

# Illegal Drugs Seized in Iowa – A Primer

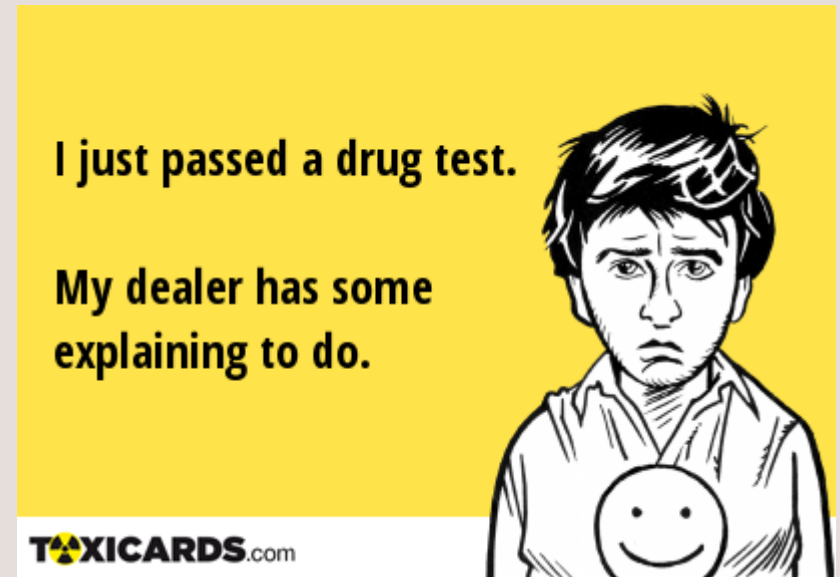
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AMANDA KILGORE, DCI CRIME LAB

# Objectives

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- Visually identify common controlled substances
- Understand administration methods of controlled substances
- Recognize drug paraphernalia
- Correlate drug paraphernalia to appropriate controlled substances
- Proper handling of controlled substances - safety precautions
- Proper packaging of controlled substance for preservation and submission
- General knowledge of drug and overdose trends



# Methamphetamine



# Methamphetamine

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- Synthesized in Germany in 1887, used by soldiers in World War II
- Schedule II (Desoxyn Rx obesity treatment)
- Central nervous system stimulant
  - Physiological effects
    - Increased heart rate, blood pressure, respiration and body temperature
    - Decreased appetite
    - Irregular heartbeat, dry mouth, abdominal cramps, twitching, dilated pupils
  - Psychological effects
    - Immediate intense euphoric high which fades quickly
    - Anxiousness, nervousness, irritability, aggression
    - Increased alertness, energy, libido, confidence, wakefulness
    - Decreased sleep
  - Users fall into a “binge and crash” pattern





# Methamphetamine Forms & Colors

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## Forms of Crystal Meth



Crystal Meth



Powdered  
Crystal Meth



Meth Pills

## Various Colors of Meth



Blue Meth



Clear Meth



Pink Meth

# Methamphetamine - Illicit Tablets

- Used to be seen as MDMA
- Now almost all seen as meth, meth/caffeine mixtures
- Some containing eutylone or other novel cathinones
- Occasional counterfeit Adderall containing meth

Fake Adderall Made from Meth



30 mg Adderrall Tablet



Fake Adderall Tablet  
Made from Meth



# Methamphetamine Paraphernalia

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- Glass pipes
- Light bulbs, tin foil, aluminum cans
- Needles and syringes
- Plastic bags
- Hollow pen tubes and cut straws
- Bongs, commercial or homemade





# Methamphetamine – Clandestine Labs

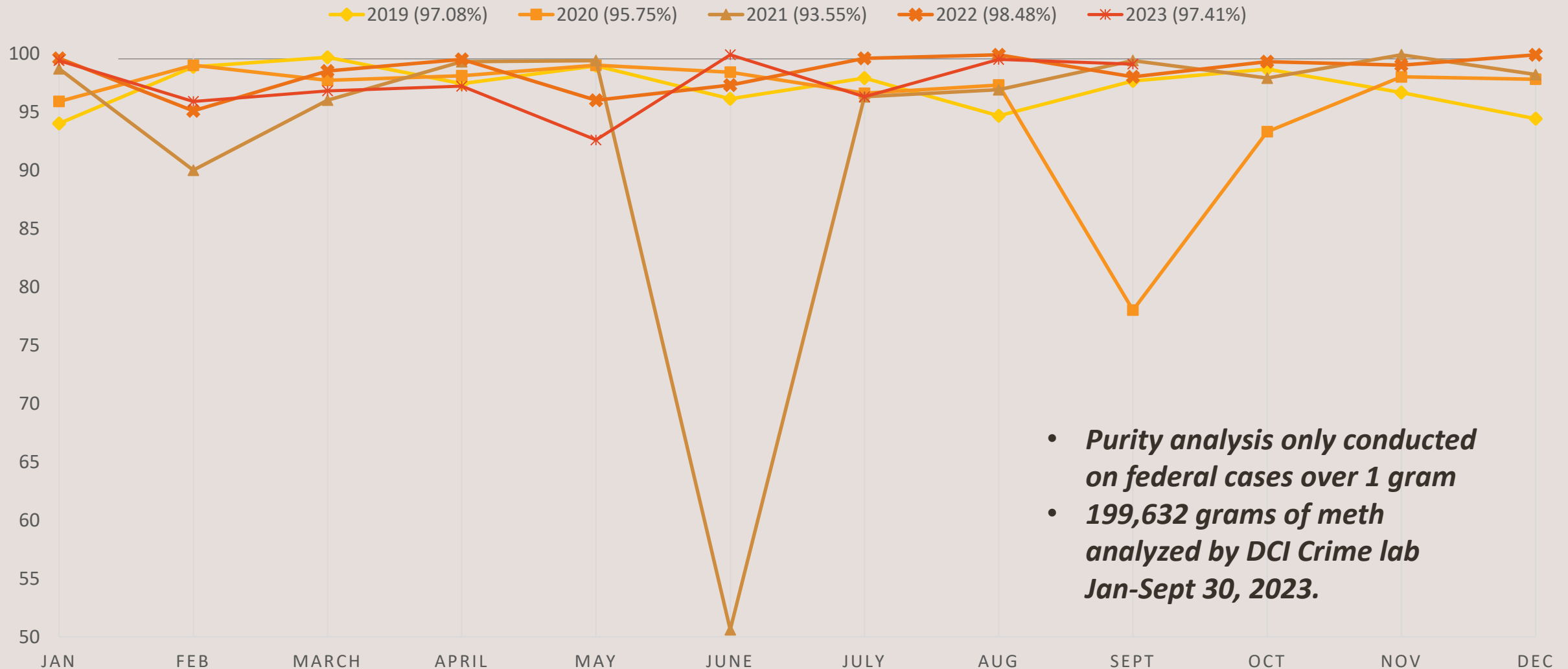
- Control of pseudoephedrine caused massive decrease in number of clan labs
- Crystal meth is readily available and pure





# Methamphetamine Purity Trends

## AVERAGE PURITY PER YEAR



- ***Purity analysis only conducted on federal cases over 1 gram***
- ***199,632 grams of meth analyzed by DCI Crime lab Jan-Sept 30, 2023.***

\*2023 is preliminary and only includes data through September 30<sup>th</sup>

# Cannabis

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Below 0.3% THC = Hemp

At or above 0.3% THC = Marijuana



# Cannabis in Iowa

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-2014: Legalization of CBD oil

-2017: Expansion of medical marijuana

Medical Cannabidiol Act expanded the number for diseases for treatment

Allows the use of CBD that has no more than 3% THC

-2018: Federal Farm Bill

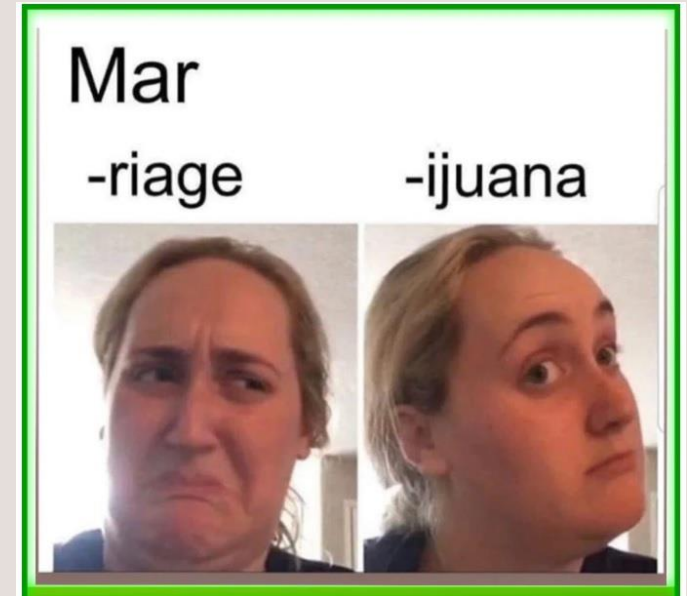
Legal to grow hemp, makes distinction between hemp and marijuana

-2020: Further expansion of medical marijuana

Replaced 3% limit THC with cap of 4.5G/patient in 90-days

-2023: Proposed legislation to legalize marijuana

Marijuana reform legislation failed to advance





# 2023 Proposed Cannabis Legislation

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- Democratic lawmakers introduce legislation to legalize recreational MJ

- Regulate commercial cannabis sales and tax licensed marijuana sales

- Decrease penalties for MJ possession and expunge records for non-violent marijuana convictions



Legislation would legalize up to 500 mg of THC for adults 21 and over

# Cannabis – Plant Material

## -Plant material

- Buds
- Grinders
- Glass, metal, wood and homemade pipes
- Joints
- Bongs



## -THC levels

- 60's ~2%
- 90's ~4%
- Current ~15%
- Very high strains 20-25%



# Cannabis

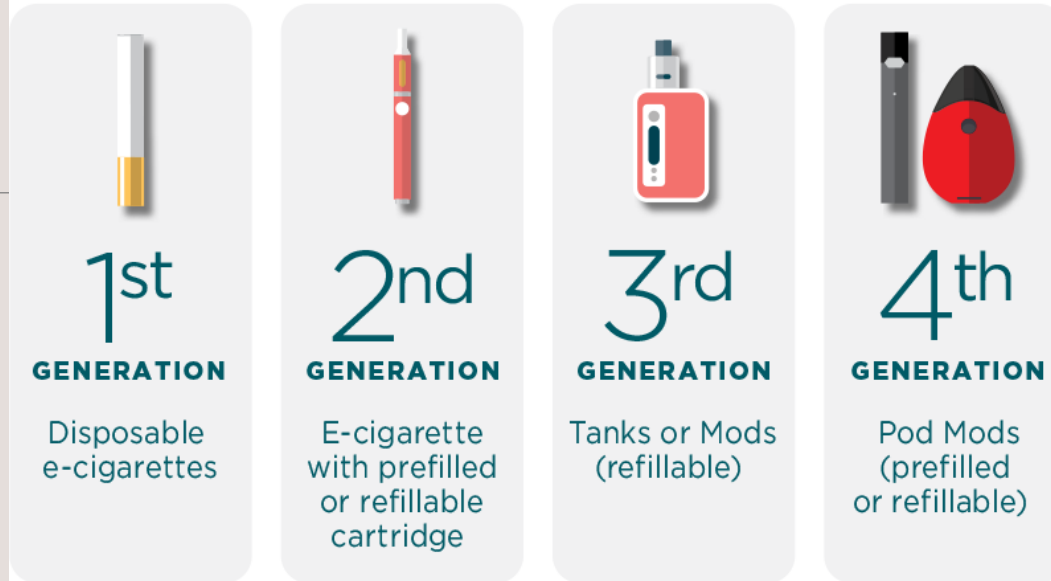
-Concentrates -  
“dabbing”

- Wax, shatter, oil, budder
- THC levels 75-95%

-E-cigarette  
generally one use,  
throw away

-Vape pen  
rechargeable  
battery, refillable  
tank or swap  
cartridge

## The Evolution of E-Cigarette, or Vaping, Products





# Cannabis - Concentrates

## CANNABIS CONCENTRATES



### **CRUMBLE**

Dried oil with a honey-comb like consistency



### **BADDER/BUDDER**

Concentrates whipped under heat to create a cake-batter like texture



### **SHATTER**

A translucent, brittle, & often golden to amber colored concentrate made with a solvent



### **DISTILLATE**

Refined cannabinoid oil that is typically free of taste, smell & flavor. It is the base of most edibles and vape cartridges



### **CRYSTALLINE**

Isolated cannabinoids in their pure crystal structure



### **DRY SIFT**

Ground cannabis filtered with screens leaving behind complete trichome glands. The end-product is also referred to as kief



### **ROSIN**

End product of cannabis flower being squeezed under heat and pressure



### **BUBBLE HASH**

Uses water, ice, and mesh screens to pull out whole trichomes into a paste-like consistency



# Cannabis - Edibles

## -Edibles

- Typically found in 2.5mg, 5mg and 10mg THC dosages
- Easy to consume too much too quickly
- Pose significant risk toward children
- New preparations constantly hitting the market
- Products containing THC content  $<0.3\%$  by weight are legal in Iowa



Orange Mango

0 Calories | 2.5mg THC | 5mg CBD | 0% ABV



### Pineapple Passion Fruit

0 Calories | 5mg THC | 10mg CBD | 0% ABV

# Cannabis – Delta 8 THC

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## -Delta 8 THC

- Found naturally in small traces in cannabis plants
- Large quantities can be synthesized from CBD
- Legal in most states, NOT Iowa
- Sold as vapes, gummies and other edibles
- Adverse event reports
  - Hallucinations, vomiting, tremor, anxiety, confusion, loss of consciousness



-Not explicitly stated to be illegal in the Iowa Code

-A sample high in  $\Delta 8$ -THC has most likely been synthetically produced and has been manufactured from hemp with high CBD content

- This *could* fall under Iowa Code Chapter 124.204 as a “synthetic equivalent of the substances contained in the Cannabis plant” or “derivative or isomer with similar chemical structure and pharmacological activity”
- We have no way of knowing the source of the  $\Delta 8$ -THC found in a sample - naturally occurring or synthetically produced?
- The law is unclear if “hemp-derived  $\Delta 8$ -THC” is legal/illegal
- Some areas are prosecuting, some are not



# Synthetic Cannabinoids

-Laboratory-made chemicals sprayed on dried plant material

- Spice or floral odor
- Plant material is inert
- Act on same brain cell receptors as THC

-Thousands of chemicals

- New compounds emerging, laws can't keep up
- Some isomers are not explicitly scheduled, but may be controlled due to being an isomer of a controlled substance
- Examples
  - 4-fluoro MDMB-BUTICA
  - 5-fluoro MDMB-PICA (Schedule I)
  - ADB-BUTINACA (Schedule I)
  - MDMB-4en-PINACA

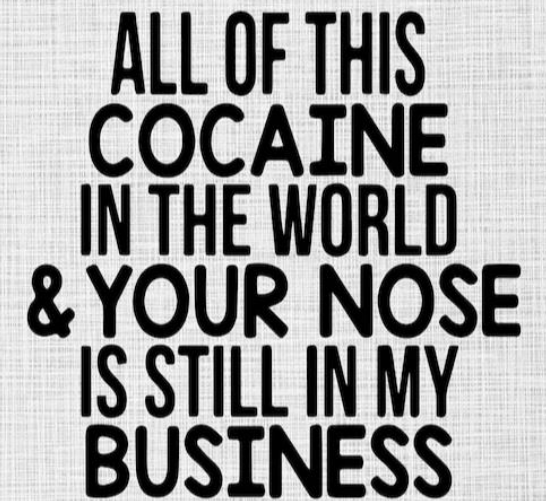
-Still popular in prison settings, sprayed on paper and mailed in



# Cocaine

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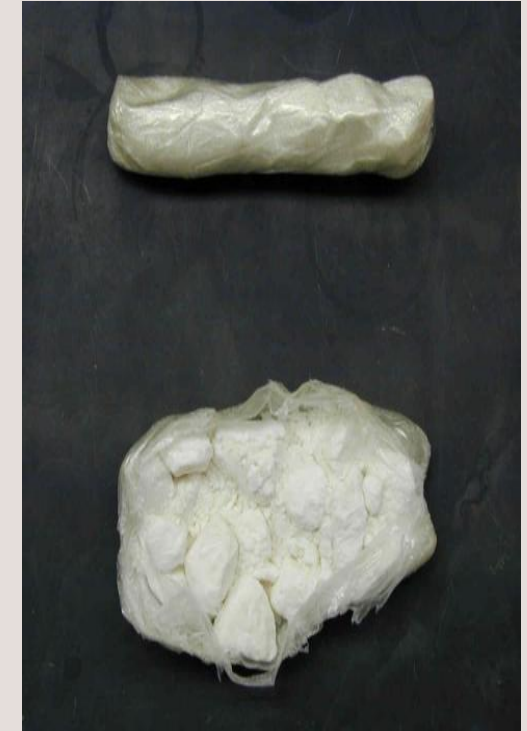
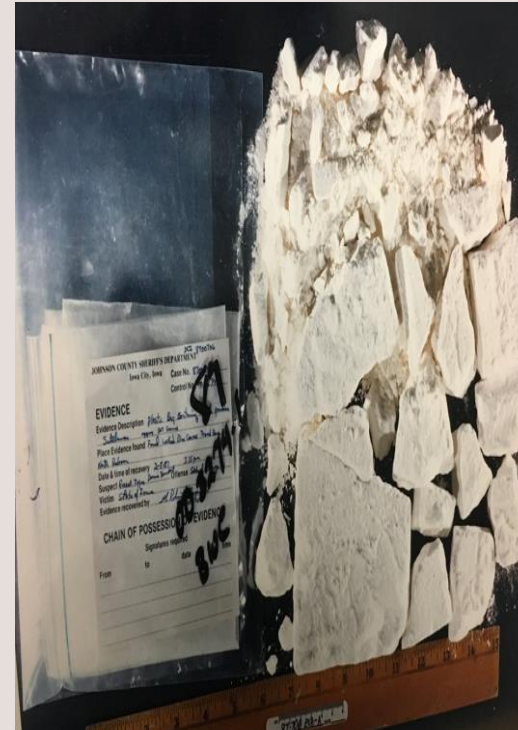
- Naturally occurring alkaloid
- Schedule II, medical use in ENT procedures
  - Topical agent used for anesthetic and vasoconstrictive properties
- Central nervous system stimulant
  - Increased euphoria, talkativeness, anxiety, agitation
  - Can cause tremors, sweating, muscle rigidity and delirium
- Two common forms - Cocaine HCl (salt) and Cocaine Base
  - Form determines how the drug is ingested, both forms act the same once in the body



**ALL OF THIS  
COCAINE  
IN THE WORLD  
& YOUR NOSE  
IS STILL IN MY  
BUSINESS**

# Cocaine HCl – Powder

- Salt form makes it water soluble
- Water solubility allows cocaine salt to be snorted and absorbed through the mucus membranes
- Salt form has high melting point – not conducive to smoking
- Slower and less powerful onset of effects when snorting vs smoking
- Can be dissolved and injected



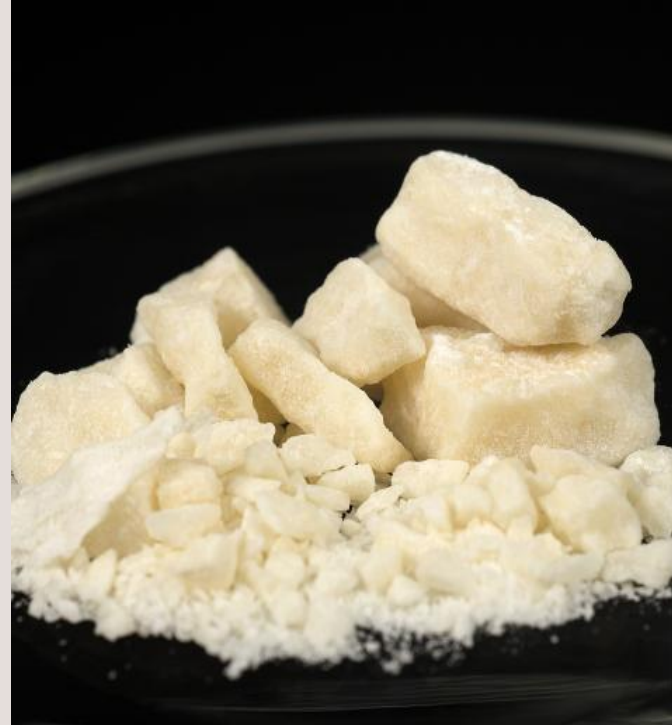


# Cocaine Base - Crack

- Base form is not water soluble, not conducive to snorting

- Base form has a much lower boiling point, allows for heating and vaporizing

- Can be dissolved in an acidifier (ascorbic acid/Vitamin C) and injected



# Cocaine Base

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-Produced by:

- Dissolving powder cocaine in a mixture of water and ammonia or baking soda
- Boil (or microwave) until a solid mixture forms
- Removing solid from liquid
- Allowing to dry
- Breaking apart into “rocks”

Typically packaged in small Ziploc bags or small tied corner baggies



# Cocaine Paraphernalia

## -Straight pipes

- Metal or glass
- Mesh screen or steel wool plug
- Blackening of heated end

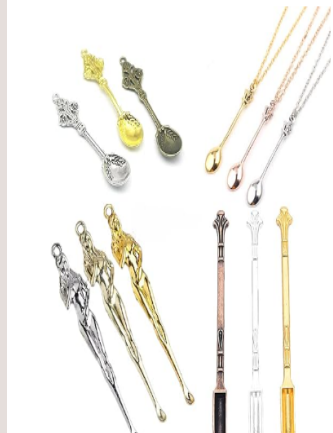


## -Straws, tubes, rolled up money or paper

## -Razor blades

## -Small mirrors and small spoons

## -Lighters



LHHT Snuff spoon, 12pcs Coke spoon, Spoon, Assorted (Gold, Silver, Bronze)

Visit the LHHT Store

3.5 ★★★★★ 3 ratings

-13% \$13.99

List Price: \$15.99

✓prime One-Day

FREE Returns

Coupon: ☐ Apply 15% coupon Shop items > | Terms

Get a \$150 Amazon Gift Card instantly with Prime

Material	Metal
Brand	LHHT



# Pipe Comparisons

Crack pipe



Meth pipe





# White Powder Caution

## Can you tell the difference?

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fentanyl



cocaine

# Acidified Cobalt Thiocyanate Color Test

## Most Commonly Used Field Test For White Powders

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Are you sure  
what drug  
you're handling  
if this is the field  
test you're  
relying on?



# Opioids - Heroin

- Highly addictive opiate produced from morphine
  - 2x more potent than morphine
- Can be seen as bricks, large chunks, powders and black tar
- Variations in appearance of powders – white, off-white, light tan, brown
- Popularity rose after crackdown on Oxycodone prescriptions, more powerful high
- Expensive – single use 1/10<sup>th</sup> gram \$20-\$60
- Heated and injected – spoon, cotton filter, tin foil, lighter, syringe
- Five year shift
  - Heroin and occasional mixes of heroin/fentanyl and/or fentanyl analogs
  - Increasing mixtures of heroin and fentanyl/analog, less common to see stand alone heroin
  - Shifting to more stand alone fentanyl than heroin or heroin/fentanyl mixtures



OPIOIDS		
	Range	Average
Heroin		
Kilogram	N/A	N/A
Ounce	\$1,700-\$2,000	\$1,875
Gram	\$100-\$200	\$135
1/2 Gram	\$60-\$150	\$111
1/10 Gram	\$20-\$60	\$40





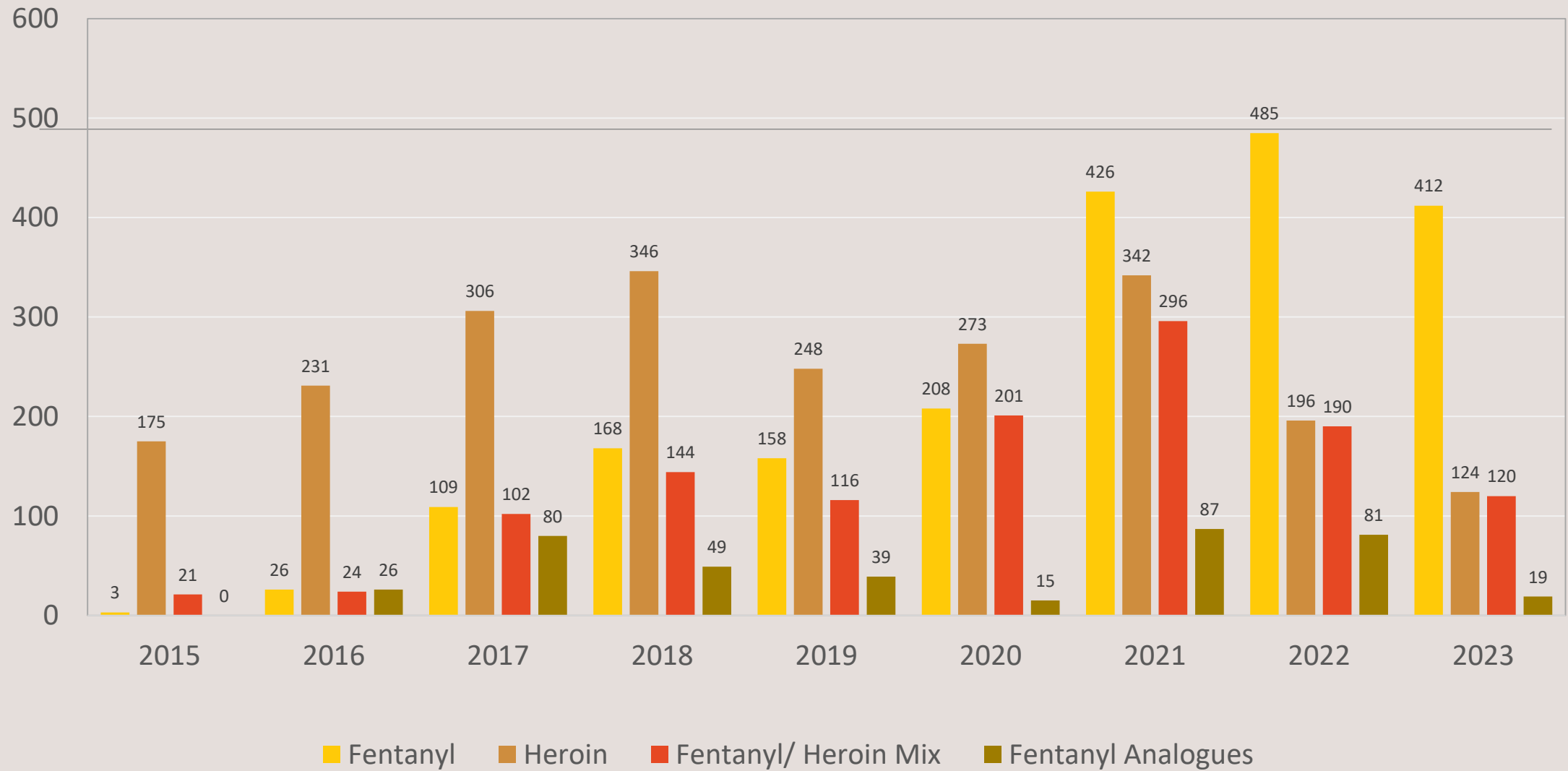
# Opioids - Fentanyl

- Pharmaceutical preparations - patch, lozenge, tablet, liquid IV and oral spray
- Illicitly manufactured in Mexico and China
- Up to 50x more potent than heroin
- Powder (typically white/off-white) and tablet forms most common
- Can be mixed with other drugs for desired effects (heroin, fentanyl analogs, cocaine, meth, benzodiazepines, tramadol, xylazine, nitazenes, caffeine, diphenhydramine)
- Cheaper and more powerful alternative as the user's dependency rises





## Number of Cases Submitted to DCI Lab Containing Fentanyl



\*2023 is preliminary and only includes data through September 30<sup>th</sup>

# Opioids – Counterfeit Fentanyl Tablets

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Colors can range from blue to blue/green to green, or white

Number of Counterfeit Tablets Found in Cases



\*2023 is preliminary and only includes data through September 30<sup>th</sup> 10 different types of counterfeit tablets seen to date, numerous combinations of drugs

# New Trend – Rainbow Fentanyl

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- Being used to target children and young adults

- Several cases submitted to DCI Lab that contained vibrant purple powder confirmed to be fentanyl

- One case analyzed in August 2023 containing 96 illicit tablets of various shapes and sizes, appeared to be a typical meth/MDMA preparation, not a pharma counterfeit – actually contained fentanyl

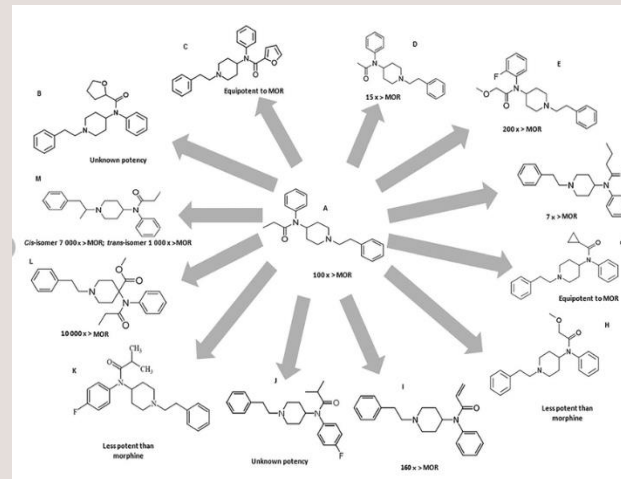
- Huge public health risk to young recreational users if they think they're taking meth/MDMA tablets



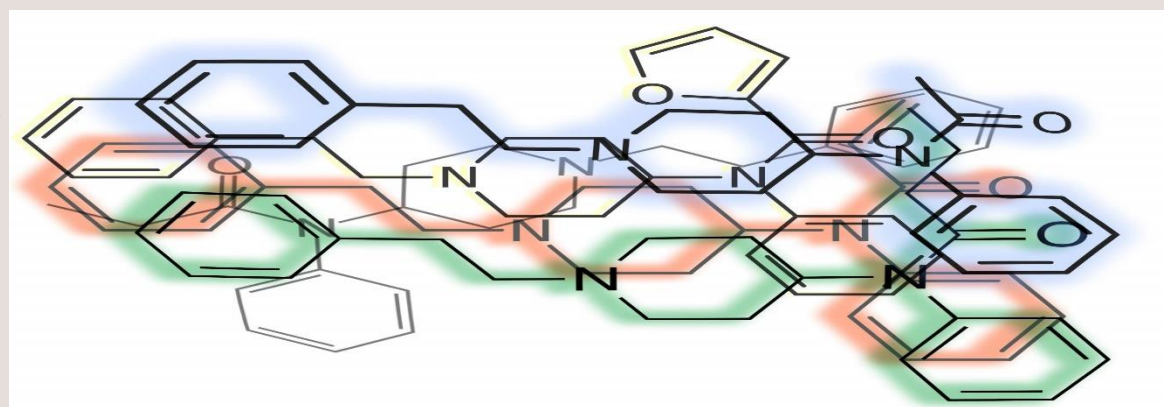


# Opioids – Fentanyl Analogs

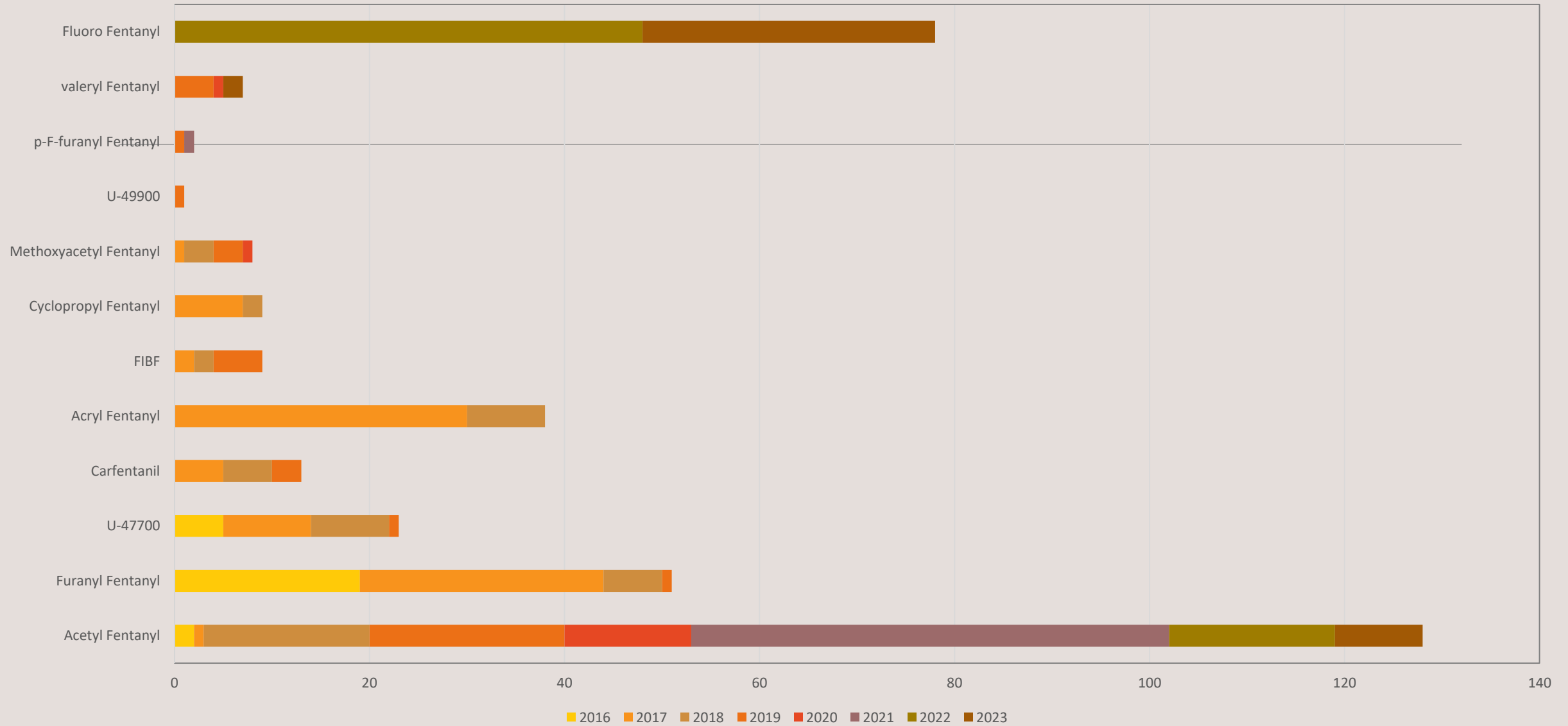
- Modifications to the fentanyl structure backbone
- Potential for over 1,000 different analogs
- Many analogs are much more potent than fentanyl
  - o Carfentanil 100x more potent than fentanyl
  - o Now we're up to 10,000x more potent than morphine
- 12 different compounds seen in Iowa cases
  - o Fluorofentanyl and acetyl fentanyl most common in 2023
- Heroin and Fentanyl mixture trend – moving away from numerous fentanyl analogs on to numerous nitazene compounds and xylazine
- Can make analysis/identification complex and challenging



## Lethal Dosage Amounts



## Cases Involving Fentanyl Analogues from 2016- 2023



\*2023 is preliminary and only includes data up to September 1<sup>st</sup>

# Novel Psychoactive Substances (NPS)

## -Nitazenes

- Synthetic opioids, some Schedule I
- Produced in China
- Linked to overdose deaths in several states
- Potency exceeds that of fentanyl
- Naloxone successful in reversing overdose but may need multiple doses

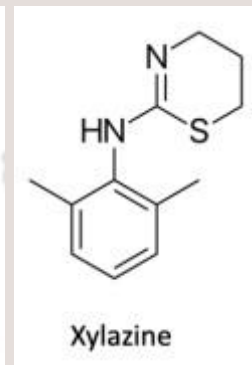
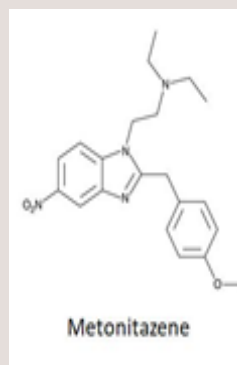
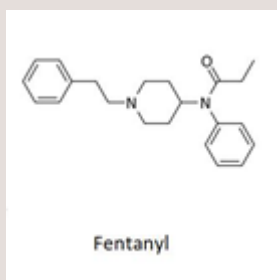
## Brorphine

- Synthetic opioid
- Schedule I
- Encountered as single compound or mixed with heroin/fentanyl
- Advertised as replacement for fentanyl

## Xylazine

- Animal tranquilizer
- Not an opioid – does not respond to Naloxone

-Structurally dissimilar to fentanyl but have same effects



## Things I learned in Organic Chemistry

- Interesting Reactions
- Nomenclature
- Deadly compounds
- How to draw hexagons



# NPS - Nitazenes

-Powder form – yellow, brown or off-white

-Pressed into counterfeit tablets

-Can be standalone, but typically mixed with heroin/fentanyl

-Up to 40x more potent than fentanyl, each compound varies

-8 compounds found in Iowa cases

- Isotonitazene, metonitazene, flunitazene, etodesnitazene, protonitazene, butonitazene, N-pyrrolidino etonitazene, N-pyrrolidino protonitazene

-Metonitazene most common in Iowa cases

[News](#) > Opioid 25x More Potent than Fentanyl Tied to 20 Overdose Deaths in U.S., UK

## Opioid 25x More Potent than Fentanyl Tied to 20 Overdose Deaths in U.S., UK

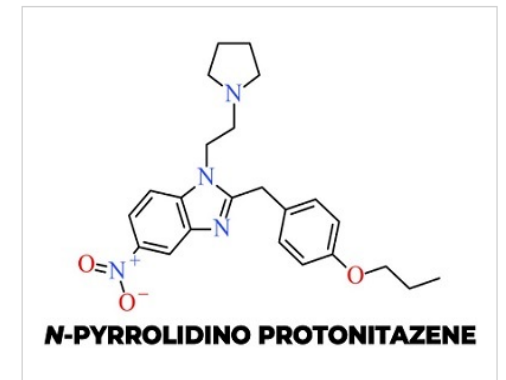
September 11, 2023 | Michelle Taylor Editor-in-Chief



From one end of the country to the other, officials are tracking yet another nitazene analogue that has caused at least 20 overdose deaths to date. Recently acquired *in vitro* pharmacological data shows this emergent novel synthetic opioid—called *N-pyrrolidino protonitazene* (also protonitazepyne)—is 25x more potent than fentanyl.

Nitazene analogues are a novel class of synthetic opioids that can be up to 40 times more potent than fentanyl and up to 500 times more potent than morphine. While they vary in potency, most retain opioid receptor activity.

In January, for example, the Center for Forensic Science Research & Education (CFSRE), identified *N-Desethyl isotonitazene* in samples from Pennsylvania and Florida. This nitazene analogue is up to 20x more potent than fentanyl. *N-desethyl* was first found in urine samples from a drug treatment program in Pennsylvania in September 2022. The synthetic opioid then quickly made its way south, showing up in counterfeit “A215” round blue tablets that were sold as oxycodone in Florida in November 2022.



In the analyzed samples, *N-Pyrrolidino protonitazene* was found in combination with:

- Additional novel psychoactive substances- 70%
- Quinine- 60%
- Other Nitazene analogues- 55%
- Methamphetamine/cocaine- 55%
- Fentanyl- 55%
- Xylazine (zombie drug)- 35%
- NPS benzodiazepines- 30%



# NPS - Xylazine

-“Zombie Drug” or “Tranq”

-Non-opioid sedative, analgesic and muscle relaxant – authorized for vet use only

-Currently non-controlled

-Linked to overdose cases across the US, assumed to be highly underreported in overdose statistics

-Typically found in combination with fentanyl/fentanyl analogs/heroin mixtures – powders and tablets

-DEA reported 1 kilogram of powder Xylazine can be purchased online from China for \$6-20

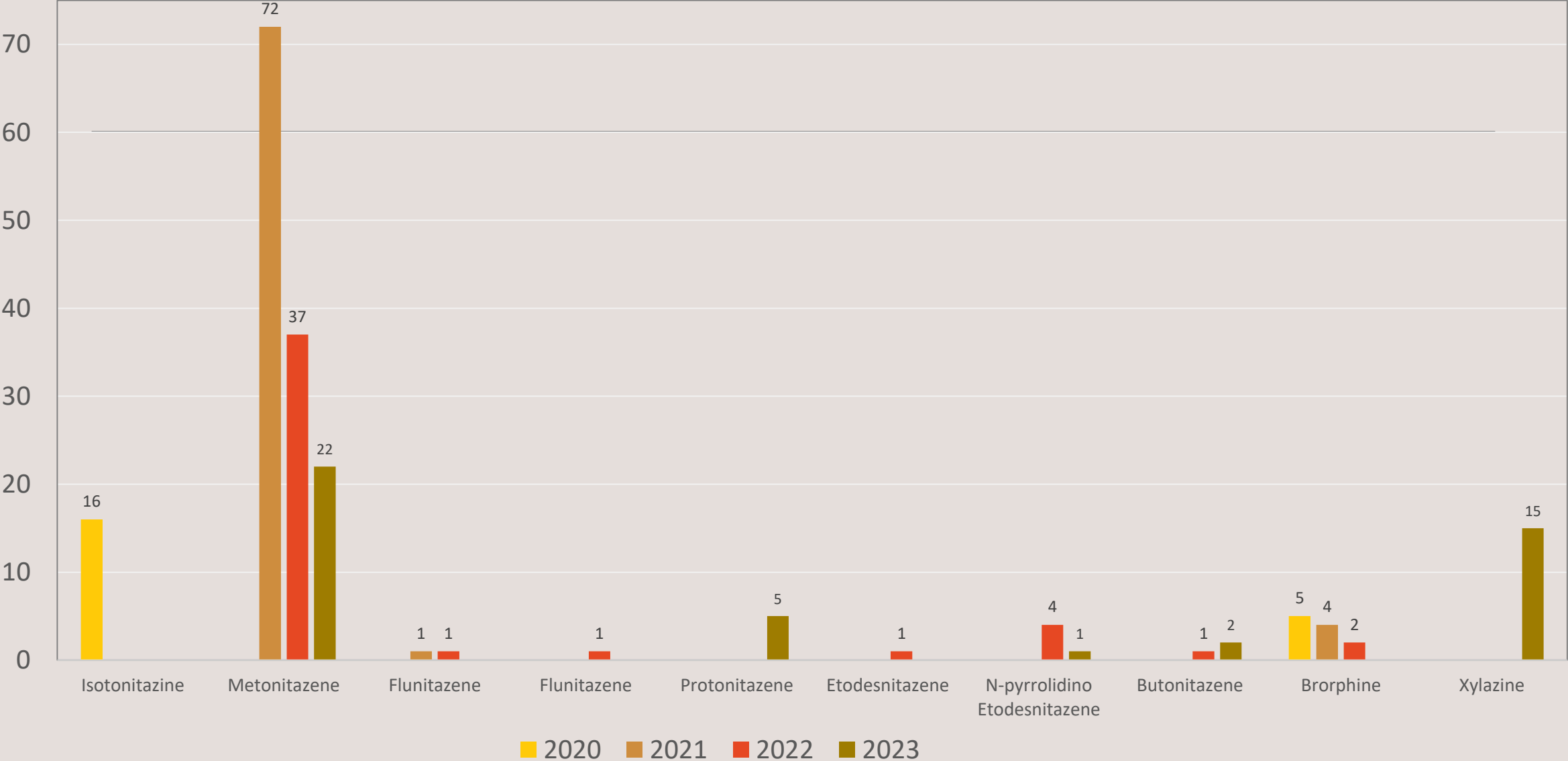
-Injecting xylazine – reports of soft tissue damage leading to tissue necrosis

-The more of these compounds you can add, the less heroin and/or fentanyl you need = higher profits

The Rapid Response Xylazine Test Strip is being distributed by Canada-based company BTNX following a study that found it had a 91% accuracy rate.



Number of Cases Involving NPS Submitted to DCI Lab



\*2023 is preliminary and only includes data through September 30<sup>th</sup>

# Heroin/Fentanyl Safety Concerns

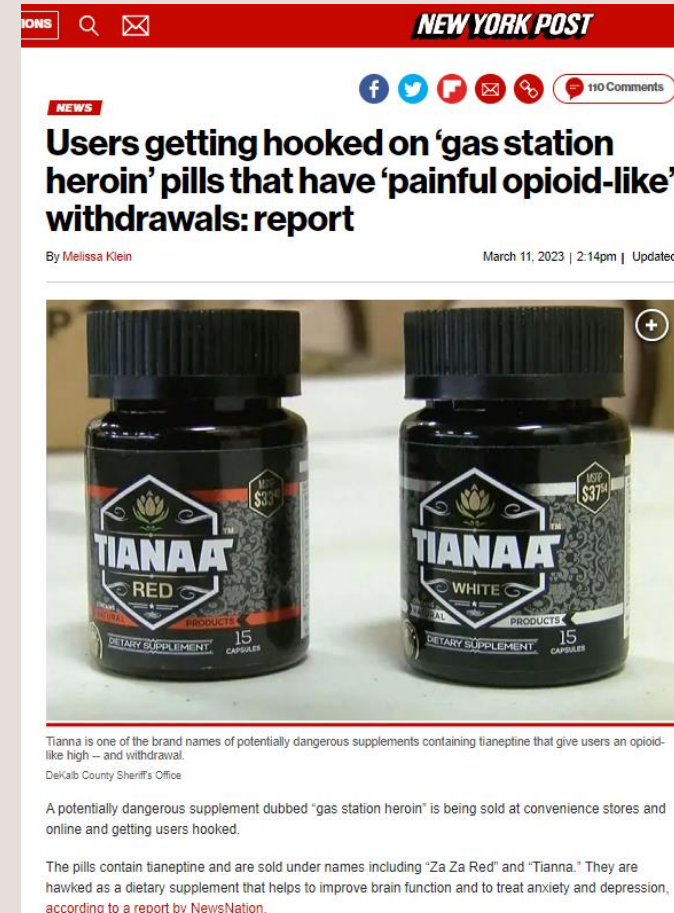
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- Can be absorbed through the skin
    - If any comes in contact with skin wash area immediately
    - DO NOT USE ALCOHOL – can increase absorption into the skin
  - Inhalation concerns when opening powders
    - Don't open any substances suspected to contain fentanyl unless necessary and safe to do so – fume hoods are a must
  - Carry NARCAN® and know how to use it
    - Iowa's Naloxone Access Law – Law Enforcement, Fire, EMS can get RX
- Fentanyl bricks
- Easily confused with cocaine bricks
- Counterfeit fentanyl tablets
- Oxycodone preparations and alprazolam bars are commonly counterfeit, don't assume it's a legitimate pharmaceutical and handle accordingly



# Tianeptine

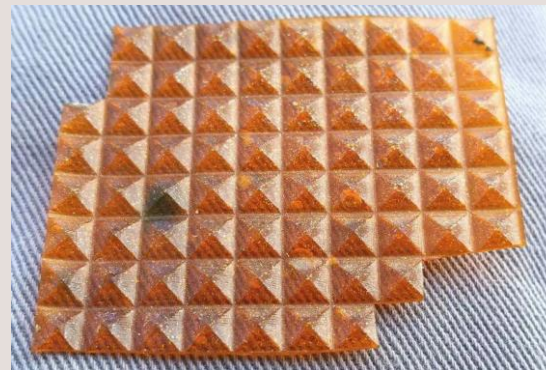
- Referred to as “Gas Station Heroin”, “ZaZa” or “Tiana”
- Tri-cyclic antidepressant
  - -European Rx 30-50mg/day
  - Illegitimate dosage 1.5-4grams/day
- Non-controlled – can be purchased online, in gas stations, convenience stores and smoke shops
- Opioid effects at high doses, addictive and causes severe withdrawal symptoms
- Linked to overdoses and overdose deaths nationally
- May be ingested, smoked or snorted
- Naloxone will reverse effects





# Hallucinogens - LSD

- Typically seen as blotter paper (can be perforated or not, may also be blank paper)
- May be seen on candies such as Sweet Tarts
- Also seen as gel tabs (hard, bumpy gelatin sheets)
- LSD is light sensitive, found wrapped in aluminum foil
- Liquid found in amber colored dropper bottles, possibly Visine bottles
- Dosage unit dissolved on tongue, will also absorb through skin – Always wear gloves!



# Psilocybin/Psilocin Mushrooms

- Hallucinogenic properties
- Investigative use for treatment of major depression, anxiety, alcohol use disorder, headaches and Parkinson's Disease
- Ingested, strong flavor – ground and placed in capsules, edibles, teas
- Legalized in Oregon, Colorado; decriminalized in certain cities in California, Massachusetts, Michigan



# Kratom (Mitragyna Speciosa)

- Tree-like plant from SE Asia
  - mitragynine - active compound, opioid effects
- Non-controlled - sold online, in gas stations, smoke shops, etc.
- Acts as a stimulant at low doses
- Acts as an opioid-like sedative at high doses
- Used to treat chronic pain or opioid withdrawal symptoms
- Risk of overdose at high doses
  - Respiratory depression, seizures, delusions and hallucinations
- Used as powder in beverages, in capsules or prepared as tea





# Laboratory Analysis of Pharmaceuticals

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Look up tablet/capsule markings in reference material

- If prescription/over-the-counter medication, tablet/capsule will not be analyzed further and will be reported as “consistent in appearance” with reference material
- Prescription/over-the-counter medications not necessary to submit to laboratory if pharmaceutical reference has already been used
- Drugs.com – great reference for id photos and tablet contents



acetaminophen



ibuprofen



cyclobenzaprine



gabapentin



# Counterfeit Synthetic Benzodiazepines

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- Purchased on the internet/Darknet
- Sedative and hypnotic effects
  - Drowsiness, impaired coordination, dizziness, confusion, depressed respiration
- Often combined with opioids, increased overdose risks
  - Injecting benzodiazepines often causes tissue damage
- Addictive, rapid tolerance – can lead to withdrawal symptoms
- Xanax bars are most commonly counterfeit
- Most common compounds – clonazepam and bromazepam
  - Numerous others – flubromazepam, flualprazolam, meclonazepam, etizolam, pyrazolam, deschloroetizolam, adinazolam, escitalopram, fluclosetizolam, flubromazepam and phenazolam
  - Many compounds emergency scheduled by DEA or fall under Analog Act – Schedule I
- Will find whole tablets, crushed tablets, residues in spoons/tin foil and syringe washings



### Alprazolam 2 mg (rectangular tablets)

- Counterfeit as clonazolam, bromazolam, flualprazolam, flubromazolam, etizolam, phenazepam, etc.

# Investigative Therapies

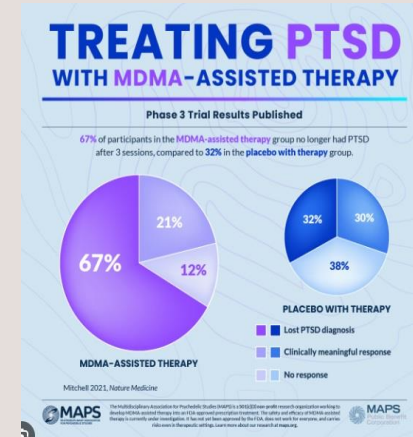
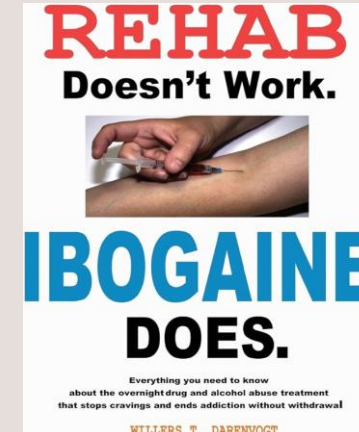
## -MDMA (Ecstasy)

- Empathogen effects – closeness, empathy, love
  - Decreased anxiety, release of oxytocin
  - Possible therapeutic benefits – Autism, PTSD
- -Ingested in tablet form or crystalline substance in capsules (Molly)

## Ketamine

- Used for anesthetic, pain control, agitation
- Potential treatment for depression
- Causes perceptual distortion, feeling of detachment, dissociation from surroundings and self
- Ingested, smoked, snorted, injected

-Psilocybin (synthetic form) and Ibogaine (plant from central Africa) psychiatric therapies



# Teen Trends

-More likely to use Rx and OTC drugs than most illicit drugs (Marijuana #1, RX #2, cough medicine #3)

-Internet challenges

- Tide Pod – record chewing, choking, gagging
- Benadryl – excess doses to get high/hallucinate
- Cinnamon – swallow 1Tbsp in 60 seconds – gagging, choking, coughing

-Abused OTC

- Hydroxyzine – euphoria, relaxation
- Dextromethorphan – Robo, skittles, poor man's PCP – dissociative hallucinogen
  - Coricidine Cough and Cold – triple C's
- SIZ-zurp – cough syrup + alcohol

-Inhalants – rapidly resembles alcohol intoxication, short lasting = continuous hits, can cause unconsciousness and cumulative toxicity



Types of Inhalants			
Liquids	Aerosols	Gases	Nitrites
Paint thinner Paint Remover Dry-Cleaning Fluids Gasoline Glues Correction Fluids, Felt-Tip Markers	Spray Paints Deodorant Hair Sprays Vegetable Oil Sprays Fabric Protector Spray	Chloroform Nitrous Oxide Whipped Cream Cans Butane Lighters Propane Tanks Refrigerants	Leather Cleaner Room Deodorizer Food Preservatives



# Evidence Collection/Preservation

---

## -Plant material

- If wet, allow to dry before packaging in paper

## -Powders, crystals, residues, etc.

- Leave substance in original packaging it was found in
- Package in appropriate sized bag/envelope
- If dry, place item into a zip lock bag so none of the sample can fall out of paper bag or envelope seams and corners

## -Liquids

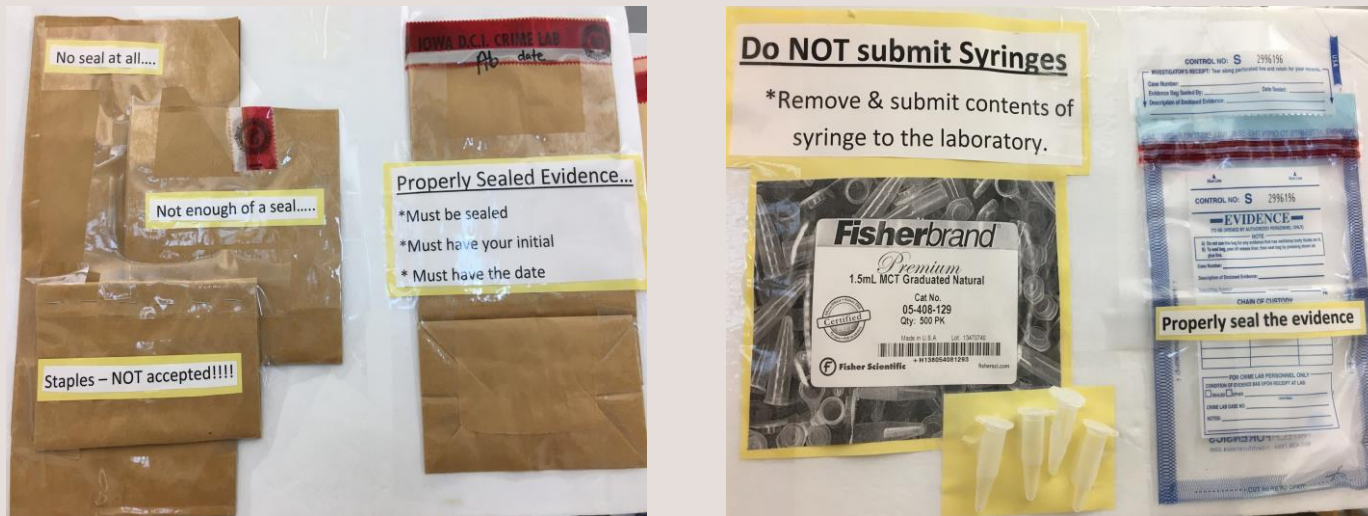
- Package in leak-proof container
- If the substance is basic or acidic, package it in a glass container
- Syringes are not accepted, rinse contents into flip-top vial for submission

-Items removed from body cavities should be allowed to dry before packaging and should be labeled as to where they were retrieved on evidence bag and submission paperwork (biohazard stickers)

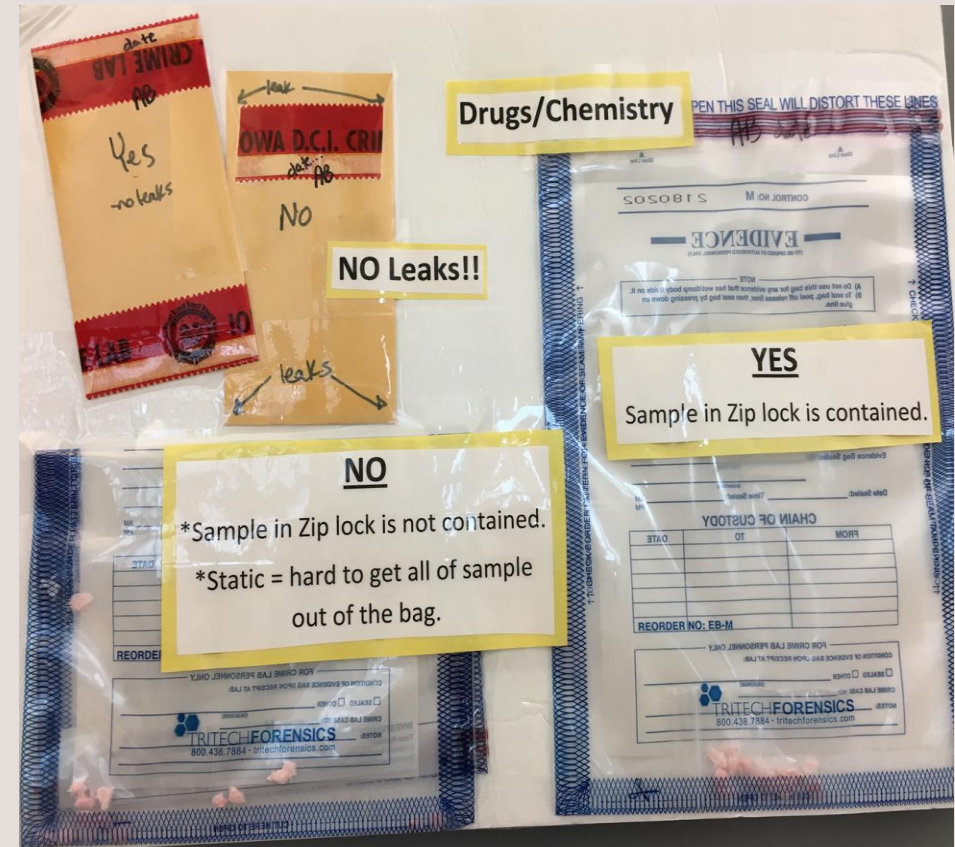
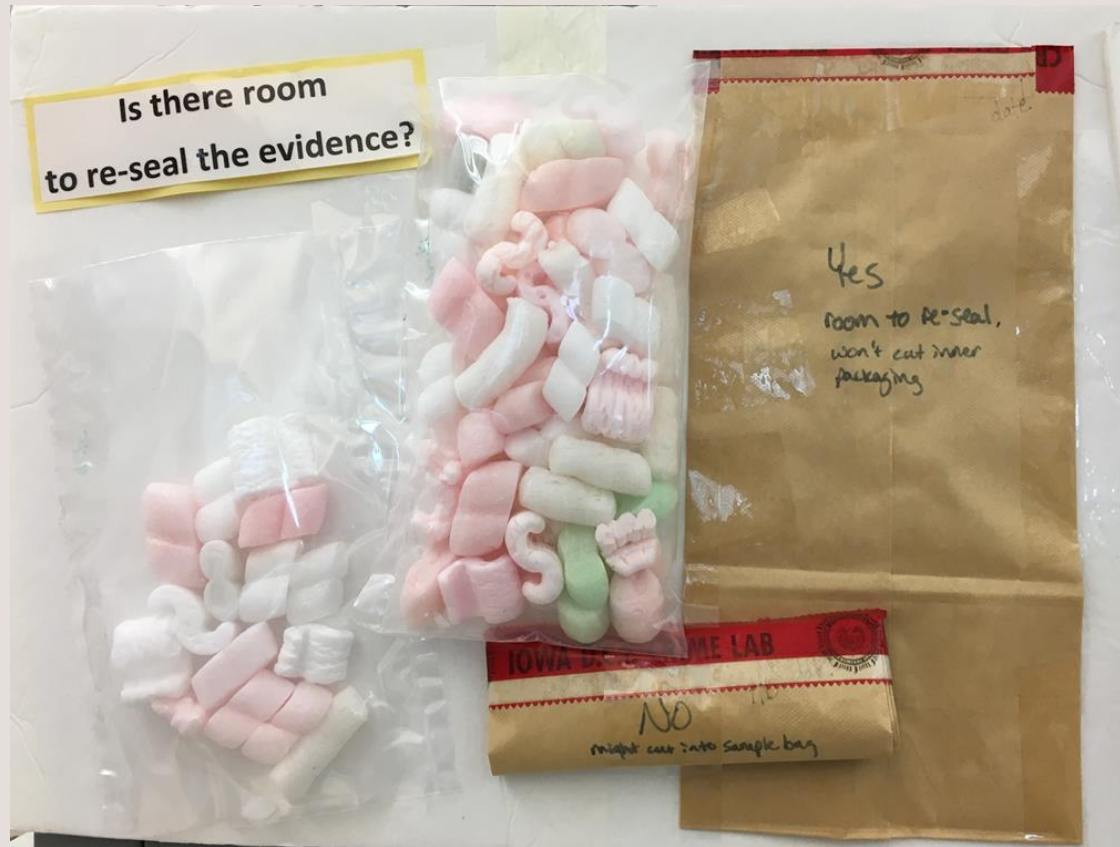
# Evidence Collection/Preservation (continued)

## Items submitted for latent prints

- Drug material MUST be separated from packaging BEFORE submitting to lab
- Exceptions:
  - Items consisting of tape/plastic wrapped bundles
  - Items containing residues (paraphernalia will not be tested for latent prints)
  - Suspected fentanyl/heroin if you do not have a safe place to separate drugs from packaging



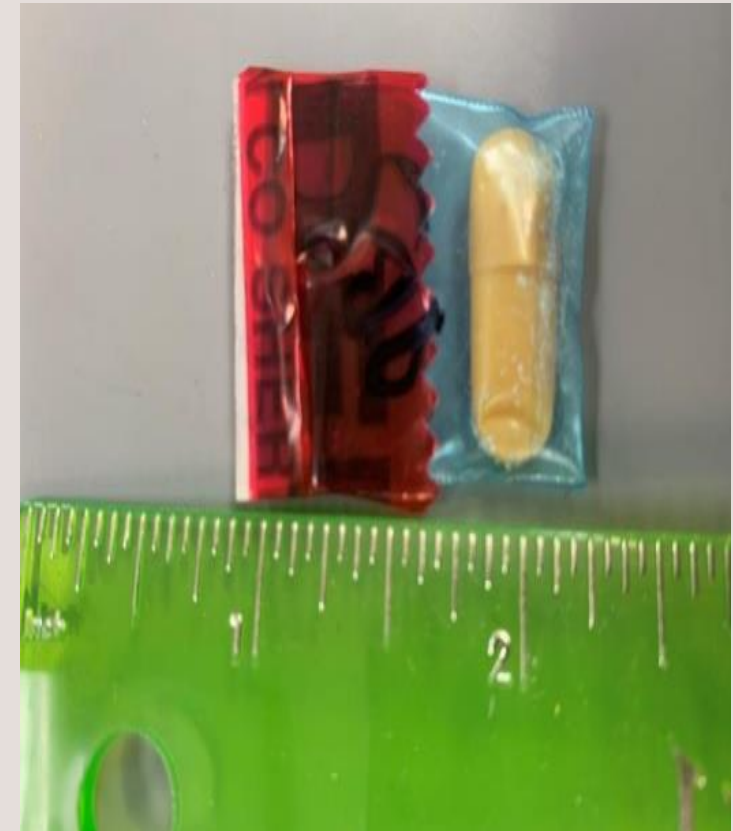
# Packaging





# Poorly Packaged Evidence

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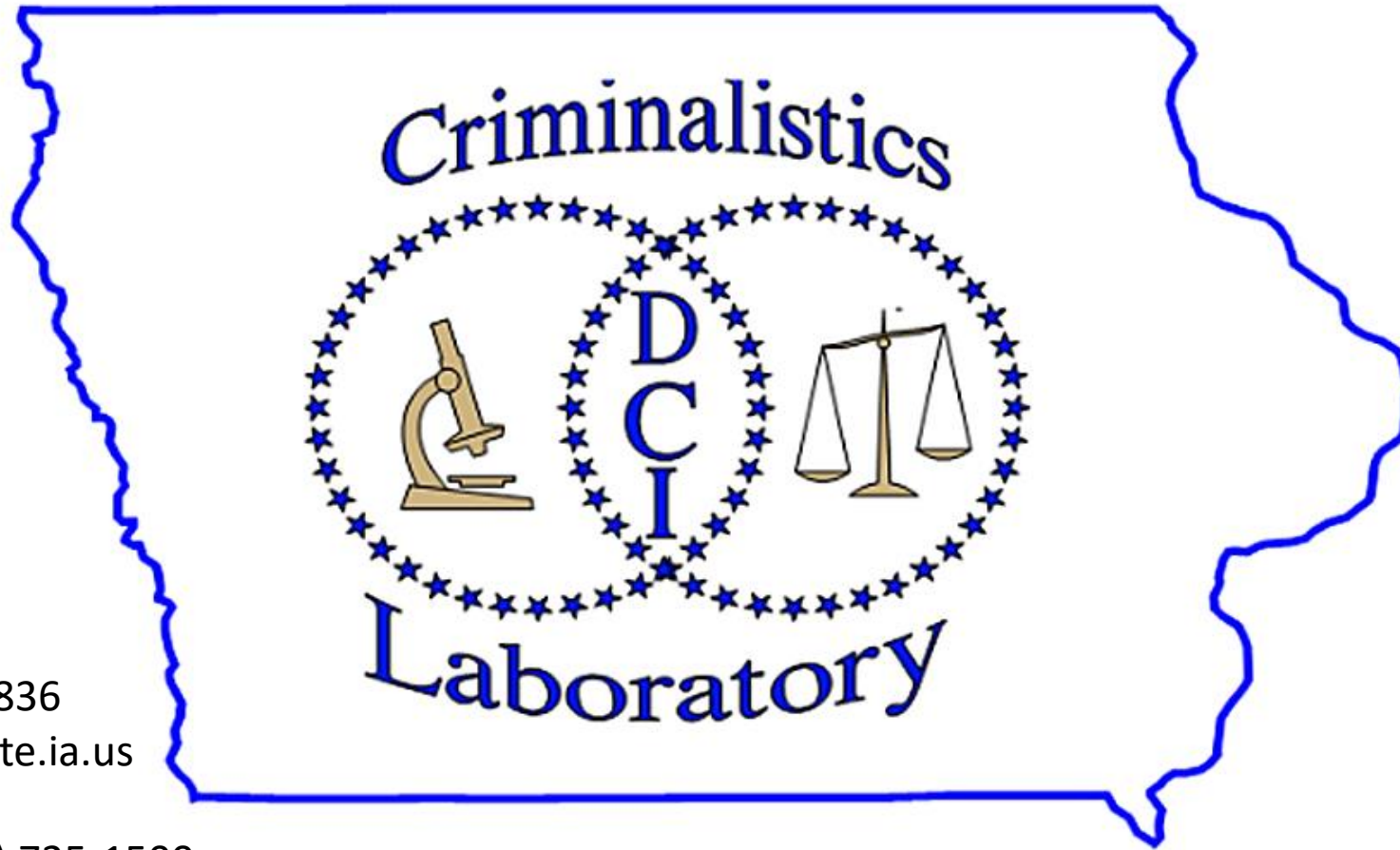


# Thanks

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- Linda Kalin - Iowa Poison Control Center
- Carley McConnell - Iowa DCI Crime Lab
- Jessie Whitmer - Iowa Division of Narcotics Enforcement
- Lee Leighter - Iowa Division of Narcotics Enforcement
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