; NC – North Carolina; NE – Nebraska; OH – Ohio; TN – Tennessee; TX – Texas; UT – Utah; WA – Washington

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine; NQ – not quantified

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections

Prescription and Over the Counter Drugs

DEA TOX confirmed 436 detections of 60 prescription or OTC drugs§ (Table 3) in the second quarter of 2023. Drugs for the prescription/OTC drugs panel are not typically quantitated unless specifically requested thus "Confirmed Levels" are not provided. An additional detection from a drug product is described in Table 6.

Table 3. Prescription or OTC drugs detected in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*
Anesthetic (3)	Bupivacaine	1	OH
	Lidocaine	16	IL, KY (3), MD, OH (4), TN (6), TX
	Medetomidine	1	KS
Antibiotic (1)	Sulfomethoxazole	1	OH
Anticoagulant (1)	Warfarin	1	KY
Anticonvulsant (5)	Gabapentin	28	FL (3), IL (2), KY (6), LA (5), MD (2), NE (3), OH (3), TN (4)
	Lamotrigine	5	FL, IL, KY, OH, TN
	Levetiracetam	3	KY (2), TX
	Topiramate	3	KY, OH (2)
Antidepressant (11)	Amitriptyline	3	KY (2), WA
	Bupropion	2	KS, TN
	Citalopram	8	FL, KY, LA, MD (3), NE, TX
	Doxepin	3	KY, LA, TN
	Duloxetine	4	KY, LA, NC, OH
	Fluoxetine	6	IL, KY (2), NE (2), UT
	mCPP**	13	FL, IL, KY (4), LA (3), MD, NE, OH (2)
	Mirtazapine	4	LA, TN (3)
	Nordoxepin**	3	KY, LA, TN
	Norfluoxetine**	6	YL, KY (2), NE (2), UT
	Nortriptyline**	2	MD, WA
	Protriptyline	2	KY (2)
	Sertraline	7	IL, KY, LA, MD (2), OH, TN
	Trazodone	12	KY (4), LA (3), MD, NE, OH (3)
	Venlafaxine	4	KY, TN (3)
Antidiabetic(1)	Metformin	1	IL

**Compounds are expected metabolites of parent drugs, as follow:

Expected Metabolite	Parent Drug
mCPP	Trazodone
Nordoxepin	Doxepin

Expected Metabolite	Parent Drug
Norfluoxetine	Fluoxetine
Nortriptyline	Amitriptyline

Table 3 (Continued). Prescription or OTC drugs in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*
Antihistamine (5)	Chlorpheniramine	2	NE, TN
	Diphenhydramine	43	FL, IL (6), KS, KY (13), LA (2), MD (2), NE (3), OH (5), TN (10).
	Doxylamine	5	IL, LA, TN (3)
	Hydroxyzine	13	FL, IL, KY (2), NC, NE, OH (3), TN (2), TX (2)
	Promethazine	1	LA
Antipsychotic (3)	Aripiprazole	3	KY (2), LA
	Olanzapine	7	FL, KS, KY, MD, OH, TX (2)
	Quetiapine	6	IL (2), KY (2), MD, NC
Antiretroviral (2)	Emtricitabine	2	IL, KY
	Tenofovir	1	IL
Anxiolytic (1)	Buspirone	1	LA
Barbiturate (1)	Butalbital	1	KY
Benzodiazepine (5)	7-amino Clonazepam**	10	FL, KY, MD (4), TN (2), TX (2)
	Alpha-hydroxy Alprazolam**	6	FL, NE (3), TX (2)
	Alprazolam	16	FL, IL, KY, MD (4), NE (5), TN (2), TX (2)
	Desalkylflurazepam**	1	IL
	Diazepam	8	KY (4), MD, OH, TN (2)
	Lorazepam	7	IL (2), KS (2), KY, LA, TN
	Midazolam	11	IL, KS, KY (8), TN
	Nordiazepam**	11	KY (5), MD, NE, OH (2), TN (2)
	Oxazepam**	4	KY (3), TN
	Temazepam**	3	KY (2), TN
Cardiovascular (9)	Amiodarone	2	TN (2)
	Atenolol	1	MD
	Atorvastatin	4	FL, IL, KY, LA
	Atropine	1	TN
	Clonidine	3	KY, LA, TN
	Labetalol	1	NC
	Lisinopril	5	IL, KS, KY (2), MD
	Metoprolol	7	IL, KY (3), LA (2), OH
	Propanolol	1	KY

**Compounds are expected metabolites of parent drugs, as follow:

Expected Metabolite	Parent Drug
7-Amino Clonazepam	Clonazepam
Alpha-Hydroxy Alprazolam	Alprazolam
Desalkylflurazepam	Midazolam

Expected Metabolite	Parent Drug
Nordiazepam	Diazepam
Oxazepam	Diazepam
Temazepam	Diazepam

Table 3 (Continued). Prescription or OTC drugs in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*
Cough Suppressant (2)	Dextromethorphan	6	KY, NC, NE, OH, TN (2)
	Dextrorphan	5	KY, NC, NE, OH, TN
Diuretic (1)	Furosemide	1	KY
Muscle Relaxant (3)	Baclofen	2	KY, TN
	Cyclobenzaprine	6	IL, KY, LA, MD, NE, TN
	Methocarbamol	2	NE, OH
Opioid (3)	Buprenorphine	6	IL, KY (3), OH, TN
	EDDP**	9	KY (3), MD, OH (3), TN (2)
	Methadone	11	KY (4), MD (2), OH (3), TN (2)
	Naloxone	46	FL (2), IL (6), KY (14), LA, MD (5), NC (2), NE (4), OH (2), TN (8), TX, WA
	Norbuprenorphine**	4	KY (2), OH, TN
Pain Reliever (3)	Acetaminophen	10	IL, KY (6), NC, OH (2)
	Indomethacin	1	NE
	Naproxen	1	KY

* FL – Florida; IL – Illinois; KS – Kansas; KY – Kentucky; LA – Louisiana; MD – Maryland; NC – North Carolina; NE – Nebraska; OH – Ohio; TN – Tennessee; TX – Texas; UT – Utah; WA – Washington

**Compounds are expected metabolites of parent drugs, as follow:

Expected Metabolite	Parent Drug
EDDP	Methadone

Expected Metabolite	Parent Drug
Norbuprenorphine	Buprenorphine

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Dietary Supplement Stimulants

DEA TOX confirmed 1 detection of a DSS (Table 4) in a biological sample in the second quarter of 2023.

Table 4. DSS Detected in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*
Hormone	Melatonin	1	LA

*LA – Louisiana

Precursors/Additives/Impurities

DEA TOX confirmed 133 detections of 6 P/A/I§ (Table 5) in biological samples in the second quarter of 2023.

Table 5. P/A/I Detected in Biological Samples – Second Quarter 2023

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Adulterant (3)	Quinine	52	IL (5), KY (12), MD (15), NE, OH (4), TN (15)	5-305	2.5-39.5	0.2-1810	59.8-1970
	Phenacetin	2	TN (2)			2.9-3.7	
	Xylazine	29	FL, IL (2), KY (4), LA, MD (3), OH (3), TN (15)	4.1-14.4	7.4-12.5	0.1-337	11.6-329
Impurity (1)	*N*,*N*-dimethyl amphetamine	6	KY, NE (3), TN (2)			2.1-34.2	
Precursor (2)	4-Anilino Piperidine	1	TN			41.5	
	4-ANPP	43	FL (4), IL (1), KY (6), MD (10), NC, NE (6), OH, TN (11), TX (2), WA			0.1-552	11-287

*FL – Florida; IL – Illinois; KY – Kentucky; LA – Louisiana; MD – Maryland; NC – North Carolina; NE – Nebraska; OH – Ohio; TN – Tennessee; TX – Texas; WA – Washington

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Drug Products

DEA TOX confirmed 2 detections of 2 drugs (Table 6) in 2 drug product samples analyzed in the second quarter of 2023.

Table 6. Drugs Detected in Drug Products – Second Quarter 2023

Drug Class	Drug Subclass	Drug	Freq.	States Found*	Level (µg)
Traditional Illicit Drugs	Opioid	Fentanyl	1	LA	12.7
Prescription Drugs	Anticonvulsant	Gabapentin	1	LA	0.373

*LA – Louisiana

Select Drug Product Exhibits:

Table 7. Drug Product Exhibit #1: Total Exhibit Weight: 1.8720g

Drug Class	Drug	State Found*	Confirmed Levels: µg of drug/gram of drug product	Actual Amount within Drug Product
Opioid	Fentanyl	LA	6.8 µg/g	12.7 µg

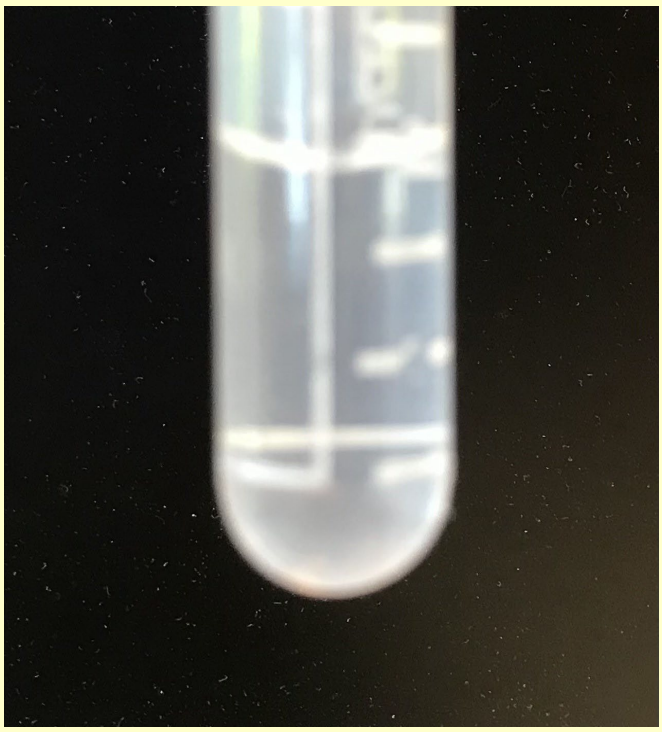

Table 8. Drug Product Exhibit #2: Total Exhibit Weight: 2.1412g

Drug Class	Drug	State Found*	Confirmed Levels: ng of drug/gram of drug product	Actual Amount within Drug Product
Anticonvulsant	Gabapentin	LA	174 ng/g	373 ng

Contact Information

We invite medical and law enforcement facilities to contact our program if you encounter an overdose of a suspected synthetic drug and desire to have any leftover biological samples (blood preferred) analyzed further for such synthetic substances.

- **Sample Qualifications:**
  - Patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted).

- **How to Contact Us and Send Your Samples:**
  - Once the above qualifications are satisfied:
    - Email **DEATOX@DEA.GOV** with a brief description of the case (including initial toxicology screen and history) and a request for testing.
    - DEA will respond to each inquiry, and if approved, will send the instructions for packing and shipping of sample(s) to UCSF.
      - This program's goal is to connect symptom causation to abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, fentanyl-related substances, other hallucinogens etc.).
  - Ensure that you de-identify and label the sample with a numerical value, sex, date of birth or age, and the date and time the sample was collected in accordance with the labeling instructions (sent with shipping instructions).
  - Keep a master list of the patients and the numerical values you allocated to each sample at your institution.

- **Cost of Sample Analysis:**
  - DEA will cover the full cost of testing the patient samples.
    - The sender will only be responsible for paying for packing and shipping samples to UCSF.

- **Turn-around Time:**
  - Results are expected within three to four weeks of receipt of the sample at UCSF except in rare occurrences when a novel substance is identified.

Public Domain Notice

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