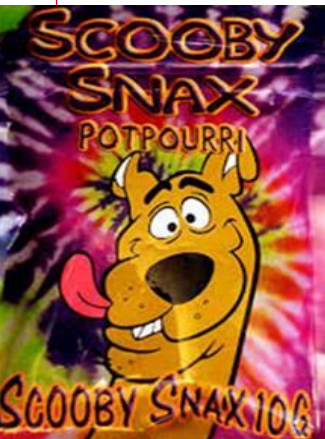


MACS

# Pink, Iso, Brororphine, Tranq, Smiles, Krokodil, Dragonfly, Trash Can, & Scooby Snax: The New Language of Drugs of “Abuse”



pink  
U4  
pinky  
u-47700

Christopher Welsh M.D.  
Associate Professor  
Department of Psychiatry

University of Maryland School of Medicine

## LEARNING OBJECTIVES

1. Participants will be able to name 3 new illicit drugs which are being used in the United States.
2. Participants will be able to name 3 adulterants that are being used as an adulterant /substitute for heroin.
3. Participants will be able to list 3 possible medical complications of adulterants.

# CONFLICT OF INTEREST

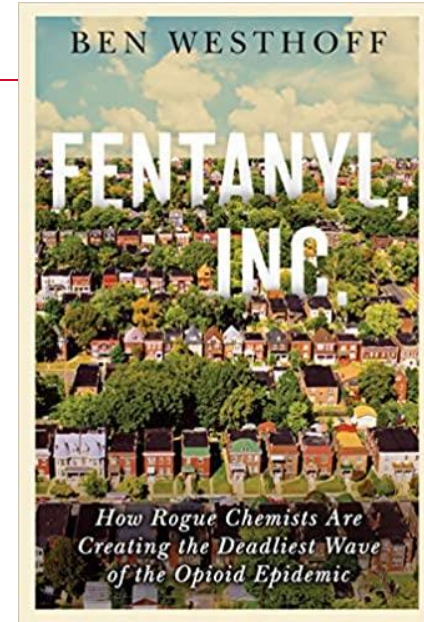
- I have received no money from the manufacturers of the drugs I will discuss.

## “DESIGNER DRUGS”

- “Novel Psychoactive Substances”, “NPS”, “Synthetics”, “Club Drugs”
- The term “Designer Drug” coined in 1988 by Henderson
  - to describe attempts to produce fentanyl analogues
- Used to describe any drug produced by making a slight change in the chemical structure of a controlled substance (CSA of 1970)
- These newer substances were “legal” until 1986
  - Controlled Substances Analogues Enforcement Act
  - makes any drug “substantially similar to” a schedule I or II drug illegal

# “DESIGNER DRUGS”

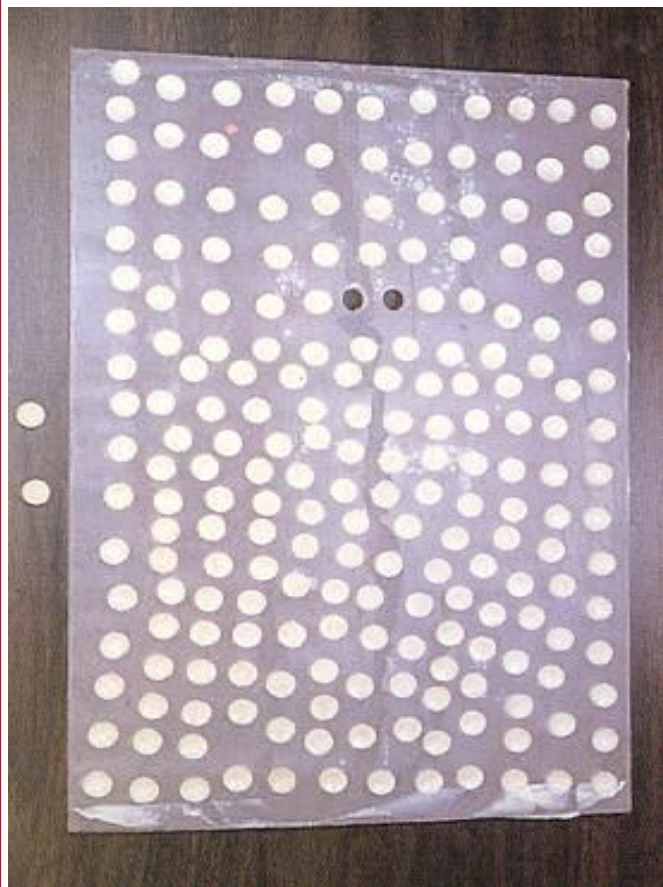
- Many are not truly new
- Many based on chemicals synthesized by chemists for legitimate reasons
- Some are marketed for legitimate medical reasons but are diverted for illicit use
- Others have never been used medically but synthesizing methods have been published and are easily obtained
- 100s of designer drugs have been made
  - only a handful have become popular
- In the past, was a relatively small problem compared to heroin, etc.





# MACS

---



# MACS





## Keith Richards: 'I Snorted My Father'

By Associated Press

TUE APR 3, 11:52 PM



Keith Richards appears in the press room of the ...

LONDON - Keith Richards has acknowledged consuming a raft of illegal substances in his time, but this may top them all. In comments published Tuesday, the 63-year-old Rolling Stones guitarist said he had snorted his father's ashes mixed with cocaine.

"The strangest thing I've tried to snort? My father. I

snorted my father," Richards was quoted as saying by British music magazine NME.

"He was cremated and I couldn't resist grinding him up with a little bit of blow. My dad wouldn't have cared," he said.

"... It went down pretty well, and I'm still alive."

# “DESIGNER” OPIOIDS

- Non-pharmaceutical fentanyls (NPFs)
- >30 different fentanyl analogues
  - alpha-methylfentanyl (**AMF**)
  - 3-methylfentanyl (**TMF**)
  - carfentanil
- Originally referred to as “China White” (the term reserved for very pure heroin), “Tango & Cash”, “Persian White”, “Goodfella”
  - “Gunpowder heroin”- newer term
- TMF & carfentanil 1000s of times more potent than morphine
- 1-methyl-4-phenyl-propionoxy-piperidine (MPPP) is the most well known meperidine analogue

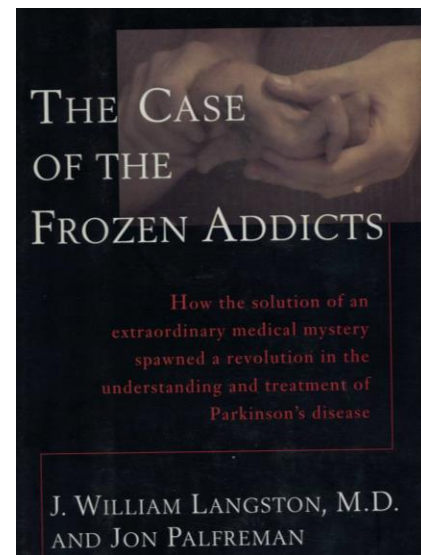
- 3-Methylbutyrfentanyl, 3-MBF
- 3-Methylfentanyl, 3-MF
- 4-Chloroisobutyrfentanyl, 4-ClIBF, p-ClIBF
- 4-Fluorobutyrfentanyl, 4-FBF, p-FBF
- 4-Fluoroisobutyrfentanyl, 4-FIBF, p-FIBF
- 4-Methoxybutyrfentanyl, 4-MeO-BF, p-MeO-BF
- 4-Fluorofentanyl, 4-FF, p-FF
- Acetylfentanyl, AF
- Acrylfentanyl
- AH-7921
- α-Methylfentanyl, "China White"

- Butyrfentanyl, BF
- Cyclopentylfentanyl, CP-F
- Desmethylprodine, MPPP
- Furanylfentanyl, Fu-F
- MT-45
- O-Desmethyltramadol
- Tetrahydrofuranylfentanyl, THF-F
- U-47700
- U-51754<sup>[62]</sup>
- Valerylfentanyl, VF



# MACS, “DESIGNER” OPIOIDS: HISTORY

- AMF appeared in late 1970s
  - 15 deaths in California in 1979-1980
  - made Schedule I of CSA in 1981
- TMF appeared in 1983
  - >100 deaths attributed to it through 1980s
  - spread to East Coast in late 1980s
  - 30 deaths in Baltimore in 1992
- MPPP tested as an analgesic in 1970s
  - appeared on the streets in mid 1970s
  - 1st MPTP induced Parkinson’s syndrome reported in ‘79



## CESAR *FAX* →

April 6, 1992  
Vol. 1 Issue 8

A Weekly FAX From the Center for Substance Abuse Research

University of Maryland At College Park \*

### *Demographic Characteristics of 23 Fentanyl Related Deaths in Maryland in 1992*

Two-thirds of Fentanyl related deaths in Maryland involved a black male or female and were over 30 years of age. Almost all of the incidents occurred in Baltimore City or Baltimore County in February or March. 550 envelopes containing Fentanyl have been seized by the state police. State police indicate the Fentanyl to be licitly manufactured rather than produced in clandestine labs. Heroin addicts should be alerted that drugs sold as heroin may contain Fentanyl ("China White").

#### Demographics of Maryland Fentanyl Incidents

RACE:	f	%	AGE:	f	%
-------	---	---	------	---	---



## STAY INFORMED

Sign up for news &amp; alerts



Already signed up?

[Login here](#)

## What Can I Do?



## Get Help

Need alcohol or drug help for  
yourself or someone else?[CLICK HERE >](#)

## Resources



Find useful

[Home](#) > [News](#) > [Headlines](#) > In the News

## East Coast Hit by Rash of Heroin Deaths, Overdoses

May 8, 2006

### News Summary

[Email](#) [Print](#) [Subscribe](#)

Heroin users from Chicago to Maryland have been killed or sent to the hospital by a powerful drug mix that includes the painkiller fentanyl, [USA Today](#) reported May 5.

More than two dozen deaths and 300 hospitalizations have been tied to use of the mixture during the past three weeks, according to state and federal officials. The heroin-fentanyl mix first appeared in Chicago on April 13, and has killed 11 people there and caused overdoses in 144 other users. Since then, the drug has surfaced in Camden, N.J.; Wilmington, Del.; [Salisbury, Md.](#); Harrisburg, Pa.; and a handful of other communities.

Experts say the heroin-fentanyl mix is unusual because the painkiller is expensive, whereas heroin is usually cut with cheap substances like sugar or flour to boost dealer profits. Typically, it is midlevel dealers in the U.S. who cut the drugs.

# MACS “HERONYL”/“FENTOIN”

Vancouver Coastal Health  
Preventing and Reducing Harm

VCH HIV/AIDS & Harm Reduction  
May 29, 2013

## Toxic Fentanyl sold as Heroin

Powder fentanyl can cause overdoses

Fentanyl overdoses can be harder to reverse

Try not to use alone  
Inject slowly  
Use Insite  
Carry Naloxone  
Call 911 right away if someone ODs

This is an official  
**CDC HEALTH ADVISORY**

Distributed via the CDC Health Alert Network  
June 20, 2013, 15:15 ET (3:15 PM ET)  
CDCNAN-00350

### Recommendations for Laboratory Testing for Acetyl Fentanyl and Patient Evaluation and Treatment for Overdose with Synthetic Opioids

**Summary:** Recently, a number of intravenous drug users have overdosed on a new, non-prescription injected synthetic opioid, acetyl fentanyl. Acetyl fentanyl is a fentanyl analog previously undocumented in illicit drug use that is up to five times more potent than heroin. CDC recommends increased vigilance by public health agencies, emergency departments, state laboratories, medical examiners, and coroners for patients with symptoms consistent with opioid overdose and laboratory results showing an enzyme-linked immunosorbent assay (ELISA) positive for fentanyl.

CDC also recommends that public health officials work with laboratories to carry out ELISA screens for fentanyl, and if the results of these screens are positive for fentanyl, conduct gas chromatography-mass spectrometry (GC/MS) confirmatory testing on specimens to confirm or rule out fentanyl and its analogs, including acetyl fentanyl.

#### Background:

Since March 6, 2013, 14 overdose deaths related to a novel, injected non-prescription synthetic opioid have occurred among intravenous drug users in Rhode Island. Ten of those deaths occurred in March. On May 30, 2013, Rhode Island Department of Health confirmed that the implicated synthetic opioid is acetyl fentanyl, a fentanyl analog previously undocumented in illicit drug use. Acetyl fentanyl is not available as a prescription drug in the U.S.

The age of the persons who died from an acetyl fentanyl overdose ranged from 19 – 57 years, and 10 of the decedents were male. The toxicology testing results for most of the decedents showed, in addition to acetyl fentanyl, varying mixtures of drugs, including cocaine, heroin (morphine), ethanol, and benzodiazepines. However, none of these additional substances were present in all decedents and none of these persons tested positive for fentanyl by GC/MS after testing positive for fentanyl by ELISA. Toxicology results for one decedent showed only acetyl fentanyl (by GC/MS) and no other substances. These deaths represent a significant increase in the number of illicit drug overdose deaths compared with the number of cases typically reported in one month in Rhode Island.

There have been unconfirmed reports from other states of increases in illicit opioid-related overdose events seen in emergency departments. Media stories have associated these events with “fentanyl-contaminated heroin” or, in some cases, to fentanyl alone. It is possible that these events are related to acetyl fentanyl, but confirmatory testing is needed. States other than Rhode Island have not informed CDC that they are testing for acetyl fentanyl.

#### Case definitions:

1. **Illicit opioid-related overdose:** A diagnosis by a physician of illicit opioid overdose.

Note: If a suspected illicit opioid overdose event results in death, jurisdictions often carry out drug screening. Some jurisdictions perform an ELISA that includes a screen for fentanyl, while others do not routinely screen for fentanyl. CDC recommends screening for fentanyl by ELISA to

**Montreal police warn: Dangerous new street drug 40 times stronger than heroin**  
Pills and sophisticated drug-making equipment were seized in seven raids last month  
Katherine Wilton / THE GAZETTE May 15, 2013



The Quebec Health Department and Montreal police are sounding the alarm about a dangerous new street drug that can be 40 times stronger than heroin.

Photograph by: . . . Montreal police

**MONTREAL** — Almost three weeks ago, two men walked into a UPS store in Lachine and told the clerk they wanted to send a microwave oven and a toaster to an address in Colorado. The men had been regular customers over the last few months and always shipped the same items to various addresses in the United States. On their last visit on April 25, Montreal police raided the store as the men were filling out an address coupon.

# CARFENTANIL

- Fentanyl analog
- Synthesized by Jansen Pharmaceuticals in 1974
- One of the most potent opioids known
- Used commercially as a large animal tranquilizer (*Wildnil*)
- On illicit opioid scene in N. America since 2015

To put this in perspective, wild African elephants—an animal that Carfentanil is used on—weigh between 5,000 and 14,000 lbs as reported by National Geographic, which is roughly 26 to 72 times the weight of your average adult male of 195.5 lbs.



Journal of Analytical Toxicology

ABOUT THIS JOURNAL CONTACT THIS JOURNAL SUBSCRIPTIONS

Oxford Journals > Science & Mathematics > Journal of Analytical Toxicology > Volume 36, Issu

Receive our latest  
Sign up for Journal of Analy

**Analysis of Clothing and Urine from Moscow Theatre Siege Casualties Reveals Carfentanil and Remifentanil Use**

James R. Riches, Robert W. Read, Robin M. Black, Nicholas J. Cooper and Christopher M. Timperley\*

\* Author Affiliations

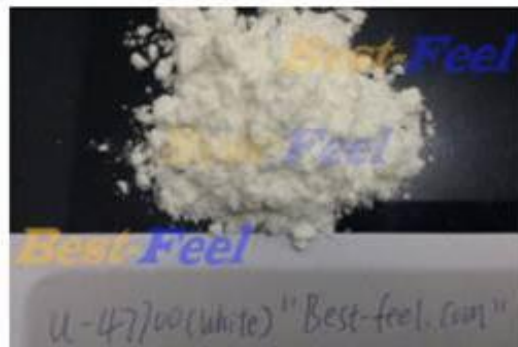
\* Author to whom correspondence should be addressed. E-mail: cmtimperley@dstl.gov.uk

Abstract

On October 26, 2002, Russian Special Forces deployed a chemical aerosol against Chechen terrorists to rescue hostages in the Dubrovka theatre. Its use confirmed Russian military interest in chemicals with effects on personnel and caused 125 deaths through a combination of the aerosol and inadequate medical care. This study provides evidence from liquid chromatography–tandem mass spectrometry analysis of extracts of

# “PINK”

- U-47700
- Synthesized by Upjohn in 1976
- “Pink”, “Pinky”; “U4”
- 7-10 Xs more potent than Morphine
- Never tested in humans. Relegated to research.



U-4770\*

★★★★★ 4.50 out of 5, (34) reviews

90.0% of buyers enjoyed this product!

**Price: ~~\$162.80~~ \$35.50**

**Save: 78% off**

- Shipping Weight: 1gram
- 1958 Units in Stock

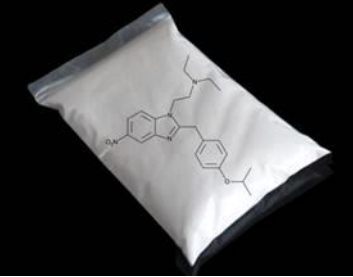
[Login to Shop](#)



## “ISO”

- Isotonitazene
- Similar to etonitazene (Schedule I)
- Slightly more potent than fentanyl
- Not currently scheduled
- Manufactured in China
- Appeared in U.S. summer, 2019
- More in Midwest but spreading

**Isotonitazene**  
A New and Potentially  
Deadly Synthetic Opioid



# BRORPHINE

- 1-(1-(1-(4-bromophenyl)ethyl)piperidin-4-yl)-1,3-dihydro-2 *H*-benzo[*d*]imidazol-2-one
- “Purple Heroin”
  - Often purple, grey or white
  - Typically mixed with other synthetic opioids
- Piperidine-based
  - Similar to fentanyl but not an “analogue”
- @ 100 X more potent than morphine
- Synthesis first reported 2018
- Reported in U.S., Canada, Sweden, Belgium
  - First reported in U.S. Summer, 2019
  - > 30 fatalities in: Illinois, Minnesota, Arizona, Louisiana
- DEA proposed Schedule I on 12/3/2020
- Potent [hERG](#) potassium ion channel inhibitor
  - May increase risk of Torsades



July 2020

## The Rise of Brorphine — A Potent New Synthetic Opioid Identified in the Midwestern United States

**Purpose:** The objective of this announcement is to notify public health and safety, law enforcement, first responders, clinicians, medical examiners and coroners, forensic and clinical laboratory personnel, and all other related communities about new information surrounding the emergent synthetic opioid **brorphine**.

**Background:** Synthetic opioids are chemically manufactured drugs, often accompanied with unknown potency and adverse effects or health risks. New synthetic opioids may be mixed with **more** traditional opioids, creating additional

## “TAR”

- “Mexican black tar heroin”
- “Cruder” form
- Historically seen int U.S. west of the Mississippi
- More across Midwest & Appalachia over past decade
  - In Virginia, West Virginia and western Pennsylvania
- Smoked or injected
  - “chasing the dragon”; “foiling”
    - leukoencephalopathy
    - botulism, etc



# KROKODIL

- Contains desomorphine
  - Synthesized in the U.S. in 1932
- Synthesized from codeine (OTC in some places)
- Increase in popularity in Siberia @ 2002
  - spreading to rest of Russia since 2010
- More reports in rest of Europe
- Few, but increasing, reports in U.S. since early 2000-teens
- More potent than heroin
- Shorter acting than heroin
- Associated with significant abscesses, etc
  - Likely due to impurities from manufacture (solvents, phosphorous, etc)



**The INDEPENDENT**

NEWS VOICES SPORT TECH LIFE PROPERTY ARTS & ENTS TRAVEL MONEY INDY

UK | World | Business | People | Science | Environment | Media | Technology | Education | Obituaries | Diary

News > World > Europe

## Krokodil: The drug that eats junkies

A home-made heroin substitute is having a horrific effect on thousands of Russia's drug addicts

SHAUN WALKER | WEDNESDAY 22 JUNE 2011

Send Recommend 40k Tweet 2,252 Share 34 476 PRINT EMAIL A A A

**Latest in News**

- Back up your doors and knock down the walls to fight the new bedroom tax
- The wasteland: Google Street View sends cameras into abandoned Fukushima town where 21,000 people once lived
- Internet speed hit by biggest cyber-attack in history
- BBC presenter Ben Fogle: The unwitting poster boy for eco-destruction
- Cyprus tries to stem tide of cash leaving the country after €10bn bailout
- Bits left ferry queasy after 30-hour trip that left them just six

**Related articles**

- The 12 most-read 2011 articles in News
- The Sketch: I Can't Believe It's Not Heroin!
- Heroin found in The National Archives



# KRATOM



- *Mitragyna speciosa*
  - a tropical tree in same family as the coffee tree
- AKA: “Thang”, “Biak Biak”, “Ketum”, “Kakuam”, “Thom”
  - “4x100”: M. speciosa leaves, coca cola, cough syrup (often w/codeine), ice
- Native to Southeast Asia
  - primarily used in Thailand, Malaysia, Indonesia
- Used by field workers for energy and relief from muscle strain
- Also used as opium substitute
  - Assist with symptoms of opioid withdrawal since 1800’s
- Fresh leaves chewed, dried leaves smoked or steeped in tea
- Increase in U.S., especially Pacific Northwest; S.F.
  - Widely available online and in “head”/smoke shops



# KRATOM



- Contains **mitragynine, mitraphylline, 7- $\alpha$ -hydroxymitragynine**
- Structurally similar to hallucinogens like psilocybin
- Psychostimulant effects at low doses
  - Increased alertness, physical energy, talkativeness
- Opioid receptor agonist at higher doses
  - High affinity for  $\kappa$ -opioid receptor
  - Pain relieving properties by partial agonist activity at  $\mu$ - and  $\delta$ -opioid receptors
- Effects occur within 20-30 minutes after ingestion
- Effects last 2-5 hours
- Acute side effects: nausea, itching, dry mouth, constipation, loss of appetite
- Psychosis and respiratory depression reported
- Withdrawal syndrome possible with chronic use
  - Irritability, muscle aches, rhinorrhea

# KRATOM



- Thailand: Narcotics Act B.E. 2522 classifies kratom with marijuana as Class V (1979)
- Malaysia: Poison Act 1951 (2003)
- United States: DEA “drug of concern”
  - DEA announced emergency scheduling of Kratom on August 11, 2016
  - Retracted under pressure from lobbyists and federal lawmakers
  - Open for public commenting through December 1, 2016; over 60,000 comments posted



# XYLAZINE

- A2 agonist
  - Clonidine analogue
  - Structural similarity to phenothiazines and tricyclic antidepressants
- FDA approved in U.S. as a sedative, analgesic, & muscle relaxant only for animals
  - dogs, cats, horses, elk, fallow deer, mule deer, sika deer, and white-tailed deer
  - Rompun, Anased, Sedazine, Xylamed and Chanazine
- Can see significant sedation, hypotension, bradycardia, hyperglycemia
  - Some reports of skin ulceration/abscesses (not consistent)
- Illicit use dating back to late 1970s
- Often from diverted veterinary supply
- Popular in Puerto Rico (“Anestesia de Caballo”) since early 2000s
- Increasing adulterant in heroin/fentanyl
- “Tranq Dope”, “Tranq”, “Sleep Cut”
- “Wipeout”- fentanyl + cocaine+ xylazine





# TIANEPTINE



- “Tiana”, “Tia”, “Zaza”
- Atypical antidepressant
  - Approved to treat depression and anxiety in Europe & Asia as Stablon, Coaxil
- Available in U.S. through DarkWeb
- Misuse in U.S. reported since @ 2000; Increase @ 2015
- $\mu$  opioid receptor agonist &  $\delta$  opioid receptor agonist
- Binds to serotonin transporter but appears to enhance reuptake
- Effects on NMDA Glutamate receptor
  - May increase synaptic plasticity (similar to Ketamine)
- Reports of deaths from respiratory suppression
  - + response to naloxone

# MACS “DESIGNER BENZOS”

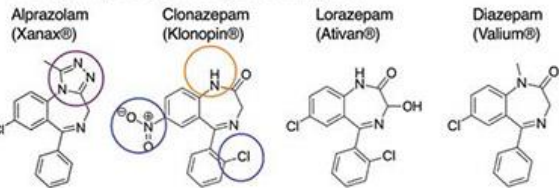


New benzodiazepines in Europe – a review

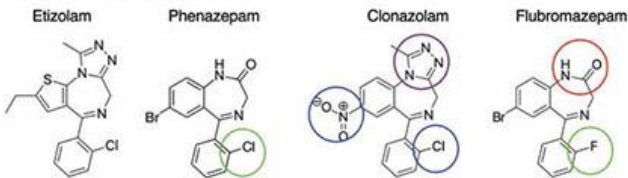
- Many not regulated
- Some available in other countries
  - Available in U.S. on-line
- Used in manufacture of “knock-off” benzos in U.S.

F1 Examples of benzodiazepines approved or not approved by FDA

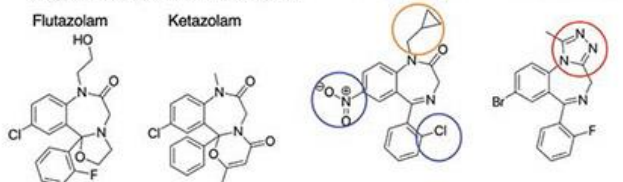
**Prescription (FDA-approved) Benzodiazepines**



**Non (FDA-approved) Benzodiazepines Approved in Other Countries**



**Atypical Designer Benzodiazepines**

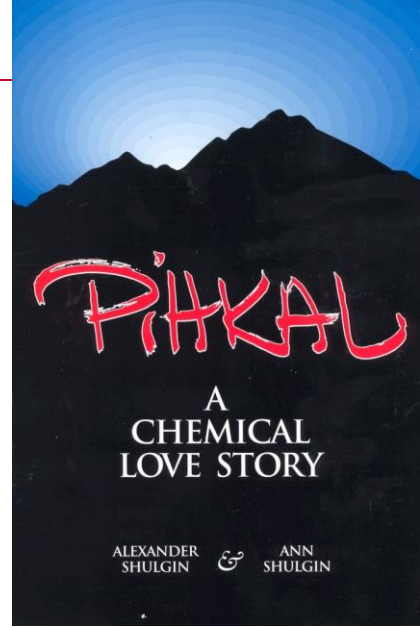


Timeline of benzodiazepines formally notified to the EU Early Warning System for the first time, 2007–2020



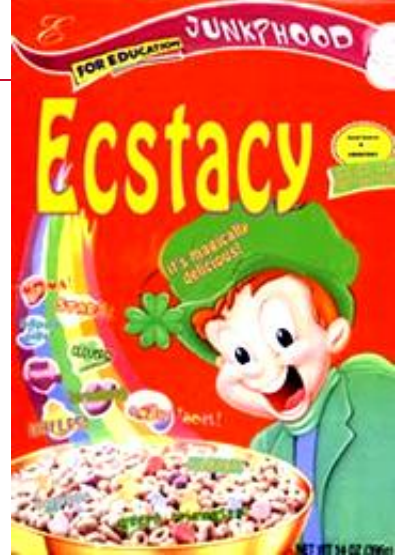
## “PSYCHEDELIC/ STIMULANTS”

- “methylated amphetamines”
- over 1000 have been synthesized
- chemically similar to mescaline & amphetamine
- have physiologic and psychological effects of stimulants and hallucinogens
- MDMA
- MDEA, MDA, STP(DOM), 2C-B(Nexus), Aminorex



# MDMA: HISTORY

- Synthesized by Merck in Germany in 1912
- ? as an appetite suppressant
- Some military research in the 1950s
- Not really used until the early 1970s
  - (after MDA was made schedule I)
- Used in the 1970s & 1980s by therapists to enhance psychotherapy
- Made Schedule I in 1985
- Use peaked in late 1990s-mid 2000s
- Resurgence @ 2012 as MOLLIE(Y)
- New research for PTSD, depression



# MACS

---



**FOX NEWS** .com  
Fair & Balanced

Listen to Fox News Radio Live

ON AIR NOW  
11a #mediabuzz  
WATCH LIVE

Home Video Politics U.S. Opinion Entertainment Tech Science Health Travel

**THE GREAT COURSES**  
NEW RELEASE!  
A New History of Life  
Taught by Stuart Sutherland

U.S. Home Crime Terrorism Economy Immigration Disasters Military Education Environment Pe

## Investigators say deaths in Boston, New York, and DC may be linked to 'Molly'

Published September 08, 2013 / FoxNews.com



**NBC NEWS INVESTIGATIONS**

Investigative reporting from NBC News, with your story ideas and documents. Share your ideas. Read about this blog. Follow us on Facebook and Twitter.

About this blog Archives E-mail updates Follow on Twitter Subscribe to RSS Like 18k

229 comments 6.2k Recommend 121 Tweet 1.2k Share

## Molly deaths may be caused by other drugs



## Electric Zoo music festival canceled after 2 deaths blamed on drugs

By Morgan Winsor, CNN  
Updated 8:17 AM ET, Tue September 3, 2013



### Promoted Stories

Woman Finds Out Her Husband Married Another Woman...

Prostitution is a choice, not a crime  
The Economist

Blue Cross expands benefits for end-of-life care

Do You Know the Signs of Dementia? 9 Surprising Facts



## 'Molly' Is Taking A Party Toll in the United States

Reuters | Posted: 09/28/2013 2:59 am EDT | Updated: 09/28/2013 9:28 am EDT

Recommend 237 people recommend this. Sign Up to see what your friends recommend.



## Wesleyan Students Hospitalized After Molly Overdose

By Jessie Sawyer and Ari Mason

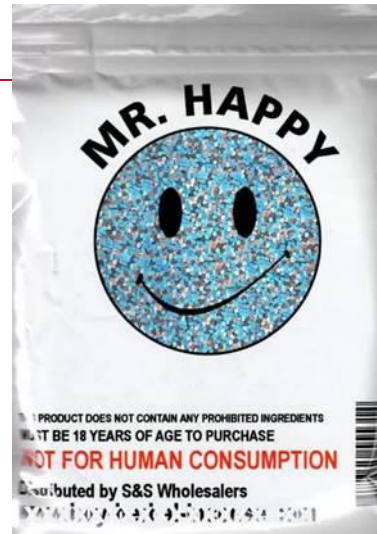
View Comments (25) | Email | Print | Tweet | Recommend | Send | G+ | 16



# SMILES



- 2C-I
- 2C class are phenethylamines
- Synthesized by Alexander Shulgin
- Used illicitly since the mid-1990s
- Available in Dutch shops in early 2000s.
- Usually in a powder; occasionally a tablet.
  - Some reports of mixing with chocolate.
- Typically snorted or swallowed.
- Effects last 4-12 hours
- DEA Schedule I



# N-BOMB

- 25-NBOMe
- AKA: “25I”, “25C”, GNOME”
- Similar to 2-C series
- Action at 5-HT 2A
- DEA Schedule I

engage / buzz  
**maskmatters.org**  
**THE NEW DRUG N-BOMB**

**A** new drug marketed as an alternative to LSD or mescaline has surfaced. Commonly known as the “N-bomb,” the drug has been mistaken for LSD, but is considered to be a powerful and potentially deadly synthetic drug. Other street names for the drug include Smiles, 25-I and 25INBOMe.

The N-bomb has raised concern among parents, law enforcement and federal officials because there is no way to determine what they are made of or how the body will react when taken. Vince Figarelli, superintendent of the Arizona Department of Public Safety’s crime lab, says that officials are having trouble dealing with synthetic drugs like the N-bomb because, “one of the problems with all these drugs is that we don’t know how they extract out of the blood and how to recover them.”

There have been several deaths related to the N-bomb in states including Arizona, North Dakota and Louisiana. In one incident,

a 19-year-old man spent four days in the hospital in an induced coma because doctors could not stop his seizures. A week later, the agitation and hallucinations resolved, but the man was still suffering from episodes of forgetfulness.

Because there have not been in-depth medical studies on the N-bomb, it’s been difficult for law enforcement to keep up with new developments in such street drugs on a day-to-day basis. The chemical makeup of the N-bomb is so simple, some suggest that a person with a basic knowledge of chemistry could reproduce it. This is the biggest problem that law enforcement faces: staying up to date on the constantly changing realm of synthetic drugs, identifying them, and spreading the word about the dangers they pose.

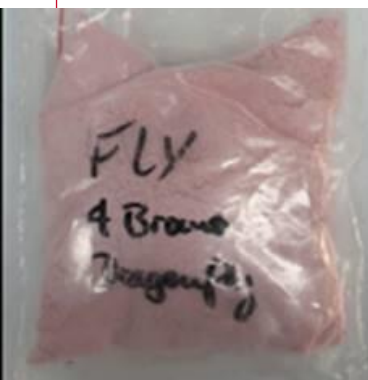
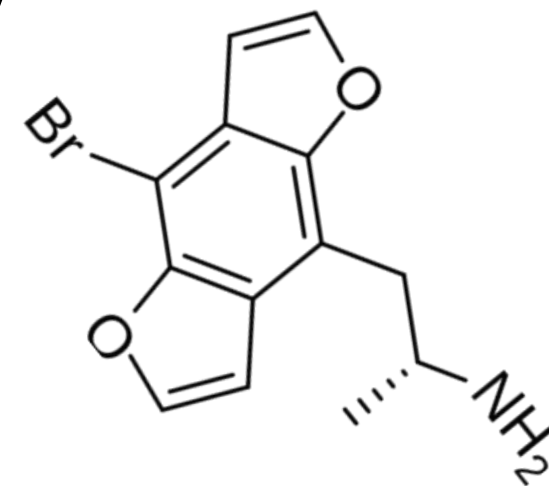
**PROUDLY SPONSORED BY CBI COMMUNITY BRIDGES, INC. Thank You**

2-(4-iodo-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethanamine  
 (25I-NBOMe) Grams      MG 51



# BROMO-DRAGONFLY

- 3C-Bromo-Dragonfly; “DOB-Dragonfly”; “Fly”
- Synthesized in 1998.
- Similar to phenethylamines.
- Acts at several serotonin receptor types.
- Very potent (1/5 that of LSD).
- Effects can last several days.
- May see vasoconstriction.
- Usually a powder or on blotter paper.
- Popular in Scandinavia but seen in U.S.
- Deaths reported from seizures & vomiting blood.
- Not DEA scheduled in the U.S.



A photograph of a blue product label for "Dragonfly". The label contains the following information:

PRODUCT NAME	Dragonfly
CHEM. NAME	1-(3-bromobenzyl)-2-(2,5-dimethoxyphenyl)propan-1-amine
CHEM. FORMULA	C <sub>13</sub> H <sub>12</sub> BrNO <sub>2</sub>
MOLECULAR MASS	294.15 g/mol
CONTENTS	solution

Small text at the bottom of the label reads: "FOR RESEARCH USE ONLY - NOT FOR HUMAN CONSUMPTION" and "WARNING: Contains 1 mg of 1,4-bis(4-methylphenyl)pyridinium salt".

# PIPERAZINES



- Original research in 1970s as antihelminthics
- Most popular benzylpiperazine (BZP)
  - Schedule I in 2002
- Trifluoromethylphenylpiperazine (TFMPP)
- 6-(2-aminopropyl)benzofuran (6-APB)
- Very popular in Australia and New Zealand
- “Cosmic Jet”, “Charge”, “Benzo Fury”, “Exotic Super Strong”, “XXX Strong as Hell”
- Stimulant effects at lower dose
- Hallucinogenic effects at higher dose
  - Effects serotonin reuptake, increases release & acts as agonist
- Typically snorted or taken orally
- Delayed onset of action (1-2 hours)
- Effects last 6-8 hours.
- Reports of seizures, QT prolongation, Serotonin Syndrome



# 5-MEO-DMT

- 5-methoxy-dimethyltryptamine
- Similar to DMT
- Found in several South American plants and in the venom of the *Bufo alvarius* toad
- Typically smoked, inhaled or injected
- Can be ingested orally with an MAO inhibitor
- Can be extracted from plants or synthesized
- About \$300 per gram through mail order

Venom of *Bufo alvarius*



# KETAMINE

- Similar to phencyclidine (PCP)
- Dissociative anesthetic
- Modulated NMDA receptor; some effects on NE, DA, 5-HT
- Special K, K, Jet, Super K, Vitamin K, Kit Kat, Cat Valiums
- First manufactured in 1965
- Misuse probably began in the late 1960s
- Much of what is misused is diverted from manufacturers and suppliers of medical & veterinary drug
- Comes in a liquid form or a white powder
  - Liquid often “cooked” in microwave to get powder
- Typically snorted; can be smoked or injected
- Onset typically 30 seconds to 30 minutes



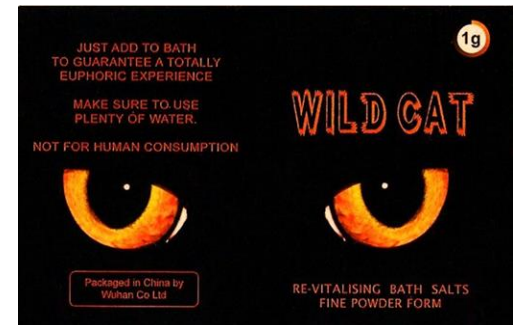
# METHOXETAMINE

- Synthetic analog of ketamine
- 3-MeO-PCE (also 3-MeO-PCP, 4-MeO-PCP)
- Aka: “MXE”; “M-Ket”; “Kmax”; “Mexxy”; “Roflcopter”
- First reported in Europe in 2010
- Typically a white powder
- Usually snorted; occasionally ingested
- Primarily inhibits NMDA; effect on DA & 5-HT reuptake
- Reportedly more intense than ketamine; less than PCP
- Onset in 5-10 minutes
- Duration 1-2 hours with some reports of much longer
- Unscheduled in U.S.
- Also methoxyketamine 2-MeO-ketamine



# SYNTHETIC STIMULANTS

- Many are Cathinones
- Often contain
  - methylenedioxypropylamphetamine (MDPV)
  - Mephedrone
- Similar to Methcathinone (Ephedrone)
- “Bath Salts”
  - Ivory Snow, Red Dove, Cloud Nine, Vanilla Sky, Ivory Wave, Lunar Wave, Bliss, White Lightning and Hurricane Charlie, Meow Meow, Bliss, Blast, Bloom, PeeVee, Meph
- First reported in U.S. around 2008
- \$20-\$80 per packet
- MDPV 10X more potent than cocaine w/ stimulant effects
- Typically snorted; occasionally injected
- Effects last 2-8 hours
- Reports of continued psychosis for weeks
- Blocks DA & NE reuptake similar to cocaine
- Not a transporter substrate



**EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF NATIONAL DRUG CONTROL POLICY**  
Washington, DC 20503

FOR IMMEDIATE RELEASE:

Tuesday, February 1, 2011

CONTACT:

ONDCP Public Affairs: 202-395-  
6618

[MediaInquiry@ondcp.eop.gov](mailto:MediaInquiry@ondcp.eop.gov)

## **Statement from White House Drug Policy Director on Synthetic Stimulants, a.k.a “Bath Salts”**

**Washington, D.C.** – Today, Gil Kerlikowske, Director of National Drug Control Policy, released the following statement following recent reports indicating the emerging threat of synthetic stimulants, including MDPV (3,4-methylenedioxypropylvalerone) and mephedrone. These stimulants are often sold and marketed in stores as “bath salts” under names such as “Ivory Wave” or “Purple Wave.”

## “FLAKKA”



- Based on Spanish slang for “skinny woman”
- AKA “Gravel”
- Alpha-PVP (pyrrolidinopentiophenone)
- Similar to MDPV
- Imported from China
- First reported in U.S. 2014
  - Primarily Florida, Texas, Mississippi, Alabama
  - Emerging in Mid West
- \$5 per packet
- White or pink powder
- Typically snorted; occasionally injected, eaten or smoked
- Similar to other potent stimulants- “Excited Delirium”
- Reports of continued psychosis for weeks





# EUTYLONE

- A Cathinone
- Synthesized in 1960s
- Illicit use beginning @2019
- “Replacing” methylone/ethylone
- Less potent than some others

# “TRASH CAN”



## Unidentified Dangerous Substance Distributed in “Trashcan” Containers Tied to ED Patients with Combative Behavior

Prepared By: Natalie Butler      Report Date: 09/18/2020  
 Information Type: Drug - General      Report ID: 1487

**Synopsis:**  
 Several patients in a Baltimore City hospital exhibited erratic and combative behavior after ingesting an unknown substance distributed in “trashcan” containers.

**Details:**  
 The Behavioral Health Administration of the Maryland Department of Health (BHA MDH) shared information about incidents on August 19, 2020 at the Emergency Department at Union Memorial Hospital in Baltimore, MD involving irregular, at times combative, patient behavior after ingesting an unidentified dangerous substance referred to as “Trash Can.” Patients presented with “excited delirium,” hallucinations, erratic behavior and were combative. Five or six patients were reported to have taken “Trash Can,” described as a clear capsule with a hinge that was being distributed in the area as free samples. Users reported to have opened the capsule and ingested or snorted the contents. All of the patients had hallucinations and were combative requiring massive doses of sedatives. Some patients reported that they have used what they thought to be a synthetic drug.

- Patient 1: 39 years old, male; discharged after five hours, required Haldol and 6 mg Ativan.
- Patient 2: 52 years old, male; was admitted “out of it.” Required Benadryl, Haldol PO and IM, midazolam IV and IM x 2. No tachycardia (heart rhythm disorder) or hypertension (high blood pressure); was writhing at times.
- Patient 3: female, age unknown; was admitted for at least nine hours, combative, was given Naloxone by EMS due to shallow breathing, has history of substance abuse, was given Haldol 7.5 mg total + 2 mg Ativan, had to be restrained and woke up with no memory of the incident.
- Patient 4: 53 years old, female; admitted for 3 hours, vitals were stable, was given Haldol, Benadryl, Ativan, and IV fluids.

- Plastic containers with hinged lid
- Cylinder or cone
- 1<sup>st</sup> seen in Maryland in 2019
  - Found in northeast, eastern shore, southern, western Maryland & Baltimore City
- Found to contain:
  - Heroin
  - Fentanyl
  - Cocaine
  - Xylazine
  - Eutylone



Suspected drug was reported to be a synthetic cannabinoid or cathinone; however these drugs often cause tachycardia or high blood pressure.

Secondary suspected drug: PCP or similar drugs. Additional comments from the MDH point to an uptick in PCP-related visits at the UM Capital Region Medical Center in Prince George’s County, MD.

No specific treatment was recommended.

**Analyst Note:**  
 The “trashcan” drug packaging type has made appearance in several counties in Maryland throughout 2019-2020 containing a variety of drugs. In 2019, the Heroin Coordinator Intelligence Sharing Network reported seizures of plastic “trashcan” containers with suspected heroin in southern Maryland and in the Eastern Shore region. During 2020, several locations reported seizures of green, fluorescent yellow, pink, blue, clear, and orange containers with a hinged lid. In the north-east part of Maryland, seized “trashcans” contained suspected heroin, crack cocaine, and possibly a mixture of fentanyl and tranquilizer Xylazine, often referred to as “Tranq.” Most recent seizures revealed “trashcans” with substance that tested positive for Eutylone, also known as “bath salts.” Several drug samples submitted to the Maryland State Police Forensic Sciences Division during 2020 in similar containers tested positive for Eutylone. The Carroll County Health Department reported a patient with a history of multiple overdose incidents, who exhibited behavior similar to the symptoms reported in the Union Memorial hospital. The substance has not been confirmed.

Image 1: “Trashcan” Drug Packaging Type Seized in Maryland in 2019 – 2020.



MACS

# METHAMPHETAMINE

- “Meth”, “Crystal”, “Speed”
- Seeing more in Maryland
  - especially west, eastern shore, southern and northeast



# MACS SYNTHETIC CANNABINOIDS

- Cyclohexphenols (non-classical) developed in mid 1980s
- First “classical” synthesized in Israel (Hebrew University) in 1988 (HU-210)
- John W. Huffman created first ones in the mid 1990s (JWH-018; JWH-250)
- Methods for synthesizing were published in scientific literature, & thus available to all
- Appeared in Europe’s underground drug market in 2004, then in the U.S. around 2006
- Sprayed onto herbs (bay bean, blue lotus, etc)
- Marketed as incense or aromatic potpourri
- Most commonly smoked (joint, bowl or bong)



# MACS SYNTHETIC CANNABINOIDS

- Variable similarity in function to THC
- Full Agonist at CB1 & CB2 receptors (THC is a partial agonist)
  - Aminoalkylindoles, Cyclohexylphenols, Dibenzopyrans
  - Bind CB1 50-30X greater than THC
- Metabolites are also active
- Faster onset
- Lack cannabidiol (CBD; may blunt some of the adverse actions of THC)
- Likely higher risk of causing psychosis
- Seizures and other medical complications not seen with marijuana

Schedules of Controlled Substances:

## Temporary Placement of Five Synthetic Cannabinoids Into Schedule I Notice of Intent

by Drug Enforcement Administration, U.S. Department of Justice

v1.0 - Nov 24, 2010

from the Federal Register: November 24, 2010 (Volume 75, Number 226), pp 71635-71638

The following DEA notice is a notice of *intent* to emergency schedule five synthetic cannabinoid receptor agonists. It does not become final, and the substances are NOT placed in Schedule I, until a mandatory 30-day comment period has elapsed and a final notice has been published in the Federal Register.

[Federal Register: November 24, 2010 (Volume 75, Number 226)]

[Proposed Rules]

[Page 71635-71638]

From the Federal Register Online via GPO Access [wais.access.gpo.gov]

[DOCID:fr24no10-45]

JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol

### Synthetic Drug Abuse Prevention Act of 2012

Posted: July 18th, 2012



From the July 10, 2012 ONDCP announcement...

Dear Friends:

Yesterday, President Obama signed the Synthetic Drug Abuse Prevention Act of 2012 into law as part of S. 3187, the Food and Drug Administration Safety and Innovation Act. This important piece of legislation provides a critical boost to our nation's efforts to address the threat of synthetic drugs. The legislation bans synthetic compounds commonly found in synthetic marijuana ("K2" or "Spice"), synthetic stimulants ("Bath Salts"), and hallucinogens, by placing them under Schedule I of the Controlled Substances Act.

Although this Federal ban provides a valuable tool in keeping these dangerous substances off the shelves, we would encourage states that have not already done so to incorporate these substances into their state drug schedules to ensure that state law enforcement agencies have full authority to act against these substances. The Drug Enforcement Administration will continue to work with state and local authorities to investigate major distribution networks, but retail and community-level enforcement will continue to occur largely on a state and local level.

We expect that this law will have an impact on illicit sales of these newly scheduled synthetic drugs, at least in the short term. However, Federal and state agencies will have to continue to update the list of banned substances as new synthetic compounds emerge. In addition, some states and localities have also experienced success in using additional health, safety, or agricultural authorities to remove these substances from retail shelves.

Research shows that preventing drug use before it begins is a cost-effective, common-sense approach to promoting safe and healthy communities. In the coming weeks, ONDCP will be unveiling a *Synthetic Drug Prevention Toolkit*, which we hope will serve as a resource for communities dealing with this issue.

ONDCP is committed to partnering with our state, local, and community partners in addressing this challenge. As always, we are eager to hear from you on what you are seeing in your community and what is working in your own efforts.

Sincerely,

R. Gil Kerlikowski

## S. 605 Dangerous Synthetic Drug Control Act of 2011



Sponsor  
Charles Grassley

CoSponsors

Bill Status Placed on Senate Legislative Calendar under General Orders. Calendar No. 122.

Summary Full Text Bill Activity Analysis (1) Comments (0)

7/29/2011--Reported to Senate without amendment. (There is 1 other summary)

(This measure has not been amended since it was introduced. The summary of that version is repeated here.)

Dangerous Synthetic Drug Control Act of 2011 or David Mitchell Rozga Act - Amends the Controlled Substances Act to add as a schedule I controlled substance any material, compound, mixture, or preparation which contains specified cannabimimetic agents (or the salts, isomers, or salts of isomers thereof).

Extends the period during which the Attorney General may temporarily schedule a substance in schedule I to avoid an imminent hazard to public safety to two years with a one-year extension (currently, one year with a six-month extension).

## S. 3187 (112th): Food and Drug Administration Safety and Innovation Act

### Subtitle D—Synthetic Drugs

#### SEC. 1151. SHORT TITLE.

This subtitle may be cited as the "Synthetic Drug Abuse Prevention Act of 2012".

#### SEC. 1152. ADDITION OF SYNTHETIC DRUGS TO SCHEDULE I OF THE CONTROLLED SUBSTANCES ACT.

(a) CANNABIMIMETIC AGENTS.—Schedule I, as set forth in section 202(c) of the Controlled Substances Act (21 U.S.C. 812(c)) is amended by adding at the end the following:

"(d)(1) Unless specifically exempted or unless listed in another schedule, any material, compound, mixture, or preparation which contains any quantity of cannabimimetic agents, or which contains their salts, isomers, and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible within the specific chemical designation.

"(2) In paragraph (1):

"(A) The term 'cannabimimetic agents' means any substance that is a cannabinoid receptor type 1 (CB1 receptor) agonist as demonstrated by binding studies and functional assays within any of the following structural classes:

"(i) 2-(3-hydroxycyclohexyl)phenol with substitution at the 5-position of the phenolic ring by alkyl or alkenyl, whether or not substituted on the cyclohexyl ring to any extent.

"(ii) 3-(1-naphthoyl)indole or 3-(1-naphthylmethane)indole by substitution at the nitrogen atom of the indole ring, whether or not further substituted on the indole ring to any extent, whether or not substituted on the naphthoyl or naphthyl ring to any extent.

"(iii) 3-(1-naphthoyl)pyrrole by substitution at the nitrogen atom of the pyrrole ring, whether or not further substituted in the pyrrole ring to any extent, whether or not substituted on the naphthoyl ring to any extent.

"(iv) 1-(1-naphthylmethylene)indene by substitution of the 3-position of the indene ring, whether or not further substituted in the indene ring to any extent, whether or not substituted on the naphthyl ring to any extent.

"(v) 3-phenylacetylindole or 3-benzoylindole by substitution at the nitrogen atom of the indole ring, whether or not further substituted in the indole ring to any extent, whether or not substituted on the phenyl ring to any extent.

"(B) Such term includes—

"(i) 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (CP-47,497);

"(ii) 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (cannabicyclohexanol) or CP-47,497 C8-homolog;

"(iii) 1-pentyl-3-(1-naphthoyl)indole (JWH-018 and AM678);

"(iv) 1-butyl-3-(1-naphthoyl)indole (JWH-073);

"(v) 1-hexyl-3-(1-naphthoyl)indole (JWH-019);

"(vi) 1-[3-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole (JWH-200);

"(vii) 1-pentyl-3-(2-methoxyphenylacetyl)indole (JWH-250);

"(viii) 1-pentyl-3-[1-(4-methoxynaphthoyl)]indole (JWH-081);

"(ix) 1-pentyl-3-(4-methyl-1-naphthoyl)indole (JWH-122);

"(x) 1-pentyl-3-(4-chloro-1-naphthoyl)indole (JWH-398);

"(xi) 1-(5-fluoropentyl)-3-(1-naphthoyl)indole (AM2201);

"(xii) 1-(5-fluoropentyl)-3-(2-iodobenzoyl)indole (AM694);

"(xiii) 1-pentyl-3-(4-methoxy-benzoyl)indole (SR-19 and RCS-4);

"(xiv) 1-cyclohexylethyl-3-(2-methoxyphenylacetyl)indole (SR-18 and RCS-8); and

"(xv) 1-pentyl-3-(2-chlorophenylacetyl)indole (JWH-203)."

(b) OTHER DRUGS.—Schedule I of section 202(c) of the Controlled Substances Act (21 U.S.C. 812(c)) is amended in subsection (c) by adding at the end the following:

"(18) 4-methylmethcathinone (Mephedrone);

"(19) 3,4-methylenedioxypropylvalerone (MDPV);

"(20) 2-(2,5-Dimethoxy-4-ethylphenyl)ethanamine (2C-E);

"(21) 2-(2,5-Dimethoxy-4-methylphenyl)ethanamine (2C-D);

"(22) 2-(4-Chloro-2,5-dimethoxyphenyl)ethanamine (2C-C);

"(23) 2-(4-Iodo-2,5-dimethoxyphenyl)ethanamine (2C-I);

"(24) 2-(4-Ethylthio)-2,5-dimethoxyphenyl)ethanamine (2C-T-2).

# MACS

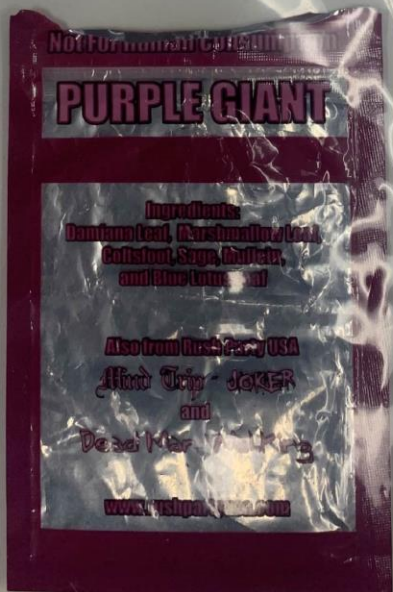
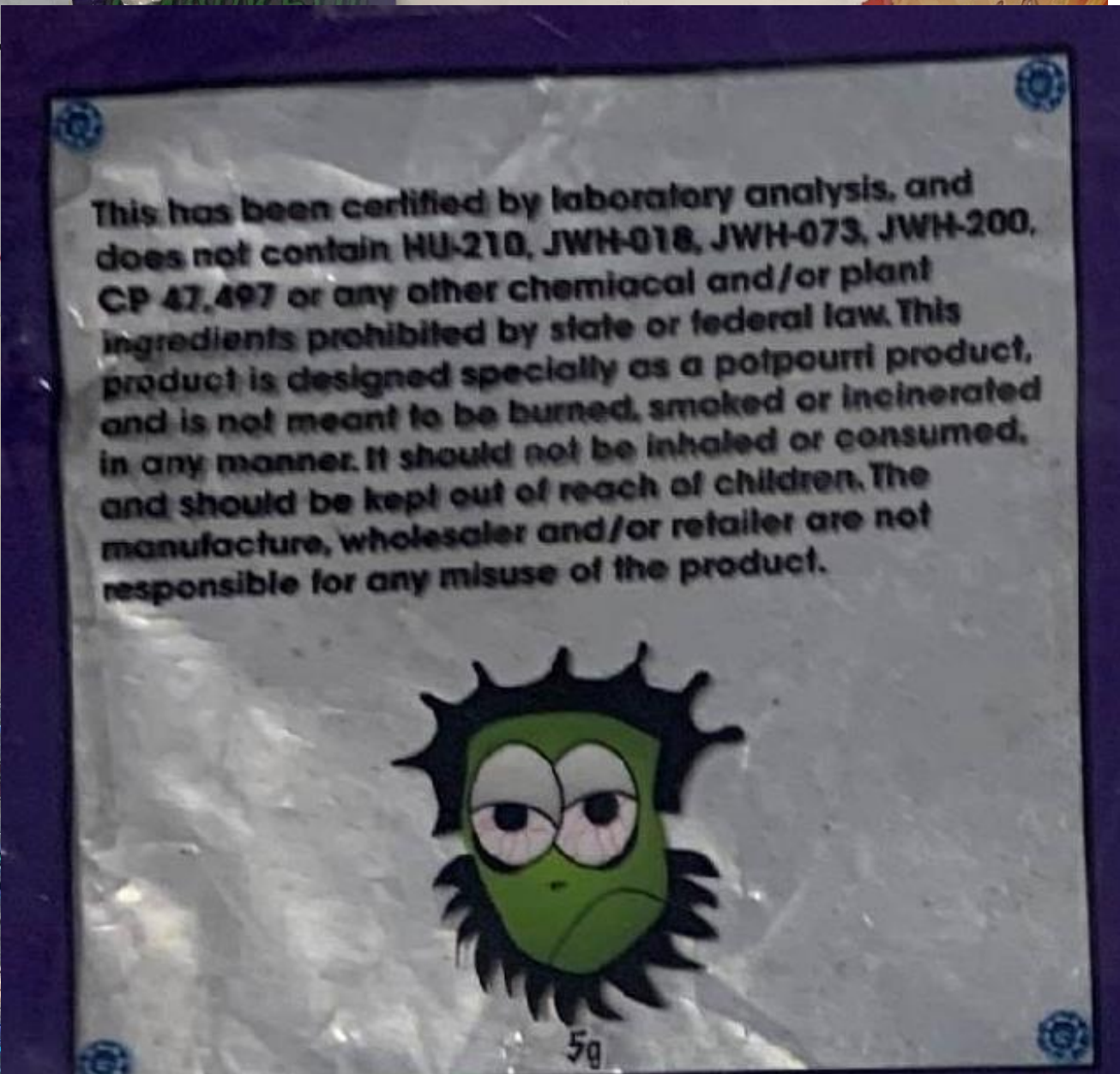


# MACS





# MACS



# SYNTHETIC CANNABINOIDS: “THE NEXT GENERATION”

- Newer compound, URB-754: Does NOT bind to CB receptors itself, but inhibits enzyme that breaks down endocannabinoids
  - More endocannabinoid around → more binding to receptors
- AND, one “spice” sample was found to contain URB + a cathinone, which reacted with one another and together created a whole new psychoactive compound



Contents lists available at SciVerse ScienceDirect

Forensic Science International

journal homepage: [www.elsevier.com/locate/forsciint](http://www.elsevier.com/locate/forsciint)



---

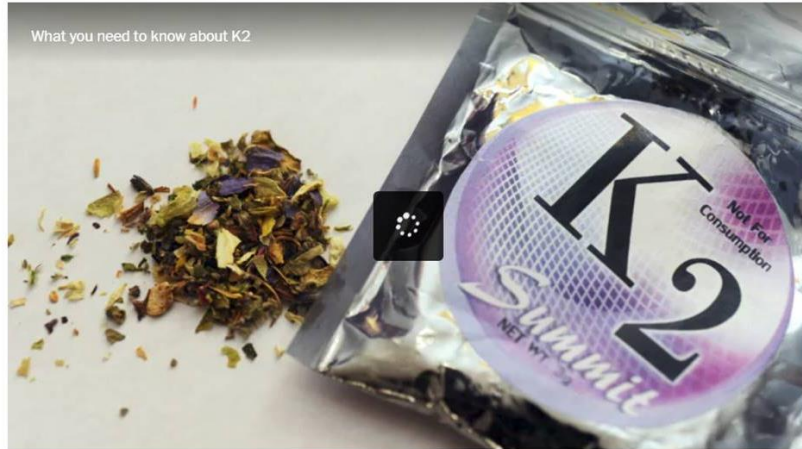
URB-754: A new class of designer drug and 12 synthetic cannabinoids detected in illegal products<sup>☆</sup>

Nahoko Uchiyama, Maiko Kawamura, Ruri Kikura-Hanajiri, Yukihiro Goda \*

*National Institute of Health Sciences, 1-18-1 Kamiyoga, Setagaya-ku, Tokyo 158-8501, Japan*

To Your Health

## Synthetic marijuana leaves two dead and dozens with severe bleeding



Synthetic cannabinoids, also known as K2, are man-made drugs often marketed as a safe, legal alternative to marijuana. (Elyse Samuels/The Washington Post)



[Home](#) [News](#) [Contact Us](#) [UM School of Pharmacy](#)

CALL THE EXPERTS 1-800-222-1222

[FIRST AID FOR POISONING](#) [FAMILIES](#) [EDUCATION](#) [HEALTH CARE PROFESSIONALS](#) [FACTS & REPORTS](#) [ABOUT US](#)

SEARCH

### FIRST MARYLAND CASE OF BLEEDING REPORTED IN USER OF SYNTHETIC CANNABINOIDS

[Home](#) / [News Center](#) / [News \(2018\)](#) / [First Maryland Case of Bleeding Reported in User of Synthetic Cannabinoids](#)

[Back to Home](#)

[News Center](#)

[Archive](#)

Maryland Poison Center notified of a case in which a user of synthetic cannabinoids experienced bleeding and was hospitalized on April 3.

By: Maryland Department of Health  
Thursday, April 5, 2018

**Baltimore, Md.** — The Maryland Poison Center and the Maryland Department of Health are warning the public of the danger of bleeding that can be linked to use of synthetic cannabinoids, also known as spice, K2, or fake weed.

The Maryland Poison Center at the University of Maryland School of Pharmacy was notified of a case in which a user of synthetic cannabinoids experienced bleeding and was hospitalized on April 3, 2018.

The symptoms in the Maryland case are similar to the description of dozens of cases in the Chicago region reported over the past few months to the Illinois Poison Center.



# SALVIA DIVINORUM

- AKA: "Yerba Maria", "The Shepherdess", "la pastora", "Diviner's Mint", "Diviner's Sage"
- Indigenous to Southern Mexico
- Used in traditional healing and divination
- Smoked, chewed, or made into tea
- Currently not controlled in U.S.
- Available in stores in 5X, 6X, and 10X conc.
- \$50-\$100/ounce leaves; \$20-\$50/gram conc.
- Salvinorin A
  - K-opioid receptor agonist
    - No serotonin activity



THANK YOU



**MACS**

# **MARYLAND ADDICTION CONSULTATION SERVICE**

*Provides support to prescribers and their practices in addressing the needs of their patients with substance use disorders and chronic pain management.*

**All Services are FREE**

- Free phone consultation for clinical questions
- Education and training opportunities related to substance use disorders and chronic pain management
- Assistance with addiction and behavioral health resources and referrals
- Technical assistance to practices implementing or expanding office-based addiction treatment services
- MACS TeleECHO™ Clinics: collaborative medical education through didactic presentations and case-based learning

1-855-337-MACS (6227)

[www.marylandMACS.org](http://www.marylandMACS.org)