

# Monitoring Online Resources for Predicting Drug Threats

W5: Unforeseen Threats (AAFS 2022 – Seattle, WA)

Alex J Krotulski, PhD

Center for Forensic Science Research and Education, Fredric Rieders Family Foundation, Willow Grove, PA.



#### **DISCLOSURES**

- I have no conflicts of interest to disclose.
- I am a scientist and employee of FRFF / CFSRE, a 501(c)(3) non-profit research and educational facility.
- NPS Discovery is funded in part by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice
  - Award Number 2020-DQ-BX-0007, "Real-Time Sample-Mining and Data-Mining Approaches for the Discovery of Novel Psychoactive Substances (NPS)"
  - The opinions, findings, conclusions and/or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect those of the Department of Justice.



#### **Presentation Overview**

- What online drug sources / resources exist?
  - Where can you buy drugs online?
  - Can you find drug use information online?
  - Why is the market so different in 2022?
- Monitoring drug use forums a research study
- Monitoring gray market vendor sites
- Where to from here? (based on what we know now)









# ONLINE DRUG SOURCES / RESOURCES

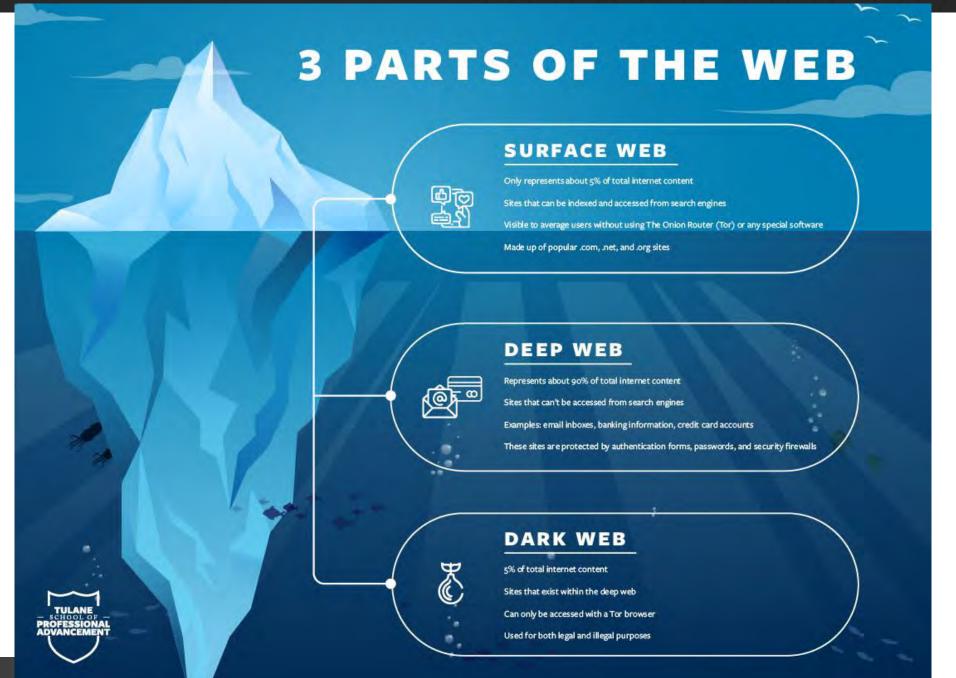


#### The Internet

- Noun: an electronic communications network that connects computer networks and organizational computer facilities around the world
- Needs no explanation it's our lifeline
- Allows for us to stay connected, stay in-the-know, and to do our jobs (better)
- For a moment think about the advancements in technology that have allowed not only for the creation of the internet but the propagation of it to our fingertips



"On the internet, nobody knows you're a dog"



#### The Surface Web

- Very useful for tracking emerging drugs and drug trends
  - Is the surface web good enough?
  - Hopefully, I can convince you of that by the end of this presentation



JAN 2021

#### DIGITAL AROUND THE WORLD

ESSENTIAL HEADLINES FOR MOBILE, INTERNET, AND SOCIAL MEDIA USE

INTERNET USER NUMBERS NO LONGER INCLUDE DATA SOURCED FROM SOCIAL MEDIA PLATFORMS, SO VALUES ARE NOT COMPARABLE WITH PREVIOUS REPORTS

TOTAL POPULATION



UNIQUE MOBILE PHONE USERS



INTERNET USERS\*



ACTIVE SOCIAL MEDIA USERS\*



7.83

URBANISATION:

56.4%

5.22 BILLION

vs. POPULATION:

66.6%

4.66 BILLION

vs. POPULATION:

59.5%

4.20

BILLION

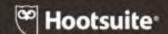
vs. POPULATION:

53.6%

B

SOURCES: THE U.N., LOCAL GOVERNMENT BODIES; GSMA INTELLIGENCE, ITU, GWI, EUROSTAT, CNINIC, APUI, SOCIAL MEDIA PLATFORMS: SELF-SERVICE ADVERTISING TOOLS, COMPANY EARNINGS REPORTS: MEDIASCOPE, "ADVISORIES; INTERNET USER NUMBERS NO LONGER INCLUDE DATA SOURCED FROM SOCIAL MEDIA PLATFORMS, SO VALUES ARE NOT COMPARABLE TO DATA PUBLISHED IN PREVIOUS REPORTS. SOCIAL MEDIA USER NUMBERS MAY NOT REPRESENT UNIQUE INDIVIDUALS. \*\* COMPARABILITY ADVISORY: SOURCE AND BASE CHANGES

we are. social



# The Age of Technology

- Internet
- Phones
- Computers
- Websites
- Cryptocurrency
- Social media
- Express mailing
- Virtual Private Network (VPN)



## Connected to the World ... At the Palm of Your Hand

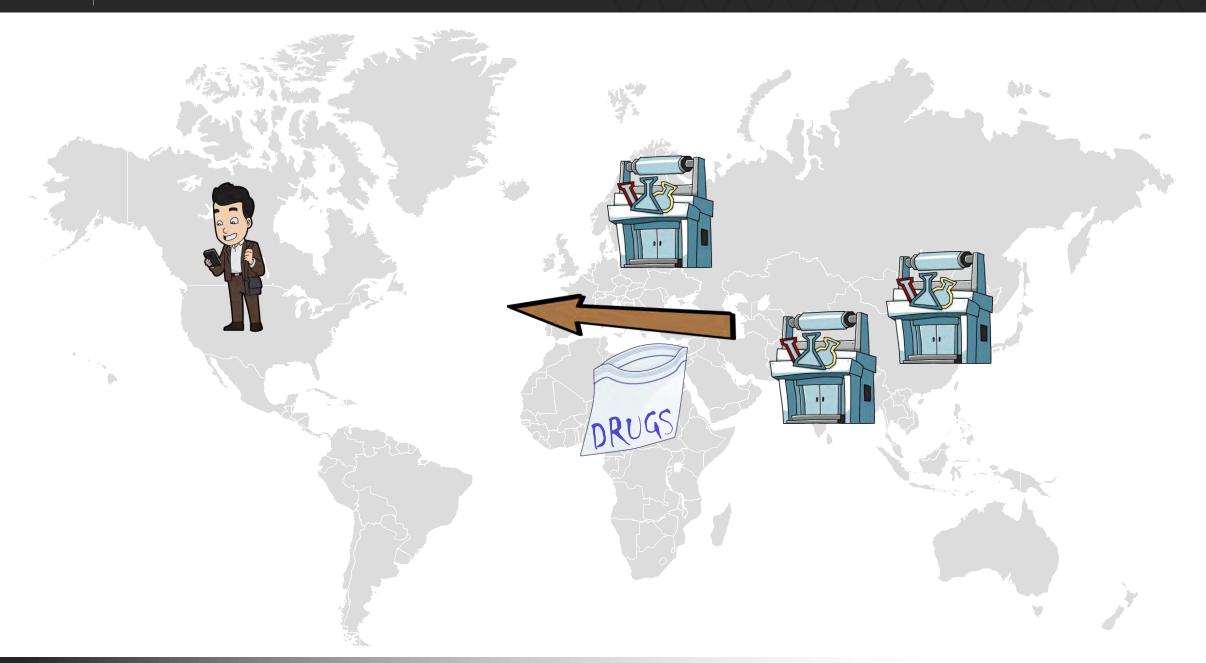














# How To Buy Illegal Drugs On The Internet (Thrillist)

- 1. Download Tor
- 2. Take precautions
  - "... cover your webcam with tape while browsing, as a precaution against hackers peaking back at you."
- 3. Get some Bitcoins
- 4. Start browsing
  - "... navigating the Dark Web isn't as simple as getting around the Internet normally is. You may sympathize with your grandparents at first."
  - "The extra time put into the process will be worth the comfort of knowing you're protecting yourself."
- 5. Investigate the vendor
- 6. Wait
  - "You're not placing a fast-food order, you're covertly buying illegal substances from an underground marketplace."
- 7. Enjoy

#### Thrillist.

CITIES + EAT DRINK TRAVEL CANNABIS WATCH SHOP

LIFESTY

# How To Buy Illegal Drugs On The Internet

By Supercompresso

ublished on 8/3/2015 at 3:00 A

The Internet has revolutionized the way we communicate, engage with the world, and hide porn from our parents. It was only a matter of time before the drug trade caught up.

Yes, you can buy illegal drugs on the Internet, and it's a lot safer for you than dealing with the types of characters you expect to meet on AMC's next acclaimed series. The dealers on the darknet markets are less Walter White, more Walt Jr. If you don't know how to access them, though, you're liable to feel as clueless as Hank. (Don't worry, we promise not to work every *Breaking Bad* character into this article.)

Now, first of all, if you're trying to buy hard narcotics, don't. Stop now, and get help. Buying drugs online is a lot safer than buying them in person, but far less safe than never buying them at all.

That said, if you're in the market for something harmless, here's a guide on getting to the sites that will replace your sketchy dealer.

#### 1. Download Tor

In order to access the parts of the web where you'll find darknet markets, you need to start by downloading Tor, the most popular system for anonymous web browsing. Read all of their recommendations before installing, and be sure you've got the latest version. Use the Tor browser whenever accessing the Dark Web.

PSA: Parents, if you spot Tor on your kid's computer, now you know why it's there. While Tor is legitimately valuable for helping people living under repressive regimes communicate and organize without alerting the government, for an American teen, it's a tool to do everything you worry abut your children doing on the Internet.

#### 2. Take precautions

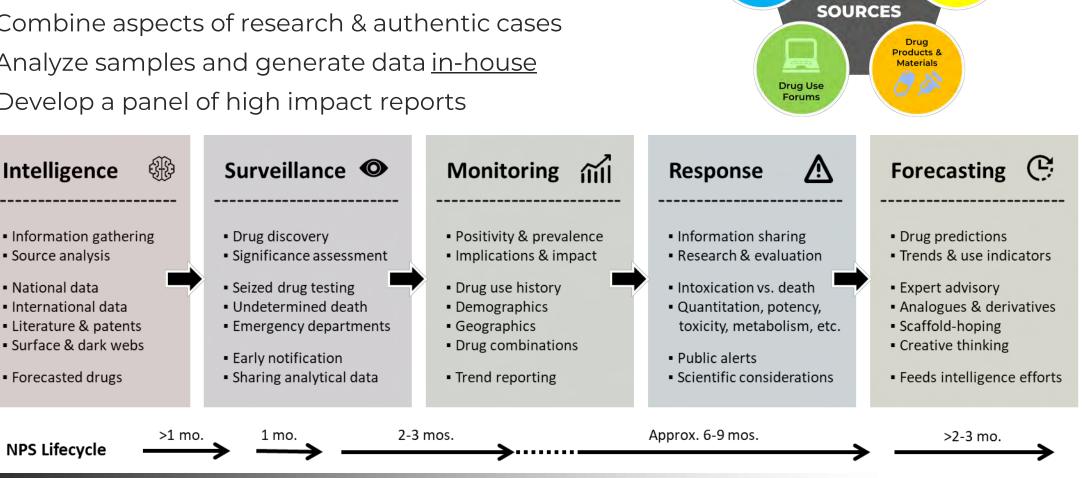
Know how you instinctively roll up the car windows when cruising into a bad neighborhood?

Exploring the Dark Web is a lot like that. Many suggest that you get yourself some PGP encryption software, which will let you send your personal information in an encrypted format. GnuPGP is a



#### NPS Discovery at the CFSRE

- Open-access national drug early warning system
  - Combine aspects of research & authentic cases
  - Analyze samples and generate data <u>in-house</u>
  - Develop a panel of high impact reports



Impaired

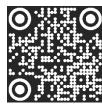
**PRIMARY** 

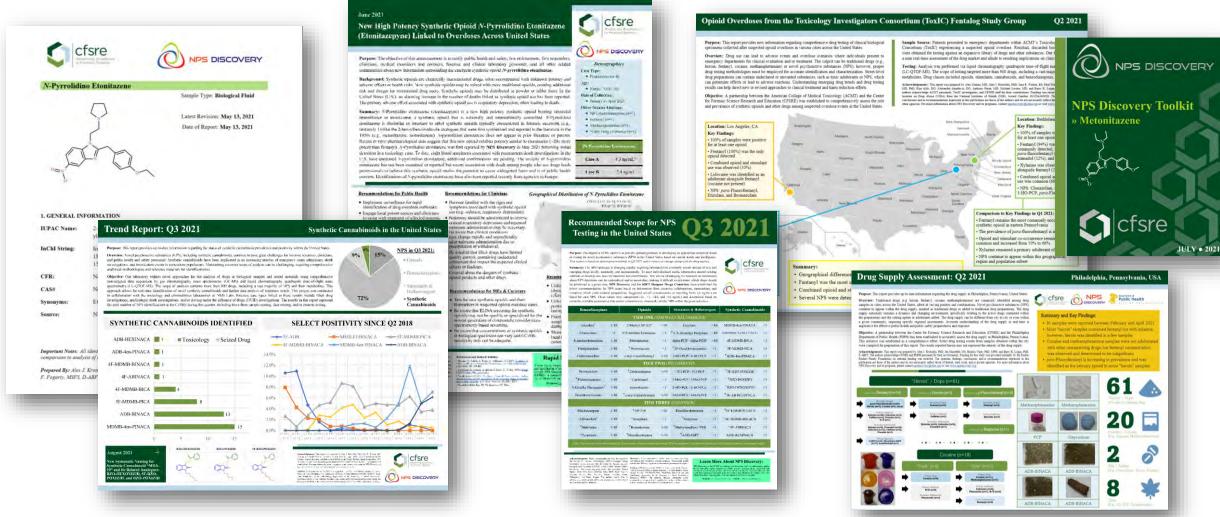
DATA

Department

Toxicology

## NPS Discovery Reports -> www.npsdiscovery.org











REDDIT DRUG MONITORING

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#### International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo



Research paper

# Online surveillance of novel psychoactive substances (NPS): Monitoring Reddit discussions as a predictor of increased NPS-related exposures



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Open Access: https://www.sciencedirect.com/science/article/pii/S095539592100298X?via%3Dihub

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### Online Surveillance of Novel Psychoactive Substances

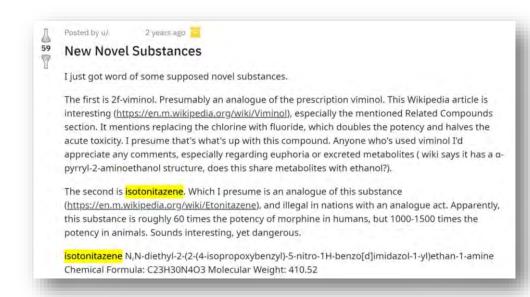
- Feasibility study is there value?
  - Ad-hoc monitoring Reddit since 2015

#### Primary goal:

- Determine if drug use forum posts could serve as an early indicator for future increased forensic cases
- Toxicology vs. chemistry ???

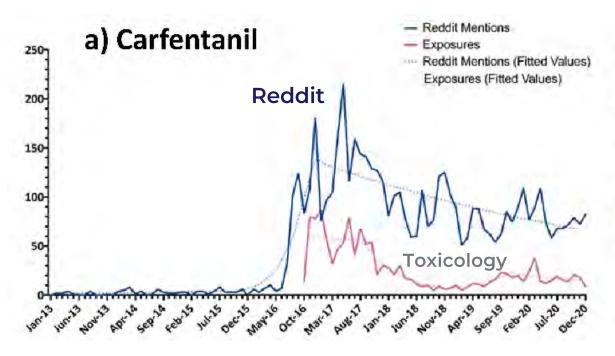
#### Methods:

- Selected 8 NPS with prior prevalence
- Develop algorithm to capture keywords from posts
- Tabulate toxicology data from CFSRE & NMS Labs
- Analysis of trends and influential factors
  - · Compared to drug scheduling actions



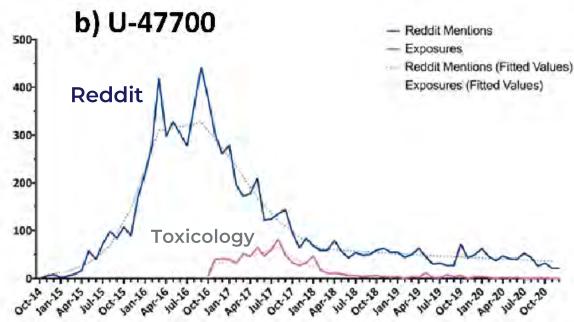
Category	Subreddit Names
Drug-Specific	r/1P_LSD, r/2cb, r/4acodmt, r/adderall, r/afinil, r/ambien, r/AMT, r/Ayahuasca, r/cocaine, r/cripplingalcoholism, r/DMT, r/DPH, r/dxm, r/fentanyl, r/ketamine, r/kratom, r/LSA, r/LSD, r/MDMA, r/MemantineHCl, r/mescaline, r/meth, r/PCP, r/phenibut, r/PsilocybinMushrooms, r/Salvia, r/shroomers, r/shrooms
Drug Class-Specific	r/benzodiazepines, r/dissociatives, r/DissonautUniverse, r/gabagoodness, r/microdosing, r/noids, r/opiates, r/Opioid_RCs, r/PsychedelicMessages, r/Psychedelics, r/PsychedSubstance, r/Psychonaut, r/RationalPsychonaut, r/Stims, r/treedibles, r/trees, r/tryptonaut
Other/General	r/AnAnswerToHeal, r/AskDrugNerds, r/askdrugs, r/aves, r/bestoferowid,
Discussion	r/CurrentlyTripping, r/druganalytics, r/druggardening, r/DrugNerds, r/Drugs, r/DrugShowerThoughts, r/DrugsOver30, r/erowid, r/ObscureDrugs, r/ReagentTesting, r/researchchemicals, r/samelevel, r/TheDrugClassroom, r/TheeHive, r/tripreports, r/TripSit, r/TripTales

# "Old" NPS Opioids



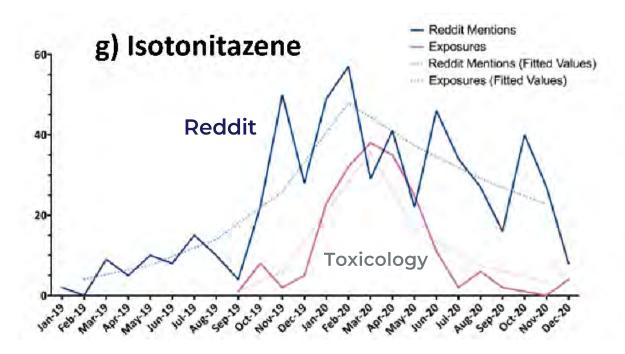


- DEA Schedule 1 in 1988
- Adverse reviews / media influence



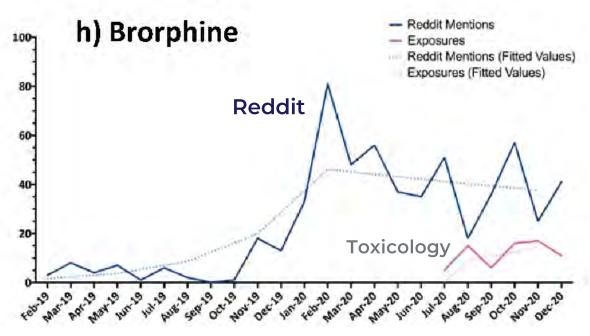
- Not a fentanyl analogue!
- DEA files intent to schedule Sept. 2016
- China implements ban July 2017

## "New" NPS Opioids



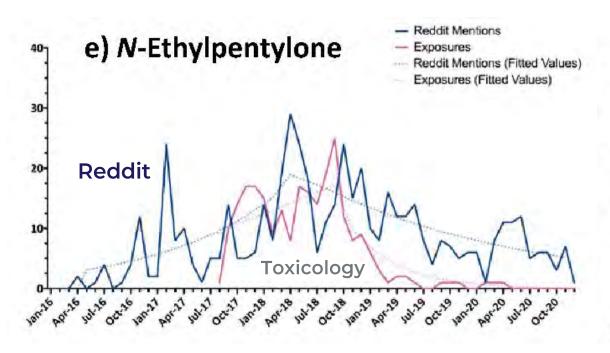


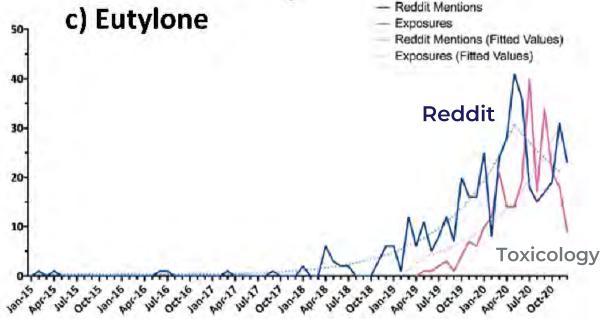
- DEA files intent to schedule June 2020
- Shorter span of posts / comments



- DEA files intent to schedule Dec. 2020
- Decline in positivity continued into 2021

# NPS Stimulants (Cathinones)

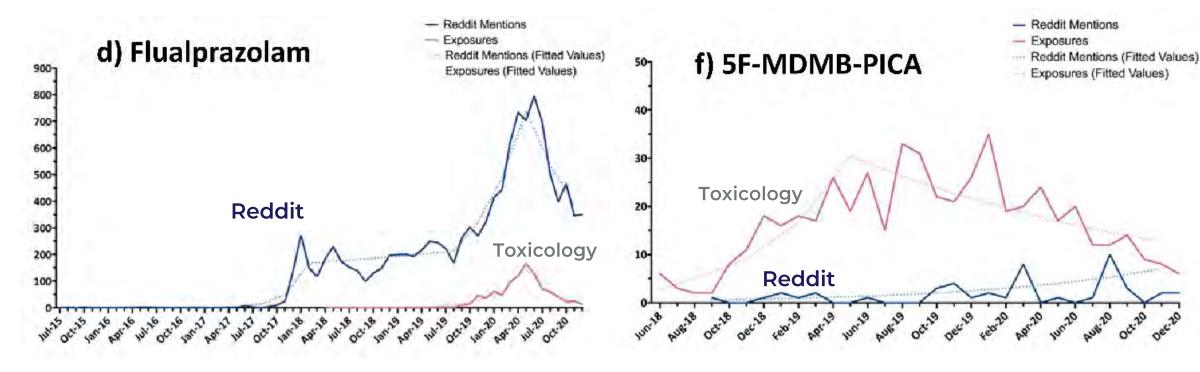




- First emerged in Europe in 2016
- Filled a market void due to scheduling
- DEA scheduled in August 2018

- First emerged 2014, not market void
- Replacement for N-ethyl pentylone
- Isomer of pentylone (scheduled in 2017)

# "Old Ball" NPS - Benzo and Synthetic Cannabinoid

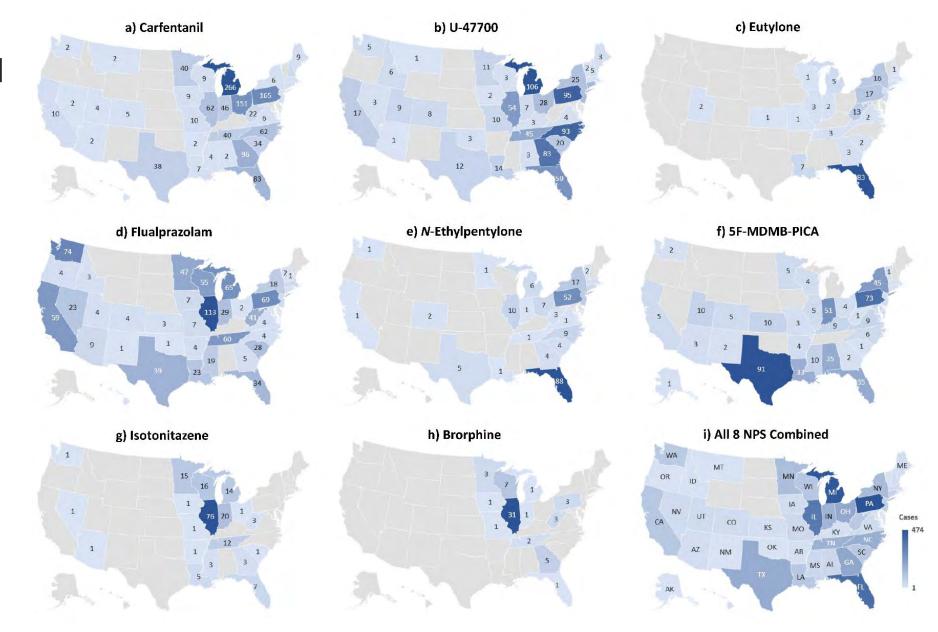


- Etizolam strong grip on market
- Positivity of NPS benzos increased in 2020
- International control announced Mar. 2020

- Complex / confusing name ???
- DEA files intent to schedule Dec. 2019



### Geographical Differences Observed



### Online Surveillance of Novel Psychoactive Substances

#### Conclusions:

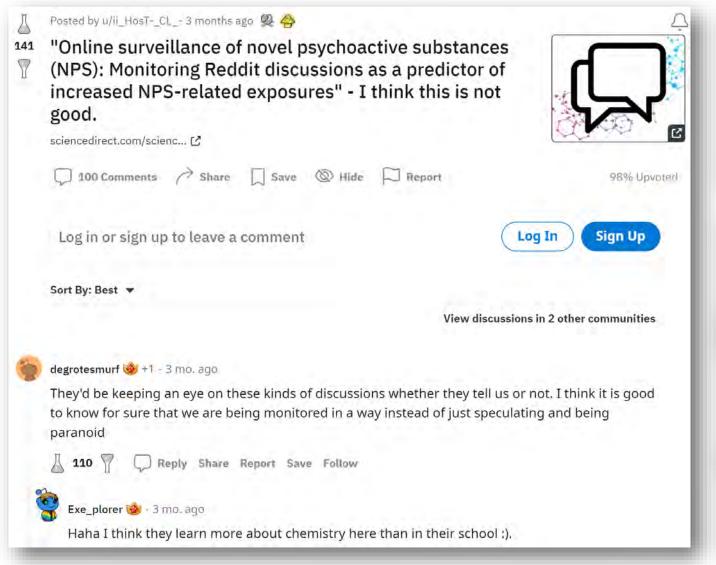
- All NPS appeared on Reddit and in toxicology cases in the US
- Almost all appeared in discussions prior to implications in exposure cases
  - Except 5F-MDMB-PICA
- The timeframe between peak mentions and peak cases varied
  - Mean 5.2 months, median 5 months, range 1–11 months
- Distinct increases and decreases observed
  - Appeared to be influential factors

#### • Future directions:

- Additional drug forums
- Crime lab / drug material data
- International toxicology data
- Additional samples / data sources
- Geographical differences
- Future NPS / real-time tracking

#### Implement as part of Early Warning System









Calling members of research chemicals subreddit- the feds are watching!

1 1 Reply Share Report Save Follow



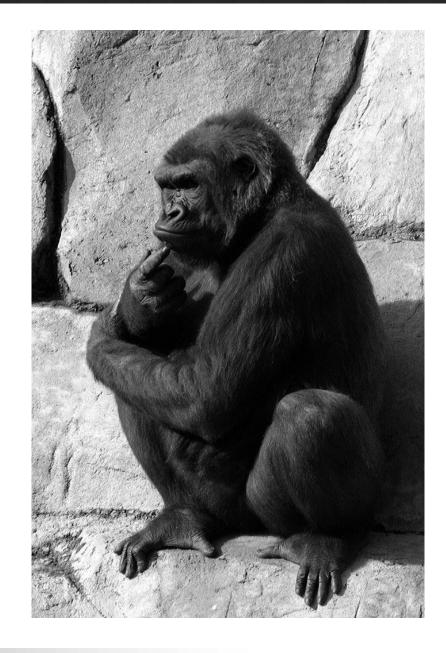
### But what sparks a Reddit post?

Reddit policy = "No sourcing"

#### **About Community**

[STRICTLY NO SOURCING] subreddit for the discussion of synthetic psychoactive research chemicals a.k.a. Novel Psychoactive Substances (NPS)

- Links to internet vendor sites
  - Dark web markets?
  - Gray market sites same drug names!







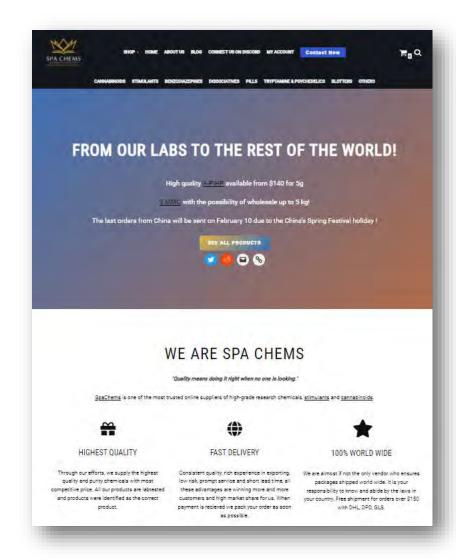


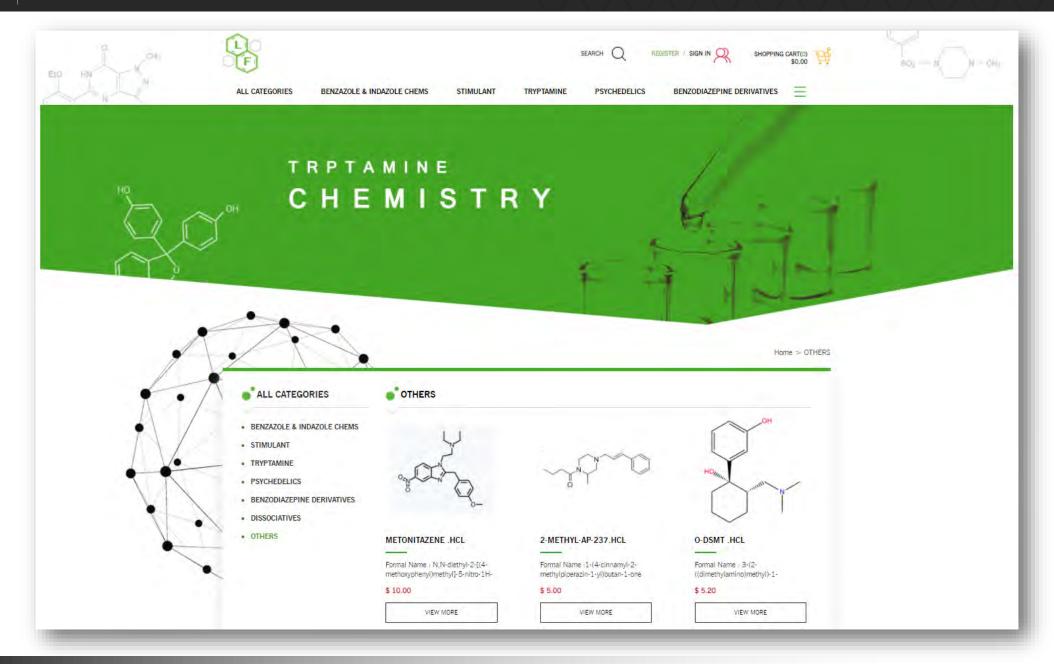
# MONITORING GRAY MARKET SITES

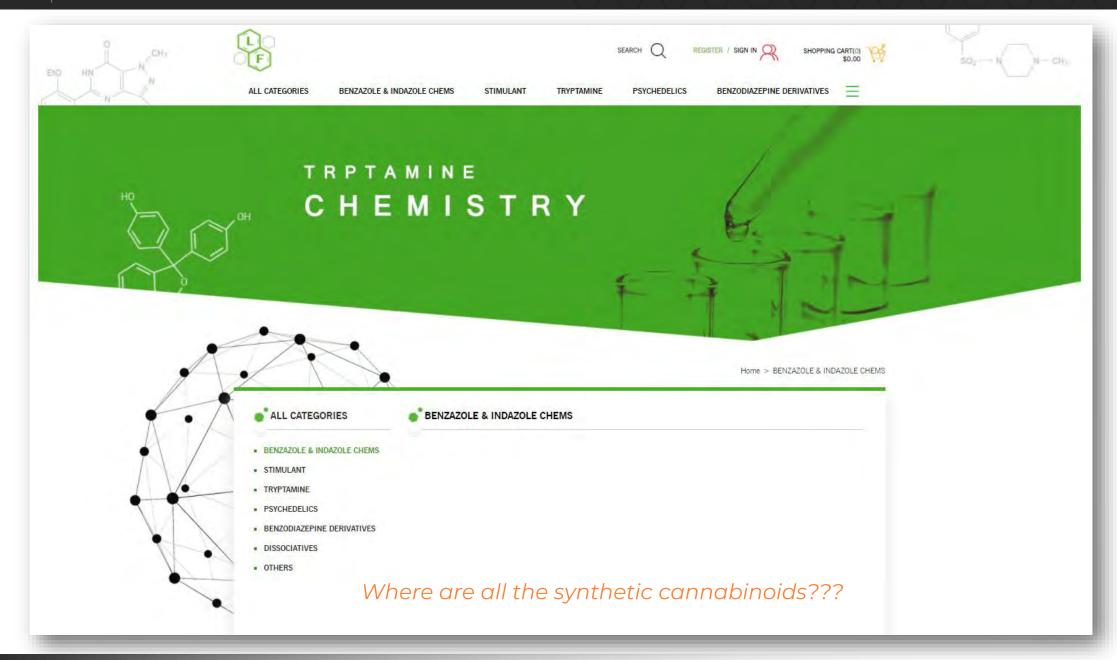


#### Monitoring Gray Market Sites

- What are "gray market sites"?
  - Surface level websites
  - Varying levels of sophistications
  - Varying levels of apparent legitimacy
  - Not "trusted" vendors
  - Might be selling legal and/or illegal drugs
  - Doesn't appear to be a good paper trail
  - Probably don't have good customer support
- More info on Synthetic Cannabinoids and Gray Market Sites ?!
  - Toxicology Section, K42, Thursday February 24<sup>th</sup> from 1:45 2:00 p.m.
  - Krotulski → Explanation and Impacts of a Class-Wide Ban on Synthetic Cannabinoids:
     What Does the Future Hold for this Already Challenging NPS Subclass?









HOME NEW CHEMICALS STIMULANTS OPIOIDS EMPATHOGENS DISSOCIATIVES PSYCHEDELICS CANNABINOIDS SEDATIVES

TERMS OF SALE SHIPPING, PAYMENT ABOUT COMPANY CUSTOM SYNTHESIS CONTACT BONUS CERTIFICATES BLOG TRACK Q

NEW CHEMICALS · PSYCHEDELICS

4-HO-MPT

admin 4 days ago

ORDER REGISTRATION











NEW CHEMICALS · PSYCHEDELICS
5-MeO-MET



NEW CHEMICALS · OPIOIDS

N-desethyl Isotonitazene



## About company

ChemsPromo is ready to offer a very wide range of new research chemicals, which are constantly updated and experimental chemical studies occur every day in our laboratories. We are ready to deal with both large research companies and private individuals.

If you did not find what you were looking for, there is always the possibility of an individual synthesis for your requests.

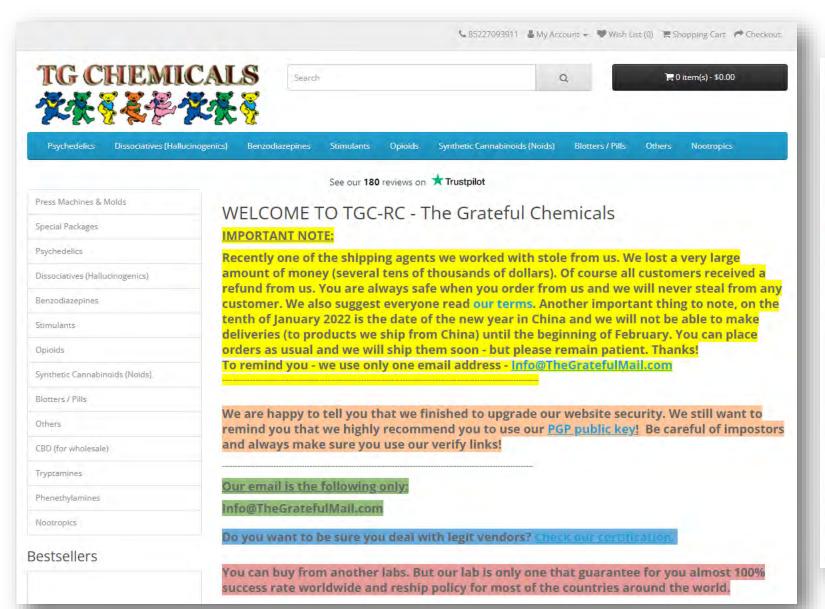


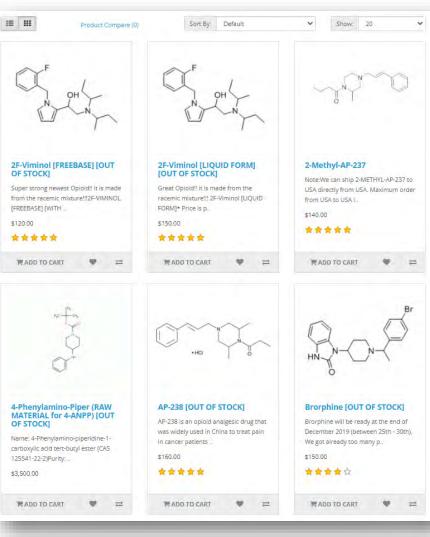
### Contact:

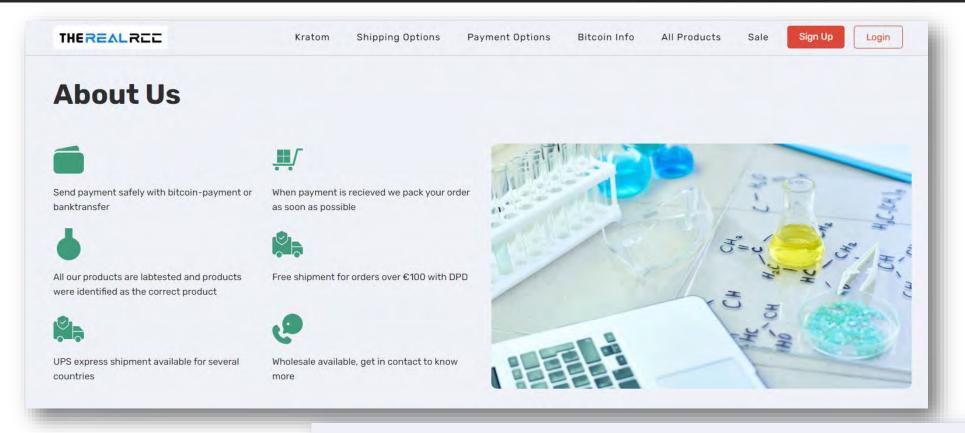


sales@chempromo.com

chpromo@protonmail.com







# The Real RCC is a company registered in Europe, since 2018.

#### The Real RCC is a company registered in Europe, since 2018.

The Real RCC is one of those few online companies, who supply highly pure research chemicals for individual and/or corporate laboratory research and analysis. We offer our customers both most demanded as well as rare research chemicals of at least 98% purity. Every new batch of product passes laboratory tests and arrives to us complete with certification of analysis, this way we always know that we supply our customers with exceptionally pure chemicals.



THEREALREE

THEREALREE

Kratom

Shipping Options

Kratom

Payment Options

Shipping Options

Bitcoin Info

Payment Options

Connect us on discord: https://discord.gg/fd

All Products

Tryptamines

Bitcoin Info

# A quick explanation on Bitcoin for our customers

#### A quick explanation on Bitcoin for our customers

Bitcoin is a virtual currency which blossomed in public consciousness after its price-per-coin rose above \$13,000 in early 2018. The cryptocurrency (one of me intersection of privacy policy, banking regulation, and technological innovation. Some retailers accept bitcoin, for example, while in other jurisdictions, bitcoin

### **Cryptocurrency Defined**

Cryptocurrencies are just lines of computer code that hold monetary value. Those lines of code are created by electricity and high-performance computers. Or digital currency. Either way, it is a form of digital public money that is created by painstaking mathematical computations and policed by millions of computer of there is nothing to hold although you can exchange crypto for cash.

Crypto comes from the word cryptography, the security process used to protect transactions that send the lines of code for purchases. Cryptography also controls the creation of new coins, the term used to describe specific amounts of code. Hundreds of coin types now dot the crypto markets; only a handful have the potential to become a viable investment.

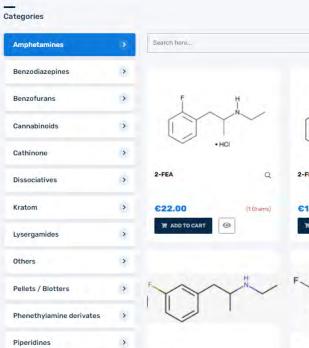
Governments have no control over the creation of cryptocurrencies, which is what initially made them so popular. Most cryptocurrencies begin with a market cap in mind, which means that their production will decrease over time thus, ideally, making any particular coin more valuable in the future.

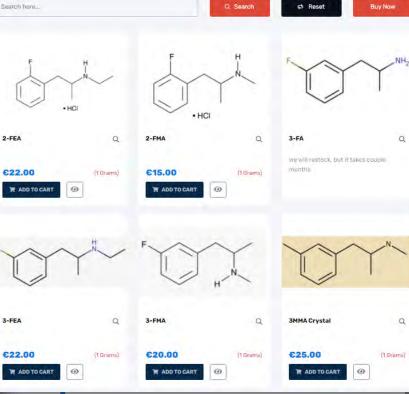
#### What Are Bitcoins?

Bitcoin was the first popular cryptocoin. No one knows exactly who created it — most cryptocurrencies are designed for maximum anonymity — but bitcoins first appeared in 2009 from a developer supposedly named Satoshi Nakamoto. He has since disappeared and left behind a Bitcoin fortune.

Because bitcoin was the first major cryptocurrency, all digital currencies created since then are called *altcoins*, or *alternative coins*. Litecoin, peercoin, feathercoin, ethereum and hundreds of other coins are all altcoins because they are not bitcoin.

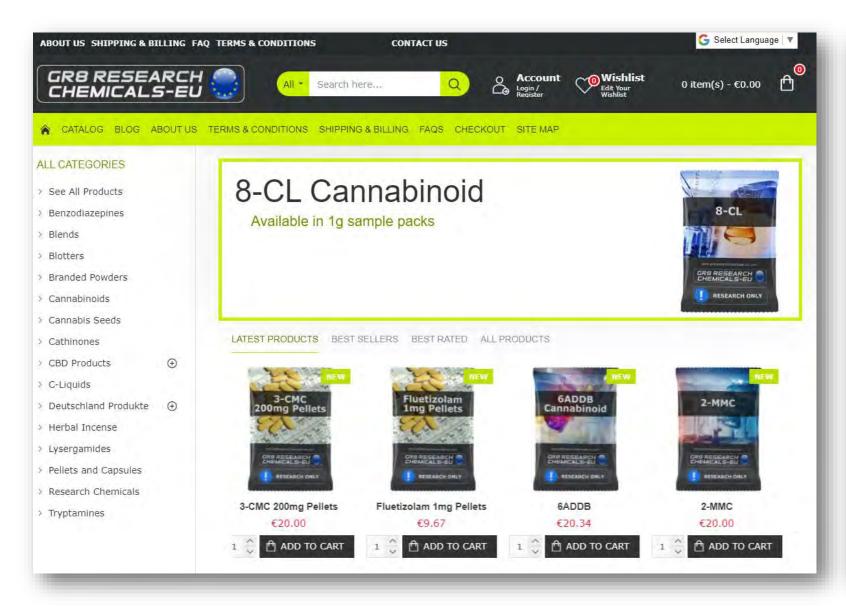
we always know that we supply our customers with exceptionally pure chemicals.





### tered

dual and/or corporate laboratory research and analysis. We offer our customers both sses laboratory tests and arrives to us complete with certification of analysis, this way



#### FAQ

Want to know how to buy research chemicals online for your research needs in Europe? We are here to help your queries. Go through our FAQ page to know more details.

#### Where is my order shipped from?

Depending on what products are ordered, we ship from 2 different fulfilment centres, both based in EU countries

Does gr8researchchemicals-eu.com ship to the U.K.
No, not under any circumstances.

#### I have received an email requesting further information labelled "Security Check"

We will occasionally check the authenticity of our customers to prevent fraudulent purchases. If you have no trading history with us any order over €100 will be put on hold, and you will be asked to provide proof of identity, your order will not be processed under any circumstances until this information is supplied. We will also ask for this information if your ordering pattern dramatically changes for example you have 10 previous orders each under €50 then you place an order to the value of €300, this is outside your normal ordering pattern and will cause a security check to be raised.

#### I have not received any email updates have you shipped my order?

All orders will receive email updates, If you have not yet received an email then please check your junk mailbox as some emails seem to be directed there. You may also log in to your account and see the status of your order at any time.

#### What are your payment processing capabilities?

We only accept Cryptocurrency or Bank Transfer, as payment methods.

#### How long should my order take to arrive?

EU orders will normally arrive within a week. Non EU orders will take a little longer, the average shipping time is 3 - 12 business days but can take longer.

#### Do you offer Express Shipping?

Currently, we only offer shipping via the postal service as this proves to be the best method for our customers.

#### How much can I order from you?

We can supply anything from 250 mg, up to many kilograms of chemicals. Please contact us for a quote, if the amount you require is not listed.

#### Do you accept PayPal?

We do not accept PayPal, I'm afraid.

#### Do you supply free samples?

No we do not supply free samples. You can buy samples from this website, at very reasonably prices. If you are a regular customer and require a sample with an order just ask in the comments section, the dispatcher would usually accommodate you if they are in a good mood 10).

#### I ordered the wrong item can I return or replace it?

No sorry...due to the nature of this business all sales are final. If you make a mistake, contact us immediately to cancel or amend your order, however...if we have already processed your order, then we will not be able to amend it. There are no exceptions to this!

#### Is your company legit?

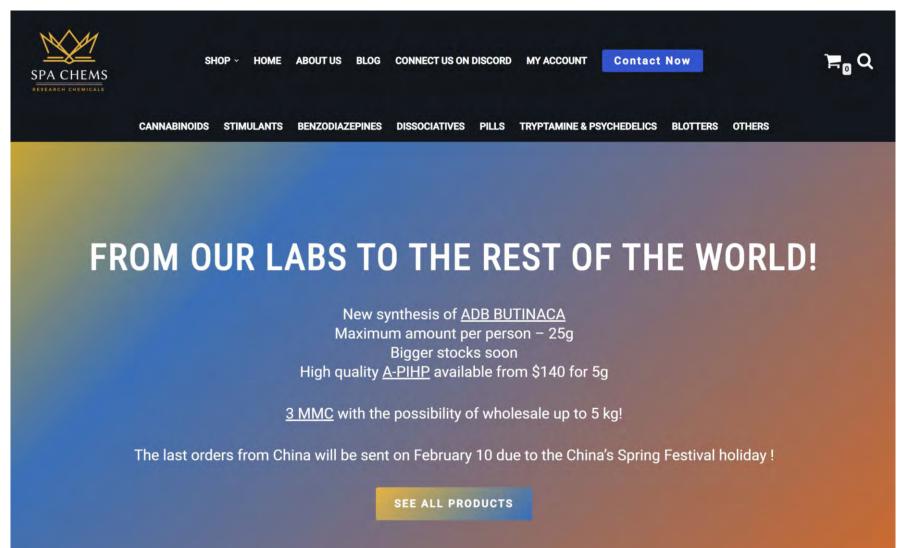
The answer is yes, we are 100% legitimate! gr8researchchemicals-eu.com has been selling research chemicals, for many years, and the team behind it have been in the business for many years. See our Trustpilot reviews, for a true reflection of us.

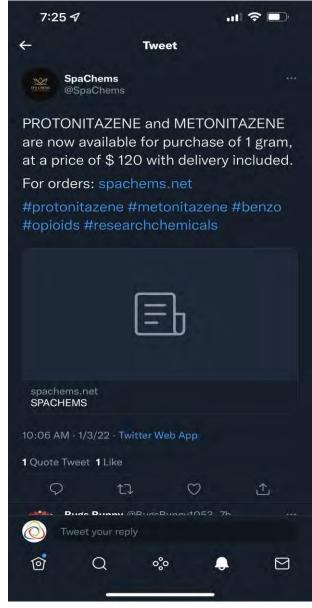
#### How will my order be packaged?

All orders are package very discreetly in padded envelopes or envelopes with heat sealed sachets inside, no mention of products names or the website name on the outside of the packages. Full chemical details are supplied on the internal packaging.

#### How can you guarantee my order will arrive to my address?

If you live in the E.U. and you had your order shipped by a trackable method then yes you are covered by our reshipment policy. If your order does not arrive we will simply reship it free of charge after 30 days, please note we will only allow 1 free reship, and it's your responsibly to check legalities, if the package has been taken by customs because it's not legal in your country or your package was not a recorded tracked package i.e. standard airmail then you will NOT qualify for any free







ADB-BUTINACA

\*\*\*\* \$195.00 - \$792.00



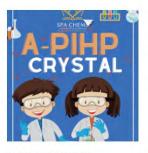
JWH-210 \*\*\*\*

\$40.00 - \$1,300.00



7-ADD

\$120.00 - \$8,000.00



A-PIHP CRYSTAL

\*\*\*\*

\$140.00 - \$3,400.00



A-PVP CRYSTAL (FORBIDDEN)



BTCP CRYSTAL \$130.00 - \$7,700.00



METONITAZENE

\$120.00 - \$5,700.00



**EMYLCAMATE** 

\$210.00 - \$6,000.00



SGT-25 (FORBIDDEN)



AB-FUBINACA (FORBIDDEN)



ADB-FUBINACA (FORBIDDEN)



3-MMC \*\*\*\*

\$133.00 - \$23,000.00



4C-MAR

\$180.00 - \$5,300.00



4B-MAR

\$170.00 - \$5,300.00



DIPYANONE

\$300.00 - \$8,500.00



BUTONITAZENE

\$300.00 - \$5,900.00



5F-MDMB-2201 (FORBIDDEN)



4F-ADB (FORBIDDEN)



4F-MDMB-2201 (FORBIDDEN)



CYPUTYLONE

\$130.00 - \$2,500.00



A-D2PV

\$145.00 - \$2,600.00



6-APB

\$110.00 - \$9,700.00



ETAZENE

\$220.00 - \$4,900.00



PROTONITAZENE

\$120.00 - \$8.500.00



### **Drug Name**

**IUPAC Name** 

Structure •

Forensic?

Description •



Description Additional information Reviews (0)

Metonitazene is an analgesic drug related to etonitazene, which was first reported in 1957, and has been shown to have approximately 100 times the potency of morphine by central routes of administration, but if used orally it has been shown to have approximately 10 times the potency of morphine. Its effects are similar to other opioids like fent and her, including analgesia, euphoria, sleepiness. Adverse effects include vomiting, and respiratory depression that can potentially be fatal. Because of high dependency potential and dangerous adverse effects it has never been introduced in pharmacotherapy.

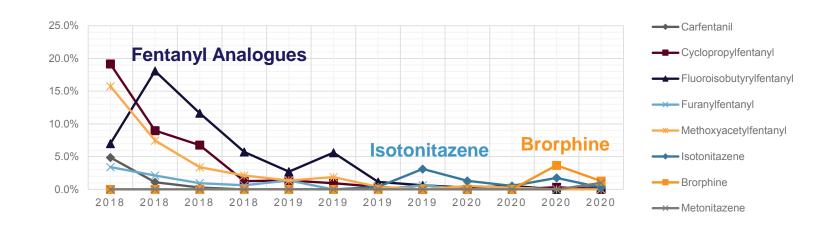


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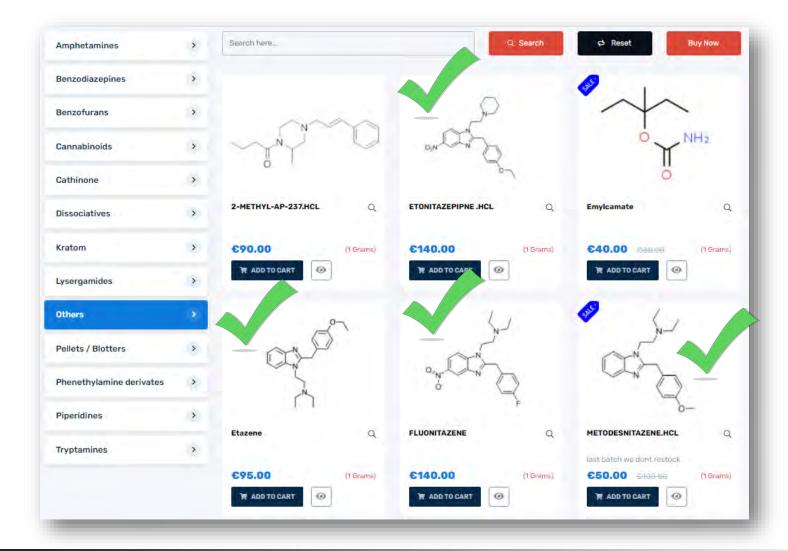
### Links to Forensic Cases - Metonitazene

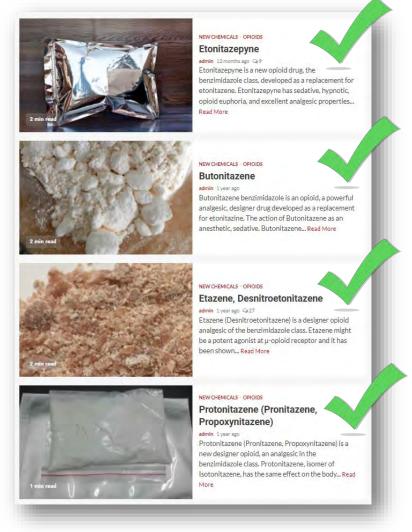
- Post-fentanyl analogue core structure scheduling
  - What's coming next? → Gray market sites
- Isotonitazene and brorphine next new synthetic opioids
- Notice of intent to schedule in 2020 (DEA)
- 2021 → metonitazene listed for sale / toxicology cases





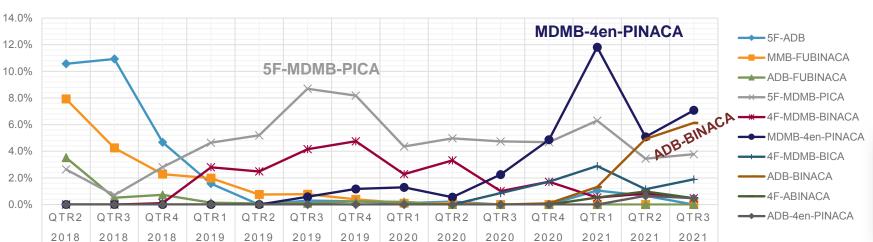
### Links to Forensic Cases - Other "Nitazenes"





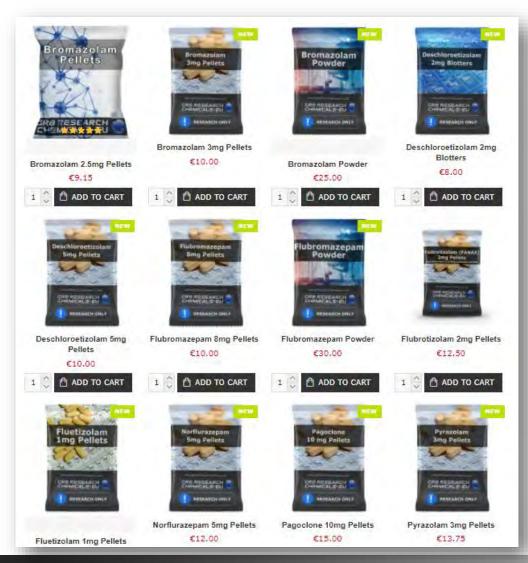
### Links to Forensic Cases - ADB-BINACA / ADB-BUTINACA

- Similar scenario to the NPS opioid examples
- 5F-MDMB-PICA scheduled in March 2021
- MDMB-4en-PINACA and ADB-BINACA fill the void
   MDMB-4en-PINACA internationally controlled in 2021

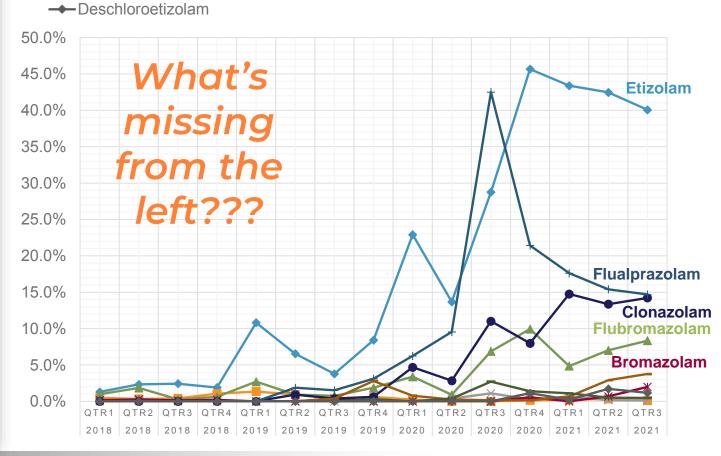




### Links to Forensic Cases - Benzodiazepines

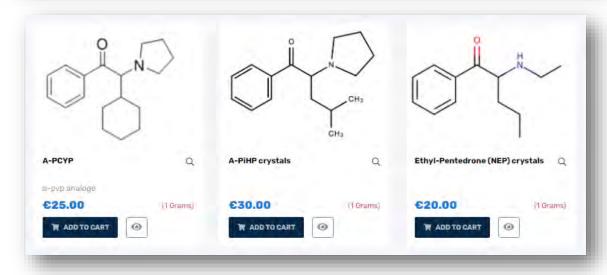


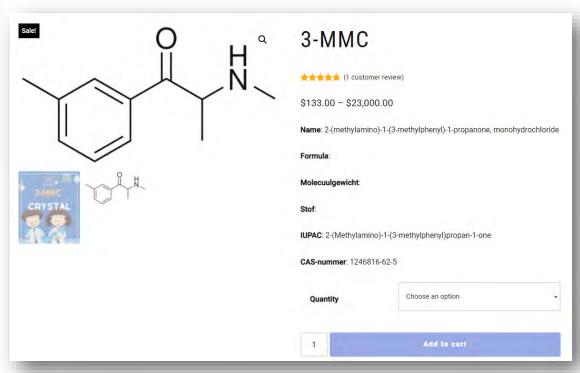




## Links to Forensic Cases - New Landscape of Stimulants





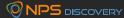




## Conclusions & Take Aways

- The technology age and buying drugs ...
  - The world is different in 2022
- Surface websites are useful for monitoring drugs
  - Drug use forums and gray market sites
  - A lot of information!
- Not all drugs online are identified / become prevalent
  - Conversely, not online ≠ not on market (many factors!)
- Where to from here?
  - Continued research and monitoring → EWS
  - Only consistency with NPS is inconsistency





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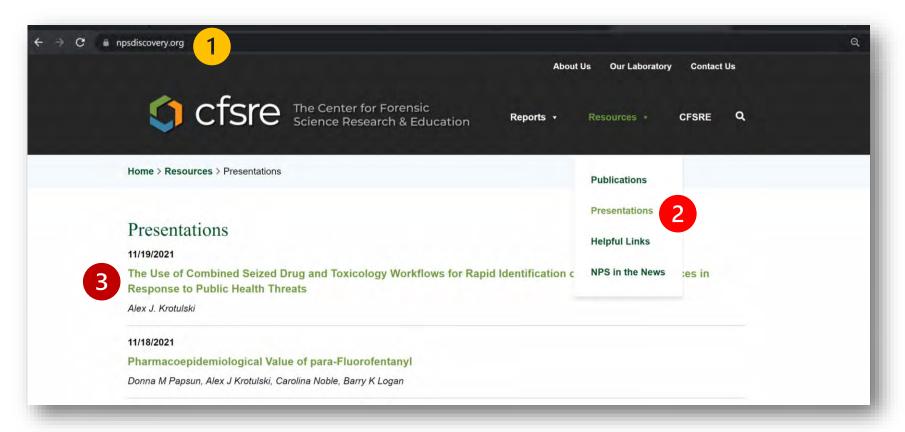
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# Thank you!

# Questions?

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