DEA TOX

DRUG ENFORCEMENT ADMINISTRATION

TOXICOLOGY TESTING PROGRAM

QUARTERLY REPORT

2025 First 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
KY	Kentucky
LA	Louisiana
MD	Maryland
NE	Nebraska
NJ	New Jersey
NM	New Mexico
NY	New York
OH	Ohio
OR	Oregon
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
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 1,314 drugs, of which 1,028 are NPS.

This publication presents the results of cases received and analyzed by the CTEB Laboratory during the first quarter [January 1–March 31] of 2025 (2025 Q1). 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 Q1, DEA TOX received 104 samples from 88 cases originating from 16 states: California [5], Florida [3], Illinois [3], Kentucky [19], Louisiana [4], Maryland [15], Nebraska [9], New Jersey [1], New Mexico [1], New York [1], Ohio [7], Oregon [4], Tennessee [12], Texas [1], Utah [1] and Washington [2]. These samples included 98 biological samples [12 serum, 6 plasma, 57 whole blood, 22 urine, and 1 muscle tissue] and 6 drug products. Of these cases, 11 cases had multiple biological samples analyzed and 3 cases had multiple drug products tested.

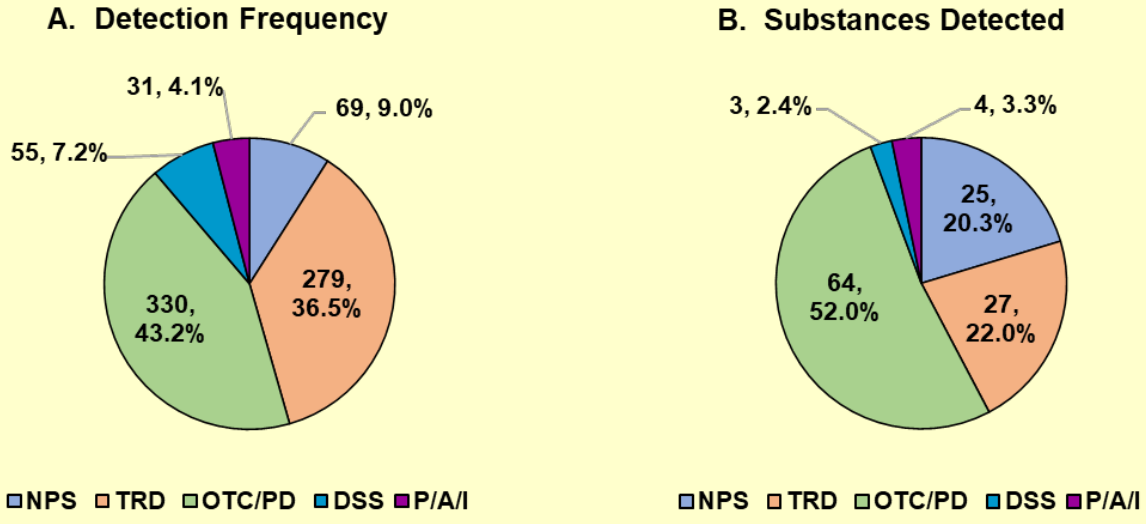
DEA TOX analyzed these samples for NPS; traditional recreational drugs (TRD); over-the-counter (OTC) or prescription drugs (PD); dietary supplement stimulants (DSS); and precursors, additives, or impurities (P/A/I). DEA TOX did not detect analytes in two of these samples.

During 2025 Q1, DEA TOX reported a total of 764 detections across biological and drug product samples (Figure 1A), spanning 123 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, 36 (40.9%) of the 88 cases involved at least one NPS analyte. In addition, 23 (26.1%) of the 88 cases involved 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 69 total detections comprised of 25 NPS analytes across all 2025 Q1 samples. In biological samples, 36 cases were analyzed, resulting in 67 detections (Figure 2A and Table 1) that consisted of 25 NPS analytes (Figure 2B) from 5 different drug classes. NPS detections in drug products are described in Table 6.

Figure 2. NPS Substance Detections.

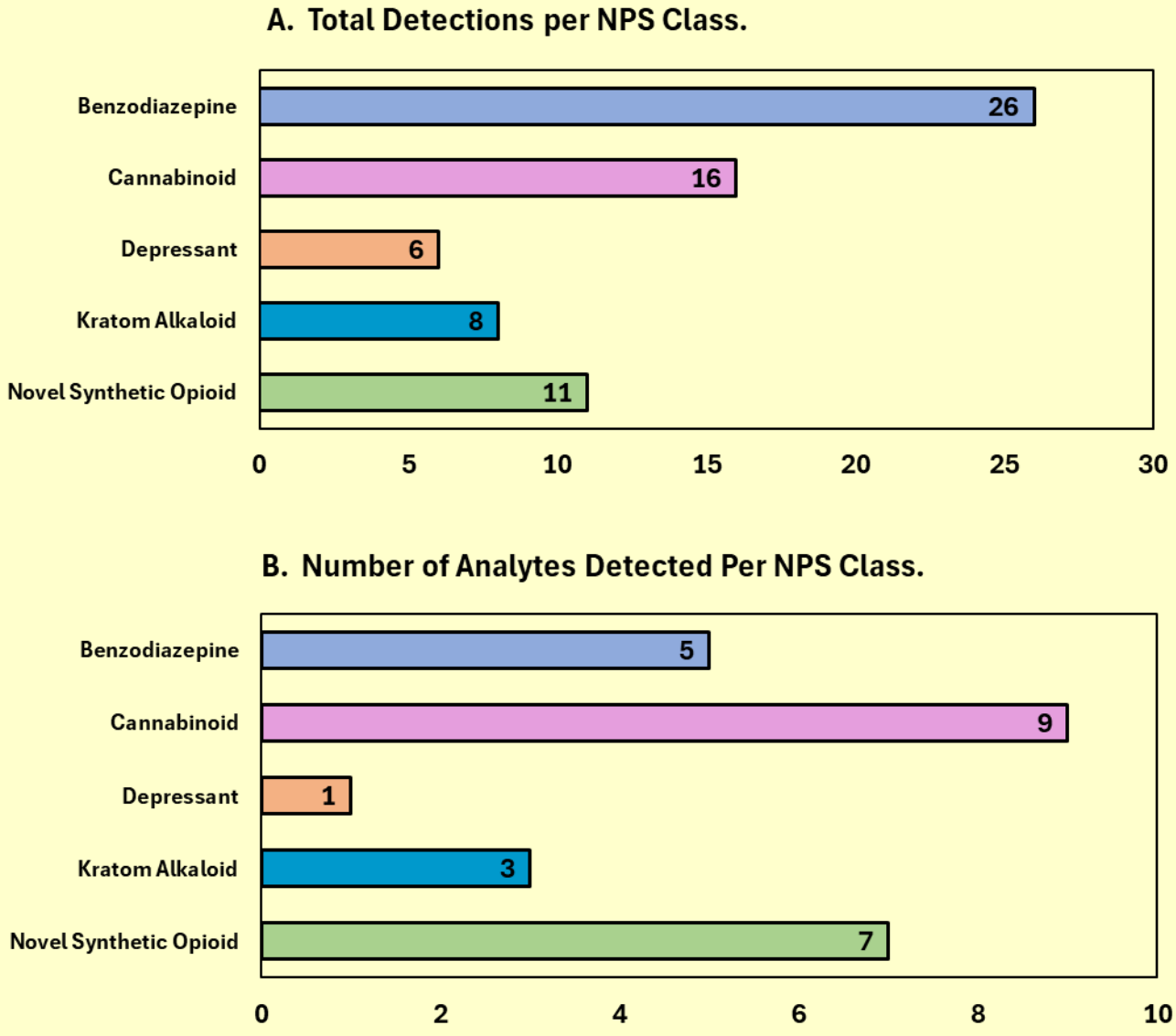


Table 1. NPS Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq. [Fatal]	States Found	Reported Concentrations (ng/mL)			
				S	P	WB	U
Benzodiazepine	8-Amino Clonazolam	2 [1]	KY, TN			1.7–3.2	
	Alpha-Hydroxy Bromazolam**	4 [3]	IL, LA, TN(2)	7.1		0.4–1	
	Bromazolam	14 [11]	IL, LA, MD, NE, NJ, OR, TN(8)	0.6–63	2.9	0.1–22.5	
	Clonazolam	1 [0]	KY			0.8	
	Desalkylgidazepam	4 [4]	MD(2), TN(2)			0.8–38.6	
Cannabinoid	11-nor-9-Carboxy-delta-8-THC**	4 [0]	KY(2), OH(2)			765	354–434
	4-CN-CUMYL-BUTINACA	1 [0]	KY			0.3	
	5F-ADB	1 [1]	MD			1.8	
	5F-ADB acid metabolite	1 [2]	MD(2)			9.3–387	
	ADB-BUTINACA	1 [0]	KY			7.8	
	ADB-INACA	1 [0]	KY			9.4	
	Delta-8-THC	1 [0]	KY			21.5	
	MDMB-4en-PINACA	2 [2]	MD(2)			0.3–7.3	
	MDMB-4en-PINACA acid metabolite	3 [2]	MD(2) UT			4.2–101	67.2
Depressant	Xylazine	6 [6]	MD(2), NE(2), TN, TX			4.9–267	

** These compounds are expected metabolites of parent drugs, which are listed on page 9.

Table 1 (Continued). NPS Analytes Detected in Biological Samples.

Drug Class	Analyte	Freq. [Fatal]	States Found	Reported Concentrations (ng/mL)			
				S	P	WB	U
Kratom Alkaloid	7-Hydroxy Mitragynine**	1 [1]	LA			37.3	4360
	Mitragynine	4 [4]	LA, NE(2), TN			0.3–28.3	
	Mitragynine Pseudoindoxyl**	1 [1]	LA			76	204
Opioid	Despropionyl *para*-Fluorofentanyl	2 [2]	TN(2)			0.1–0.3	
	N-Pyrrolidino Protonitazene	1 [1]	TX			0.4	
	ortho-Methylfentanyl	2 [2]	MD(2)			46.4–68.6	
	ortho-Methylnorfentanyl	2 [2]	MD(2)			22.7–80	
	para-Fluorofentanyl	2 [2]	TN (2)			3.9–6.9	
	Protonitazene	1 [1]	MD			50.2	
	Tianeptine	1 [1]	TN			1.6	

** These compounds are expected metabolites of parent drugs, which are listed below for Table 1 :

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

Expected Metabolite	Parent Drug
Alpha-Hydroxy Bromazolam	Bromazolam
11-nor-9-Carboxy-delta-8-THC	Delta-8-THC

Traditional Recreational Drugs

DEA TOX confirmed 271 detections of 25 TRD analytes (Table 2) in biological samples in 2025 Q1. 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 Methamphetamine**	2	KY(2)				2000–2780
	Amphetamine	8	KY(3), NE, OR, TN(2), WA	208		17.9–383	233–7460
	MDMA	1	TN			44	
	Methamphetamine	21	CA, KY(4), MD(2), NE(4), NM, NY, OR, TN(5), WA(2)	628		2.0–12200	17.9–392000
	N,*N*-Dimethylamphetamine	5	KY(2), TN(2), WA			3.6–8.4	11.7–2960
Arylcyclohexylamine	Ketamine	12	KY(3), NE, NY, OR(2), TN(5)		1.1–193	0.6–157	989
Cannabinoid	11-nor-9-carboxy-delta-9-THC**	13	FL, IL(2), KY(3), LA(2), MD, NE, OH(3)	95–171	56.6	32.1–719	6.1–405
	Delta-9-THC	5	FL, LA(2), MD, TN			8–41.3	
Cocaine	Benzoylecgonine**	15	CA, KY(5), MD, NE(5), OR, TN(2)		1.1	3.6–21000	11.7–415000
	Cocaethylene**	4	KY, MD, NE(2)			NQ	NQ

** These compounds are expected metabolites of parent drugs, which are listed on page 12.

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	9	CA, KY, MD, NE(4), TN(2)			0.1–15000	22400
	Ecgonine Methyl Ester**	11	CA, KY(4), MD, NE(3), TN(2)			NQ	NQ
Opioid	*Beta*-Hydroxy Fentanyl**	7	KY(2), NE, TN(2), WA(2)			0.3–12.4	7
	Codeine	2	KY, NE			0.4–2.4	
	Desmethyl-*cis*-Tramadol**	3	KY, LA, MD			5.1–114	
	Fentanyl	23	CA, IL(3), KY(2), NE(2), NJ, NY, OR, TN(10), WA(2)	1.3–5.6	1.4–3.3	0.9–150	60–64.1
	Hydrocodone	2	NE, TN			11.8–198	
	Hydromorphone**	1	TN			20.6	
	Morphine	2	KY, NE			8.6–139	
	Norfentanyl**	21	CA, IL(3), KY(2), NE(2), NJ, NY, OR, TN(8), WA(2)	0.7–2.8	0.9–4.0	0.2–18.4	131–1010
	Oxycodone	1	MD			14.9	
	Tramadol	3	KY, LA, MD			36.5–507	

** These compounds are expected metabolites of parent drugs, which are listed in page 12.

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	36	CA, FL(2), KY(13), LA(3), MD(3), NE(3), OH, OR, TN(7), TX, UT	NQ		NQ	NQ
	Nicotine	36	CA, FL(2), KY(11), LA(3), MD(4), NE(3), NM, OH, OR, TN(8), TX, UT	NQ		NQ	NQ
	Nornicotine	5	CA, KY(4)				NQ

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

Expected Metabolite	Parent Drug
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
Beta-Hydroxy Fentanyl	Fentanyl

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

Over-the-Counter and Prescription Drugs

DEA TOX confirmed 330 detections of 64 OTC/PD analytes (Table 3) in 2025 Q1. OTC/PD analytes were not detected in drug products this quarter and therefore not 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	CA, OH
	Lidocaine	17	CA(2), IL, KY, MD(2), NE(3), NJ, TN(7)
	Medetomidine	2	KY, OR
Antibiotic	Linezolid	1	CA
Anticonvulsant	Gabapentin	11	KY, LA, MD(2), NE(2), TN(5)
	Lamotrigine	2	KY, MD
	Levetiracetam	6	IL, KY, NE, NJ, NY, OH
	Pregabalin	1	NE
Antidepressant	Amitriptyline	2	MD, NJ
	Citalopram	3	MD(2), TN
	Fluoxetine	2	KY, LA
	*m*CPP**	1	KY(2), LA, MD, TN, UT
	Mirtazapine	3	KY(2), TN
	Nordoxepin**	1	LA
	Norfluoxetine**	2	KY, LA
	Nortriptyline**	2	KY, LA
	Sertraline	7	CA, KY, MD(3), NJ, TN
	Trazodone	5	KY, LA, MD, TN, UT
Antidiarrheal	Loperamide	3	KY, LA, TN
Antihistamine	Diphenhydramine	14	KY(5), LA, MD(2), NE, NM, OR, TN(3)
	Doxylamine	3	CA, FL, KY
	Hydroxyzine	4	MD(2), TN(2)
	Loratadine	1	LA
	Promethazine	6	CA, IL, LA, NE, OR, TN

** 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
Nordoxepin	Doxepin
Nortriptyline	Amitriptyline

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

Drug Class	Analytes	Freq.	States Found
Antipsychotic	Aripiprazole	5	CA, KY, MD, NE, TN
	Chlorpromazine	1	KY
	Droperidol	4	KY(3), OR
	Haloperidol	2	IL, KY
	Olanzapine	5	KY, MD(2), NE, TN
	Quetiapine	2	TN(2)
Antiretroviral	Emtricitabine	2	KY, NJ
Anxiolytic	Buspirone	1	MD
Benzodiazepine	7-Amino Clonazepam**	5	KY, LA, TN(2), TX
	Alpha-Hydroxy Alprazolam**	3	CA, KY, NE
	Alpha-Hydroxy Midazolam**	9	KY(5), NJ, NY, OH, OR
	Alprazolam	11	CA, KY, LA(2), MD(2), NE, NJ, TN(2), TX
	Clonazepam	3	KY, LA, TN
	Diazepam	4	KY, NE, OR, TN
	Lorazepam	2	KY, OR
	Midazolam	9	IL, KY(5), NJ, NY, OH
	Nordiazepam**	7	KY(2), MD, NE, OH, OR, TN
	Oxazepam**	1	KY
	Temazepam**	1	KY
Bronchodilator	Albuterol	2	IL(2)
Cardiovascular	Amiodarone	1	MD
	Atenolol	1	MD
	Atorvastatin	2	NE(2)
	Atropine	3	CA, NJ, TN
	Clonidine	1	MD
	Lisinopril	1	KY
	Metoprolol	2	NE, TN
Cough Suppressant	Dextromethorphan	9	CA, FL(2), KY(3), LA, OR, TN
	Dextrorphan	7	CA, FL(2), KY(2), LA, OR
Decongestant	Pseudoephedrine	1	WA
Diuretic	Furosemide	1	NE

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

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

Expected Metabolite	Parent Drug
Nordiazepam	Diazepam
Oxazepam	Diazepam
Temazepam	Diazepam

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

Drug Class	Analyte	Freq.	States Found
Muscle Relaxant	Baclofen	1	NE
	Cyclobenzaprine	6	CA, KY, MD(3), NJ
	Methocarbamol	3	MD, TN(2)
Opioid	Buprenorphine	3	KY(2), TN
	EDDP**	5	KY, NE, NJ, OR, TN
	Methadone	6	KY, MD, NE, NJ, OR, TN
Opioid Antagonist	Naloxone	18	CA, FL, KY(5), LA(2), MD(6), NY, TN, UT
	Naltrexone	2	NJ, UT
Pain Reliever	Acetaminophen	24	CA, FL, IL(2), KY(8), MD, NE(4), NJ, NY, OH, OR, TN(2), UT

** 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 46 detections of 2 DSS analytes (Table 4) in biological samples in 2025 Q1.

Table 4. DSS Analytes Detected in Biological Samples.

Analyte	Freq.	States Found
Caffeine	45	CA(2), FL(2), KY(9), LA(2), MD(5), NE(6), NJ, NM, OH, OR(2), TN(12), TX, UT
Melatonin	1	CA

Precursors/Additives/Impurities

DEA TOX confirmed 31 detections of 3 P/A/I analytes (Table 5) in biological samples in 2025 Q1. P/A/I analytes were not detected in drug products this quarter and therefore not 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	13	CA, KY, NE(2), TN(7), WA(2)			0.2–8.6	
Adulterant	2,2,6,6-Tetramethyl-4-Piperidinol	2	NJ, TN	6.5–9.6		5.6–62.3	
	Levamisole	1	KY			0.7	247
	Quinine	9	KY(2), MD(2), NJ, TN(4)	2.2–2.4		1–157	32.1

Drug Products

DEA TOX confirmed 18 detections of 5 analytes (Table 6) in 6 drug product samples analyzed in 2025 Q1.

Table 6. Analytes Detected in Drug Products.

Drug Category	Drug Class	Analyte	Freq.	States Found	Reported Level*
NPS	Kratom Alkaloid	Mitragynine	1	OR	4.8–4.9 mg
TRD	Tryptamine	Psilocybin	2	CA(2)	39–55 mg
		Psilocin	2	CA(2)	740 µg–2.2 mg
DSS	Stimulant	Caffeine	2	CA(2)	2.9–15 mg
		Theobromine	2	CA(2)	NQ

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

Select Drug Product Exhibit:

Table 7. Drug Product Exhibit #1.

Total Exhibit Weight: 737.0 mg (602.0 mg brown powder within capsule)

Drug Category	Analyte	State Found	Reported Level	Actual Amount within Drug Product
NPS	Mitragynine	OR	8.2 mg/g	4.9 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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