DEA TOX

DRUG ENFORCEMENT ADMINISTRATION

TOXICOLOGY TESTING PROGRAM

QUARTERLY REPORT

2025 Second Quarter

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

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Lists of Acronyms

Institutions and Programs

Acronym	Definition
CTEB	Clinical Toxicology and Environmental Biomonitoring
DEA	Drug Enforcement Administration
DEA TOX	Drug Enforcement Administration Toxicology Testing Program
UCSF	University of California, San Francisco

Drug Categories

Acronym	Definition
DSS	Dietary supplement stimulants
NPS	Novel psychoactive substances
OTC	Over-the-counter
P/A/I	Precursors, additives, or impurities
PD	Prescription drugs
TRD	Traditional recreational drugs

Sample-Related / Specimen Types

Acronym	Definition
NQ	Not quantified
P	Plasma
S	Serum
U	Urine
WB	Whole blood

Units of Measurement

Acronym	Definition
g	Gram
mg	Milligram (1/1000th of a gram)
µg	Microgram (1/1000th of a milligram)
ng	Nanogram (1/1000th of a microgram)
mL	Milliliter

Localities Relevant to This Quarter

Acronym	Definition
U.S.	United States
CA	California
FL	Florida
IL	Illinois
KS	Kansas
KY	Kentucky
LA	Louisiana
MD	Maryland
MO	Missouri
NE	Nebraska
NM	New Mexico
TN	Tennessee
TX	Texas
UT	Utah
WA	Washington

Common Substance Acronyms

Acronym	Definition
4-ANPP	4-Anilino-*N*-phenethylpiperidine
EDDP	2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine
*m*CPP	*meta*-Chlorophenylpiperazine
MDMA	3,4-Methylenedioxymethamphetamine
MDDMA	3,4-Methylenedioxy-*N*,*N*-dimethylamphetamine
THC	Tetrahydrocannabinol

Introduction

The Drug Enforcement Administration Toxicology Testing Program (DEA TOX) began in May 2019 as a surveillance program aimed at detecting novel psychoactive substances (NPS) within the United States. In response to the ongoing synthetic drug epidemic, the Drug Enforcement Administration (DEA) awarded a contract to the Clinical Toxicology and Environmental Biomonitoring (CTEB) Laboratory at the University of California, San Francisco (UCSF) to analyze biological samples—originating from drug related overdoses involving synthetic drugs—that DEA approves for submission by various stakeholders.

In many cases, the specific substance responsible for an overdose can be difficult to ascertain. 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).

DEA TOX is interested in samples from patients thought to have ingested a synthetic drug, for which a drug screen 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 biological samples (blood preferred) from medical facilities, health departments, poison centers, law enforcement, or related institutions. On occasion, DEA TOX may approve non-biological samples. DEA TOX does not accept personal samples.

DEA covers the cost of analysis for each sample approved for testing. Requests for testing must 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 CTEB Laboratory at UCSF. The CTEB Laboratory uses liquid chromatography quadrupole time-of-flight mass spectrometry to confirm and quantify synthetic drugs identified within the samples. The CTEB Laboratory currently maintains a comprehensive drug library consisting of 1,361 drugs, of which 1,074 are NPS.

This publication presents the results of cases received and analyzed by the CTEB Laboratory during the second quarter [April 1–June 30] of 2025 (2025 Q2). These results are presented in tables throughout this document. If the frequency of detection for a substance is greater than one, the detected levels of that substance are denoted as a defined range that represents the low and high concentrations reported for that substance.

Summary

During 2025 Q2, DEA TOX received 112 samples from 86 cases originating from 14 states: California [5], Florida [9], Illinois [1], Kansas [2] Kentucky [9], Louisiana [2], Maryland [13], Missouri [1], Nebraska [7], New Mexico [2], Tennessee [11], Texas [3], Utah [1], and Washington [19]. These samples included 85 biological samples [21 serum, 7 plasma, 49 whole blood, 6 urine, 1 decomposition fluid, and 1 liver tissue] and 27 drug products. Of these cases, 5 cases had multiple biological samples analyzed and 2 cases had multiple drug products tested.

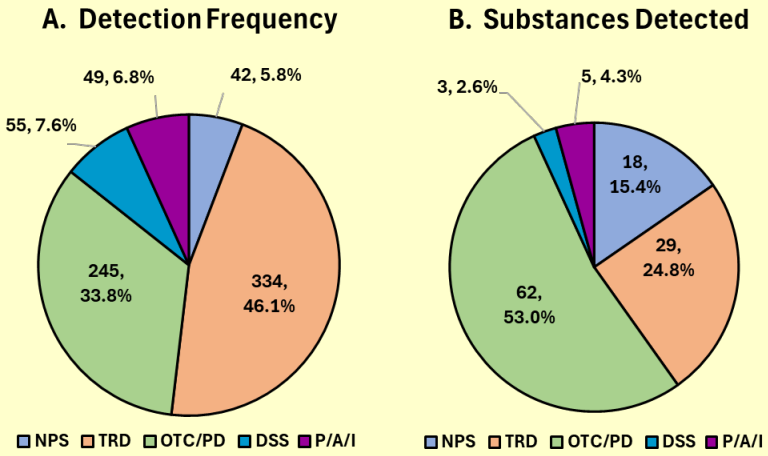
DEA TOX analyzed these samples for NPS; traditional recreational drugs (TRD); over-the-counter (OTC) or prescription drugs (PD); dietary supplement stimulants (DSS); and precursors, additives, or impurities (P/A/I). DEA TOX did not detect analytes in three of these samples.

During 2025 Q2, DEA TOX reported a total of 725 detections across biological and drug product samples (Figure 1A), spanning 117 distinct analytes (Figure 1B). While some identified drugs could be placed in multiple categories, for purposes of this report and for consistency, DEA TOX placed such substances in a single category only. Consequently, many PD that are commonly abused and encountered are listed as TRD. Substances that are not approved by the Food and Drug Administration for medical use within the United States are considered NPS.

Of the cases submitted this quarter, 24 (27.9%) of the 86 cases involved at least one NPS analyte. In addition, 41 (47.7%) of the 86 cases involved the detection of fentanyl.

In this report, the frequency refers to the number of cases in which an analyte was identified and includes the number of fatal cases in square brackets. For example, a frequency denoted as "12 [5]" refers to 12 total cases, of which 5 were fatal. In addition, the number of cases originating from the participating states are indicated in parenthesis following the state abbreviation. For example, an annotation of "CA(2)" indicates that 2 of the relevant cases originated from California.

Figure 1. Substance Detections By Drug Category.



Novel Psychoactive Substances

DEA TOX confirmed 42 total detections comprised of 18 NPS analytes across all 2025 Q2 samples. In biological samples, 24 cases were analyzed, resulting in 33 detections (Figure 2A and Table 1) that consisted of 17 NPS analytes (Figure 2B) from 5 different drug classes. NPS detections in drug products are described in Table 6.

Figure 2. NPS Substance Detections.

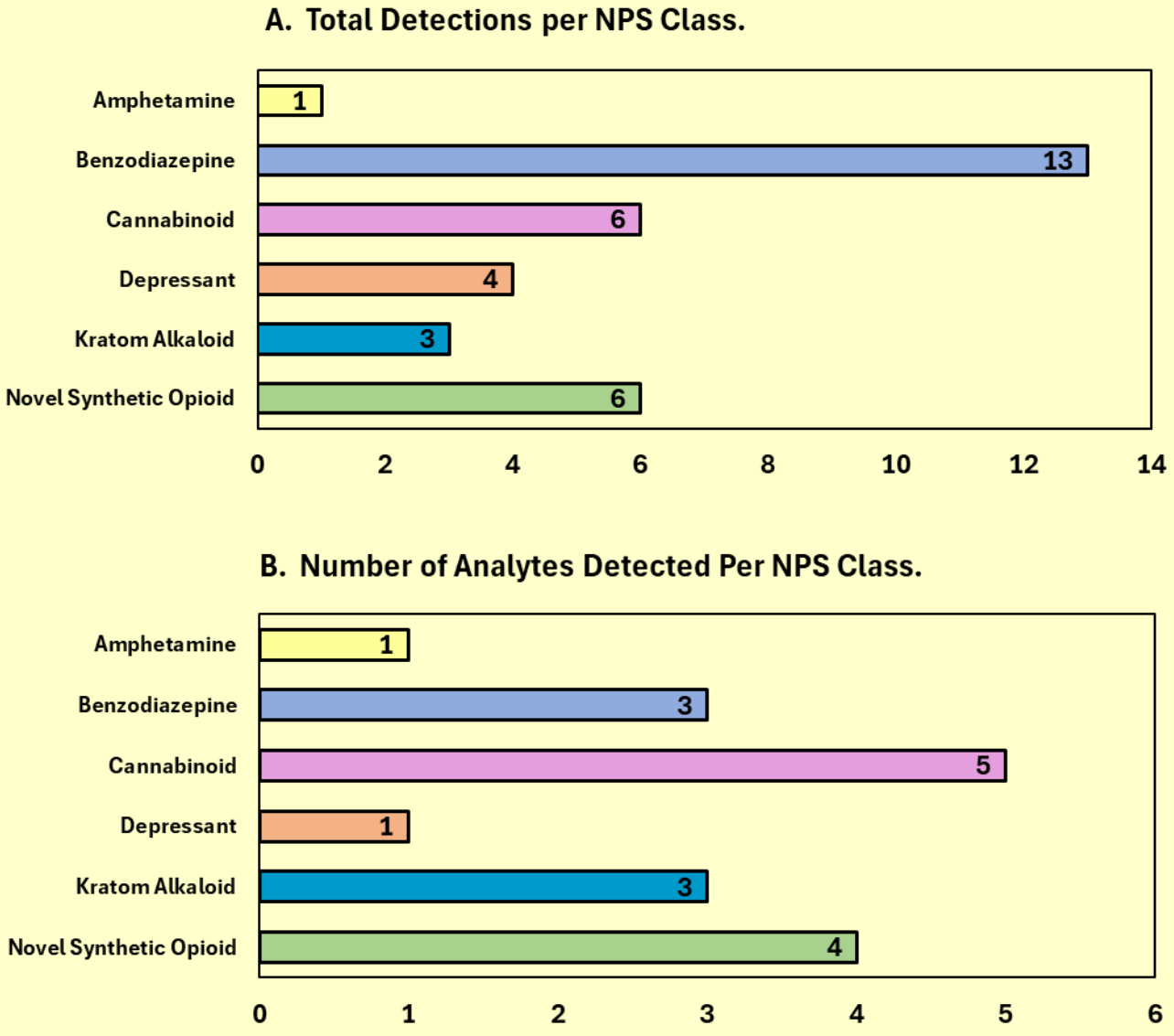


Table 1. NPS Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq. [Fatal]	States Found	Reported Concentrations (ng/mL)			
				S	P	WB	U
Amphetamine	MDDMA	1 [1]	FL		1.8		
Benzodiazepine	*Alpha*-Hydroxy Bromazolam**	5 [5]	TN(5)			0.7–8.5	
	Bromazolam	7 [6]	KS, TN(6)			0.2–135	
	Desalkylgidazepam	1 [1]	TN			0.4	
Cannabinoid	5F-ADB	1 [1]	FL			0.4	
	5F-ADB Acid Metabolite	2 [2]	FL(2)			5.8–5.9	
	ADB-BUTINACA	1 [1]	KS			17	
	MDMB-4en-PINACA	1	UT			12	
	MDMB-4en-PINACA Acid Metabolite	1	UT			159	
Depressant	Xylazine	4 [3]	MD, TN(2), UT			1.4–4.2	
Kratom Alkaloid	7-Hydroxy Mitragynine**	1 [1]	TX			8.8	
	Mitragynine	1 [1]	TX			2	
	Mitragynine Pseudoindoxyl**	1 [1]	TX			6.5	
Opioid	Despropionyl *para*-Fluorofentanyl	1 [1]	NE			0.9	
	N-Desethyl Protonitazene	1 [1]	TN			27.7	
	N-Pyrrolidino Protonitazene	2 [2]	TX(2)			0.6–7.9	
	para-Fluorofentanyl	2 [1]	KS, NE			1.0–9.0	

** These compounds are expected metabolites of parent drugs, which are listed below.

Expected Metabolite	Parent Drug
7-Hydroxy Mitragynine	Mitragynine
Mitragynine Pseudoindoxyl	Mitragynine

Expected Metabolite	Parent Drug
Alpha-Hydroxy Bromazolam	Bromazolam

Traditional Recreational Drugs

DEA TOX confirmed 293 detections of 27 TRD analytes (Table 2) in biological samples in 2025 Q2. TRD detections from drug products are described in Table 6.

Table 2. TRD Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq.	States Found	Reported Concentrations (ng/mL)			
				S	P	WB	U
Amphetamine	4-Hydroxy-3-Methoxy Methamphetamine**	2	FL(2)		1.6–2.8		
	4-Hydroxy Methamphetamine**	1	NE			18.8	
	Amphetamine	11	KY, NE(3), TN(3), WA(4)	28.4–153		2.6–544	18600
	MDA	1	FL		56.8		
	MDMA	2	FL(2)		1760–2850	2120	
	Methamphetamine	29	CA, FL, KS(2) KY(2), MD, NE(5), NM, TN(4), UT, WA(11)	4.7–3640	82.9	1.4–5980	36.2
	N,*N*-Dimethylamphetamine	2	NE(2)			5.3–33	
Arylcyclohexyl-amine	Ketamine	4	KY, NM, TN, WA	3.3–965	152	2290	
	Norketamine	3	KY, NM, WA	24.8–775	17.3		
Cannabinoid	11-nor-9-carboxy-delta-9-THC**	11	CA, KY(4) MD(2), MO, NM, TX, WA	50–329	120–313	59.3–201	60–400
	Delta-9-THC	1	TX		20.6		
Cocaine	Benzoylecgonine**	26	FL(4), KY(5), MD(2), NE(3), TN(3), WA(9)	4.9–13200	33.8–127	0.6–1210	15.7–257000
	Cocaethylene**	3	NE, WA(2)	NQ		NQ	

** These compounds are expected metabolites of parent drugs, which are listed on page 11.

Table 2 (Continued). TRD Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq.	States Found	Reported Concentrations (ng/mL)			
				S	P	WB	U
Cocaine	Cocaine	15	FL(2), KY, NE(2), TN, WA(9)	2.9–84.7	0.6–5.7		13200
	Ecgonine Methyl Ester**	17	FL(4), KY(2), NE(2), TN(3), WA(6)	NQ	NQ	NQ	NQ
Opioid	6-Acetylmorphine	1	UT			1.6	
	Beta-Hydroxy Fentanyl**	7	CA, TN(3), WA(3)	2.9–5		0.7–19.3	
	Codeine	2	TN, UT			7.6–10.9	
	Fentanyl	37	CA, FL, KS, KY(2), MD, NE(5), NM, TN(6), TX, UT, WA(17)	6.2–155		0.5–210	74.8
	Hydrocodone	1	KS			7.5	
	Morphine	3	TN, UT, WA	15.2		6.2–89.2	
	Norfentanyl**	31	CA, FL, KS, KY(2), MD, NE(5), TN(6), TX, UT, WA(12)	1.4–53		0.1–43.8	423
	O-Desmethyl-*cis*-Tramadol**	1	WA	88.1			
	Oxycodone	3	TN, WA(2)	18–22.2		579	
	Tramadol	1	WA	3180			

** These compounds are expected metabolites of parent drugs, which are listed on page 11.

Table 2 (Continued). TRD Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq.	States Found	Reported Concentrations (ng/mL)			
				S	P	WB	U
Stimulant Alkaloid	Cotinine**	43	CA(2), FL(3), KY(7), MD(8), MO, NE(5), NM, TN(7), TX(2), UT, WA(6)	NQ	NQ	NQ	NQ
	Nicotine	31	CA(2), FL, KS, KY(3), MD(6), NE(6), NM, TN(8), TX(2), UT			NQ	NQ

** These compounds are expected metabolites of parent drugs, which are listed below for Table 2:

Expected Metabolite	Parent Drug
4-Hydroxy-3-Methoxy Methamphetamine	MDMA
4-Hydroxy Methamphetamine	Amphetamine/ Methamphetamine
11-nor-9-carboxy-delta-9-THC	Delta-9-THC
Benzoylecgonine	Cocaine
Cocaethylene	Cocaine and Alcohol
Ecgonine Methyl Ester	Cocaine

Expected Metabolite	Parent Drug
Beta-Hydroxy Fentanyl	Fentanyl
Hydromorphone	Hydrocodone
Norfentanyl	Fentanyl
O-Desmethyl-*cis*-Tramadol	Tramadol
Cotinine	Nicotine

Over-the-Counter and Prescription Drugs

DEA TOX confirmed 225 detections of 62 OTC/PD analytes (Table 3) in 2025 Q2. OTC/PD analytes detected from drug products are described in Table 6. OTC/PD detections are not typically quantitated unless specifically requested; thus, reported concentration ranges are not provided.

Table 3. OTC/PD Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq.	States Found
Anesthetic	Etomidate	2	FL, TX
	Lidocaine	16	FL(3), KY, MD, NE(2), TN(3), WA(6)
	Medetomidine	1	TN
Antibiotic	Sulfamethoxazole	1	MO
Anticonvulsant	Gabapentin	10	KY(2), MD, NE, TN(3), WA(3)
	Lamotrigine	2	TN, WA
	Levetiracetam	4	KY(2), TX, WA
	Oxcarbazepine	1	NM
	Pregabalin	2	NE, TN
Antidepressant	Citalopram	4	TN(3), WA
	Fluoxetine	1	TN
	mCPP**	4	MD(2), WA(2)
	Mirtazapine	3	NE, NM, WA
	Norfluoxetine**	1	TN
	Nortriptyline**	1	TN
	Paroxetine	1	WA
	Sertraline	1	TX
	Trazodone	4	MD(2), WA(2)
	Venlafaxine	1	WA
Antidiabetic	Metformin	1	WA
Antidiarrheal	Loperamide	1	MD
Antihistamine	Brompheniramine	1	KY
	Chlorpheniramine	3	MD, TN(2)
	Diphenhydramine	7	FL, KY, TN(4), TX
	Doxylamine	4	NE, TN, TX, WA
	Hydroxyzine	2	NE, WA
	Promethazine	3	MD, TX(2)

** These compounds are expected metabolites of parent drugs, which are listed below:

Expected Metabolite	Parent Drug
Norfluoxetine	Fluoxetine
*m*CPP	Trazodone

Expected Metabolite	Parent Drug
Nortriptyline	Amitriptyline

Table 3 (Continued). OTC/PD Analytes Detected in Biological Samples.

Drug Class	Analytes	Freq.	States Found
Antipsychotic	Aripiprazole	2	MD, WA
	Droperidol	1	KY
	Haloperidol	1	KY
	Olanzapine	3	TN(2), WA
	Quetiapine	3	KY(2), WA
	Risperidone	2	KY, WA
Antiretroviral	Emtricitabine	1	FL
Anxiolytic	Buspirone	2	TN(2)
Benzodiazepine	7-Amino Clonazepam**	8	KY, MD(2), TN(3), WA(2)
	Alpha-Hydroxy Alprazolam**	3	MD(2), TN
	Alpha-Hydroxy Midazolam**	4	FL, KY, MO, TX
	Alprazolam	9	KS, MD(2), NE, TN(2), TX(2), WA
	Clonazepam	6	KY, MD, TN(2), WA(2)
	Lorazepam	6	FL(2), KY(2), MO, TX
	Midazolam	5	FL, MO, NE(2), TX
	Nordiazepam**	3	KY, NM, TX
Cardiovascular	3-Amino-1-Phenylbutane**	2	MO, TN
	Amiodarone	3	FL(2), KY
	Atropine	2	FL, TN
	Clonidine	3	MD, NE, TN
	Labetalol	2	MO, TN
	Lisinopril	1	WA
	Metoprolol	3	FL, MD, TN
	Propranolol	1	NE
Cough Suppressant	Dextromethorphan	6	KY, NE, WA(4)
	Dextrorphan	2	KY, WA
Decongestant	Pseudoephedrine	2	KY, WA

** These compounds are expected metabolites of parent drugs, which are listed below:

Expected Metabolite	Parent Drug
3-Amino-1-Phenylbutane	Labetalol
7-Amino Clonazepam	Clonazepam
Alpha-Hydroxy Alprazolam	Alprazolam

Expected Metabolite	Parent Drug
Alpha-Hydroxy Midazolam	Midazolam
Dextrorphan	Dextromethorphan
Nordiazepam	Diazepam

Table 3 (Continued). OTC/PD Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq.	States Found
Muscle Relaxant	Baclofen	1	NE
	Cyclobenzaprine	3	WA(3)
	Metaxalone	1	TN
Opioid	Buprenorphine	1	TN
	EDDP**	3	KY, NE, TN
	Methadone	3	NE, TN(2)
Opioid Antagonist	Naloxone	13	FL(3), IL, KS, KY(2), MD, MO, NE(2), TN, TX
Pain Reliever	Acetaminophen	26	CA, KS, LA, NE(4), NM(2), TN(5), UT, WA(11)

** This compound is an expected metabolite of a parent drug, which is listed below:

Expected Metabolite	Parent Drug
EDDP	Methadone

Dietary Supplement Stimulants

DEA TOX confirmed 50 detections of 2 DSS analytes (Table 4) in biological samples in 2025 Q2. DSS analytes detected from drug products are described in Table 6.

Table 4. DSS Analytes Detected in Biological Samples.

Analyte	Freq.	States Found
Caffeine	47	CA(2), FL(5), KY(4), LA, MD(4), NE(6), NM, TN(9), TX(2), UT, WA(12)
Melatonin	1	TN

Precursors/Additives/Impurities

DEA TOX confirmed 29 detections of 3 P/A/I analytes (Table 5) in biological samples in 2025 Q2. P/A/I analytes detected from drug products are described in Table 6.

Table 5. P/A/I Detected in Biological Samples.

Drug Class	Analyte	Freq.	States Found	Reported Concentration (ng/mL)			
				S	P	WB	U
Precursor	4-ANPP	18	CA, FL, KS, MD, NE(3), TN(6), WA(5)	3.6–23.9		0.3–17.4	
Adulterant	2,2,6,6-Tetramethyl-4-piperidinol	1	WA	1480			
	Quinine	10	CA, KY(2), MD, TN(5), WA	19.2		1.7–186	82.1

Drug Products

DEA TOX confirmed 95 detections of 22 analytes (Table 6) in 27 drug products analyzed in 2025 Q2.

Table 6. Analytes Detected in Drug Products.

Drug Category	Drug Class	Analyte	Freq.	States Found	Reported Level*
NPS	Kratom Alkaloid	7-Hydroxy Mitragynine	1	LA	29 mg
		Mitragynine	1	LA	580 µg
		Mitragynine Pseudoindoxyl	1	LA	340 µg
	Opioid	Acetyl Fentanyl	6	WA(6)	7.9–60 µg
TRD	Amphetamine	Methamphetamine	3	WA(3)	15 µg–9.5 mg
	Cocaine	Benzoylecgonine	3	WA(3)	33–330 µg
		Cocaine	4	WA(4)	18–120 mg
		Ecgonine Methyl Ester	1	WA	36 µg
	Opioid	Fentanyl	21	FL, WA(20)	27 µg–24 mg
		Norfentanyl	3	WA(3)	3.0–46 µg
		Oxycodone	1	FL	84 µg–7.2 mg
	Tryptamine	Psilocin	1	CA	1.6–1.8 mg
		Psilocybin	1	CA	51–53 mg
PD	Anesthetic	Lidocaine	5	WA(5)	9.5 µg–6.8 mg
	Cough Suppressant	Dextromethorphan	1	WA	83 µg
	Pain Reliever	Acetaminophen	12	FL(1), WA(11)	3.3–350 mg
DSS	Stimulant	Caffeine	1	CA	14–102 mg
		Theobromine	1	CA	NQ
P/A/I	Precursor	4-ANPP	17	FL, WA(16)	6.8 µg–5.5 mg
	Additive	2,2,6,6-Tetramethyl-4-piperidinol	1	WA	24 µg
		Bis-(2,2,6,6-tetramethyl-4-piperidyl) sebacate	1	WA	23 mg
		Levamisole	1	WA	25 mg

* This range indicates the low and high values of the total amount detected for a substance within drug products.

Select Drug Product Exhibits:

Table 7. Drug Product Exhibit #1.

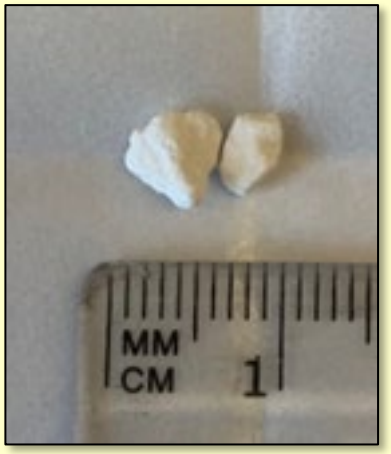
Total Exhibit Weight: 100.7 mg

Drug Category	Analyte	State Found	Reported Level	Actual Amount within Drug Product
TRD	Fentanyl	WA	2.6 mg/g	260 µg
PD	Acetaminophen		100 mg/g	10 mg
	Lidocaine		68 mg/g	6.8 mg
P/A/I	2,2,6,6-Tetramethyl-4-piperidinol		240 µg/g	24 µg
	Bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate		230 mg/g	23 mg
	4-ANPP		290 µg/g	29 µg

Table 8. Drug Product Exhibit #2.

Total Exhibit Weight: 49.8 mg

Drug Category	Analyte	State Found	Reported Level	Actual Amount within Drug Product
NPS	Acetyl Fentanyl	WA	360 µg/g	18 µg
TRD	Fentanyl		490 mg/g	24 mg
	Norfentanyl		60 µg/g	3.0 µg
P/A/I	4-ANPP		110 mg/g	5.5 mg



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.
            - The main reason for disapproval of a case would be the identification of substances (including methamphetamine, heroin, fentanyl, cocaine, LSD, PCP, etc.) in a routine toxicology screening at your facility.
            - 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).
    - 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.

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Clinical Toxicology
and Environmental Biomonitoring Laboratory

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