



Not Your Mama's Grass Anymore: Emerging Trends in Drug Testing

Anthony G. Costantino, Ph.D. D-ABFT

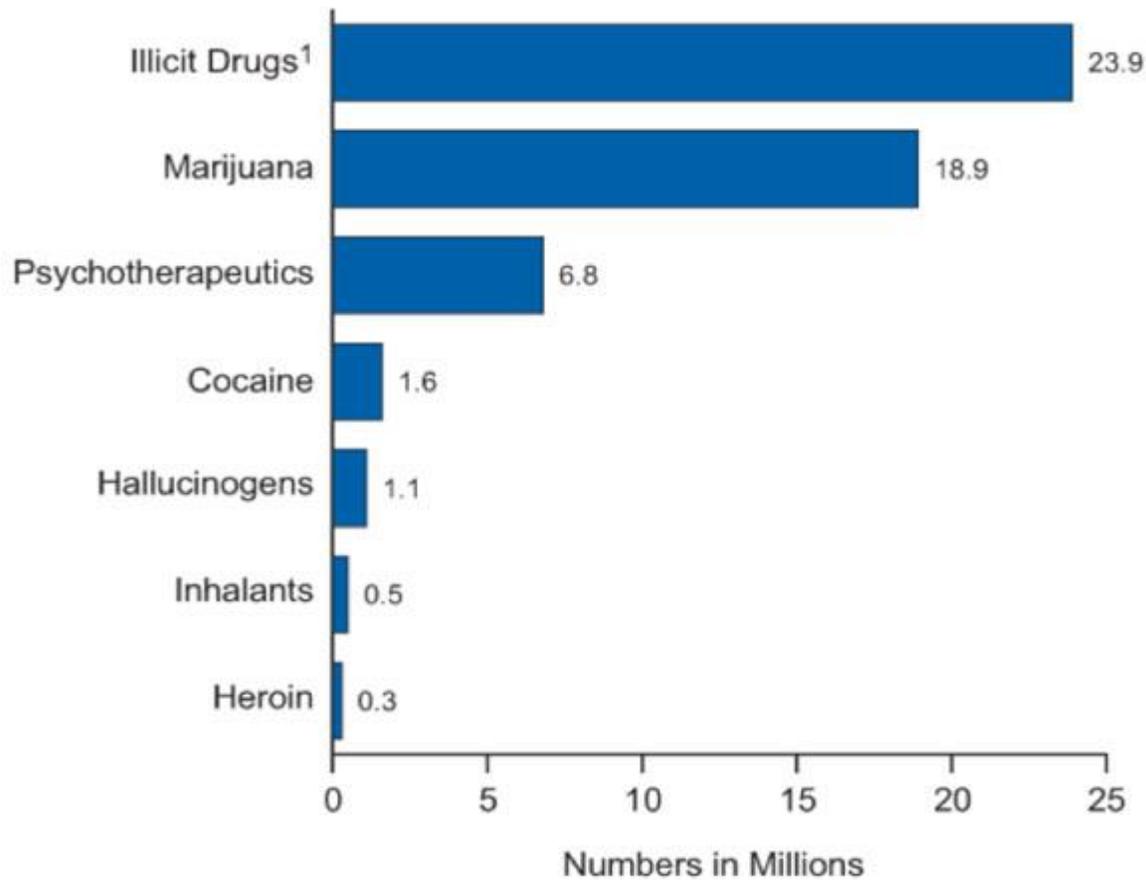
TOXICOLOGY MONITORING

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Overview

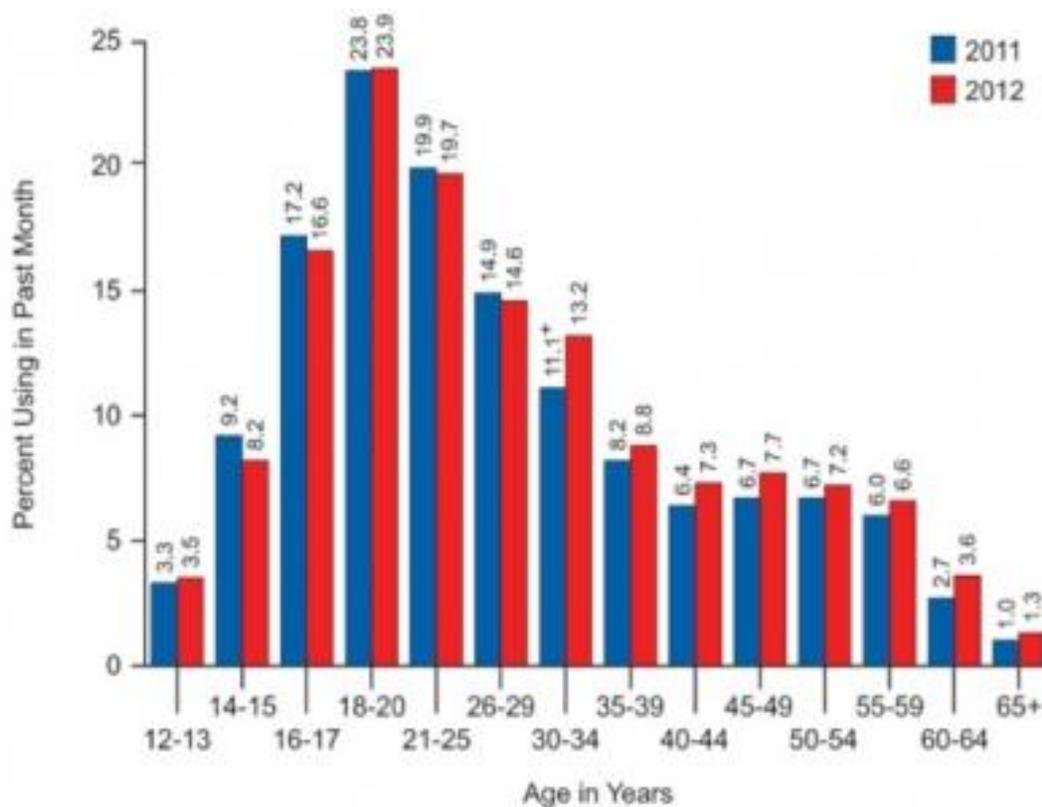
- Drug Abuse Trends in the United States
- Update on synthetics “Designer” drugs
- Updates on testing for these drugs in the laboratory
- Overview of Marijuana as a medicine

Illicit drug use in America has been increasing



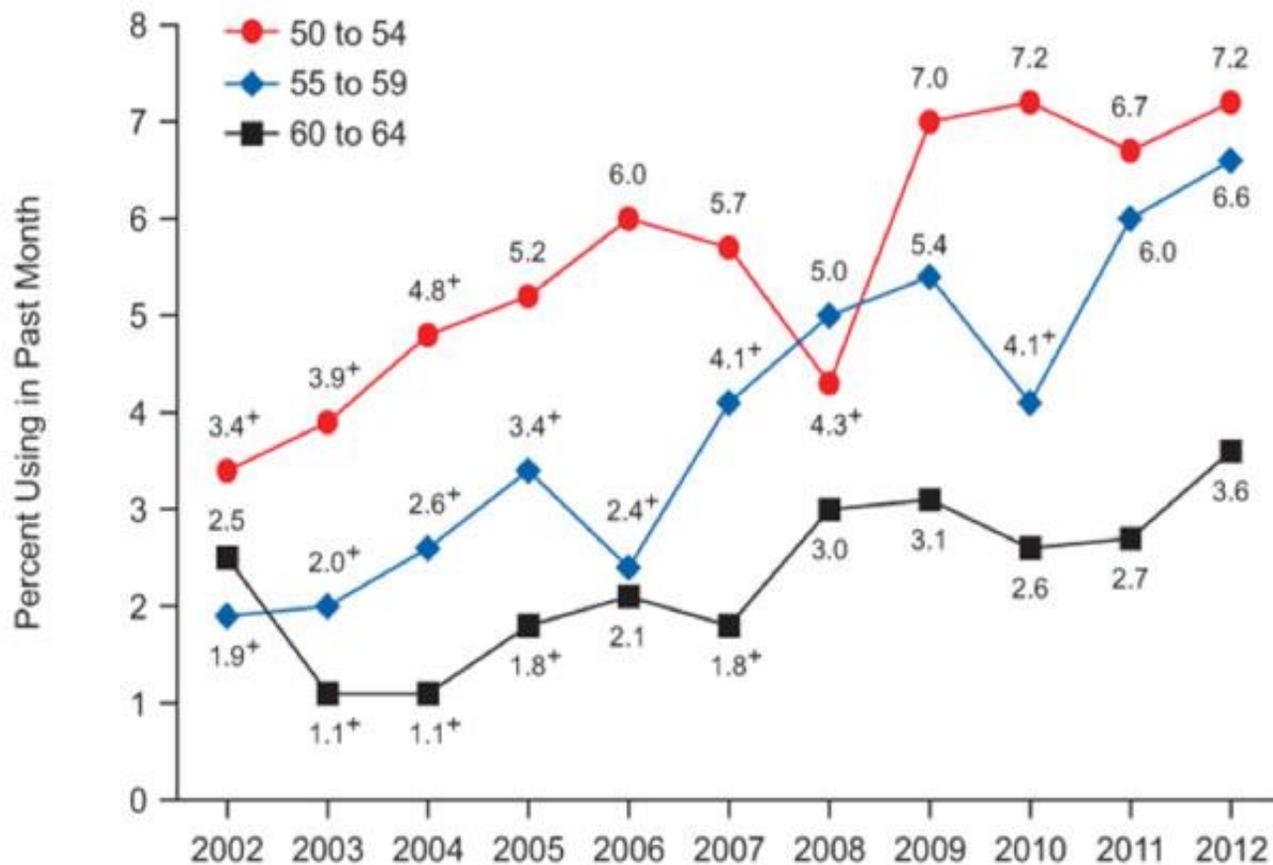
- 10% in the past 10 years

Drug abuse trends by age

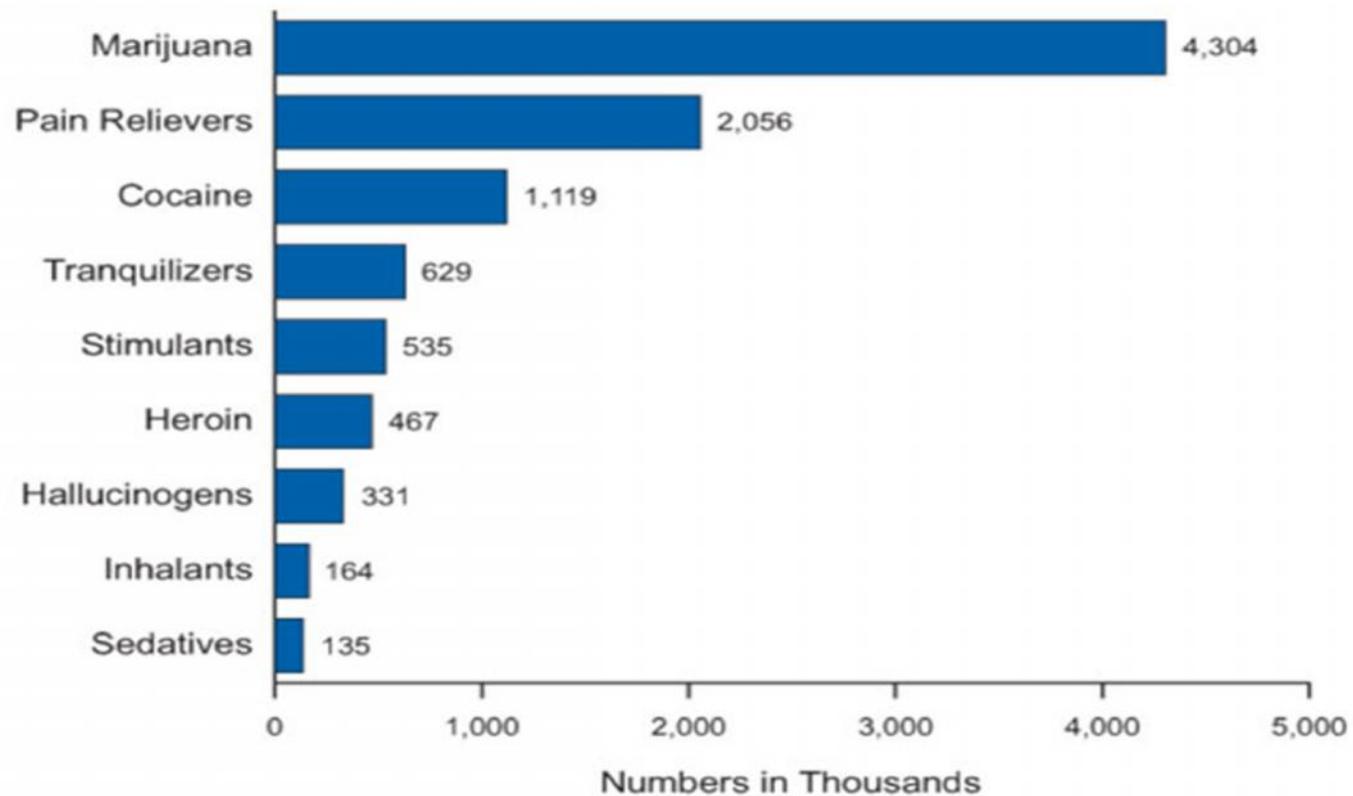


- Drug use is highest among people in their late teens and twenties
- Drug use is increasing among people in their fifties

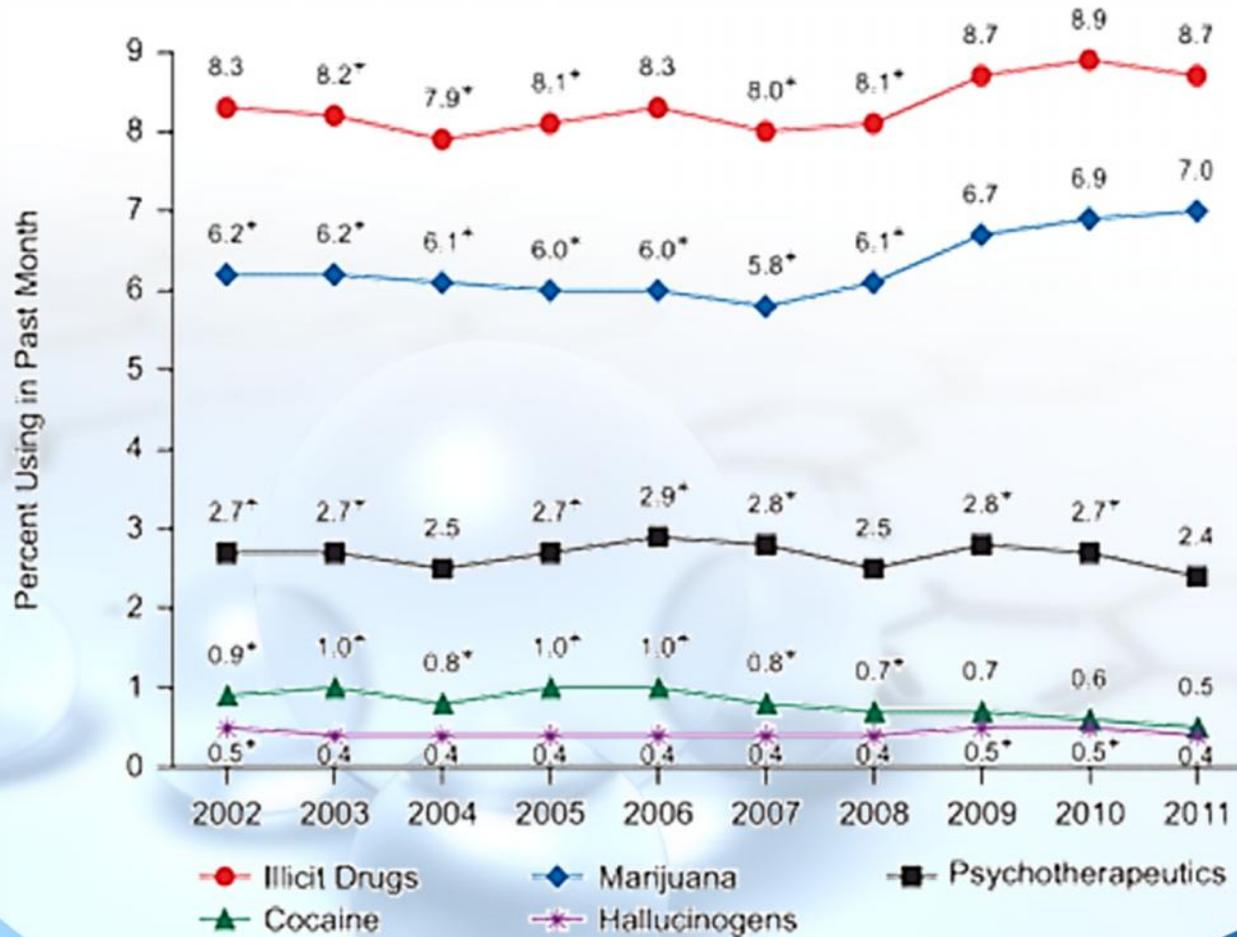
Drug use is increasing among people in their fifties



After alcohol, marijuana has the highest rate of dependence or abuse among all drugs

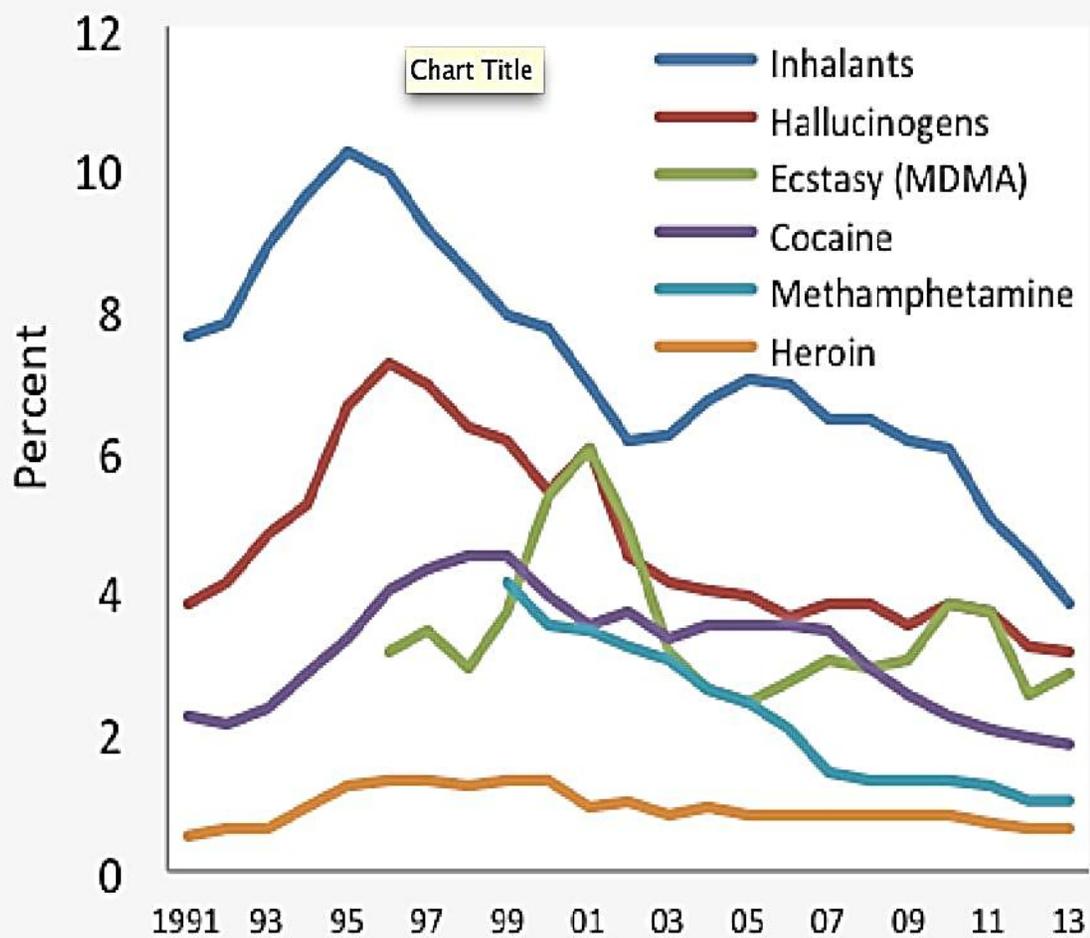


Marijuana use has increased since 2007



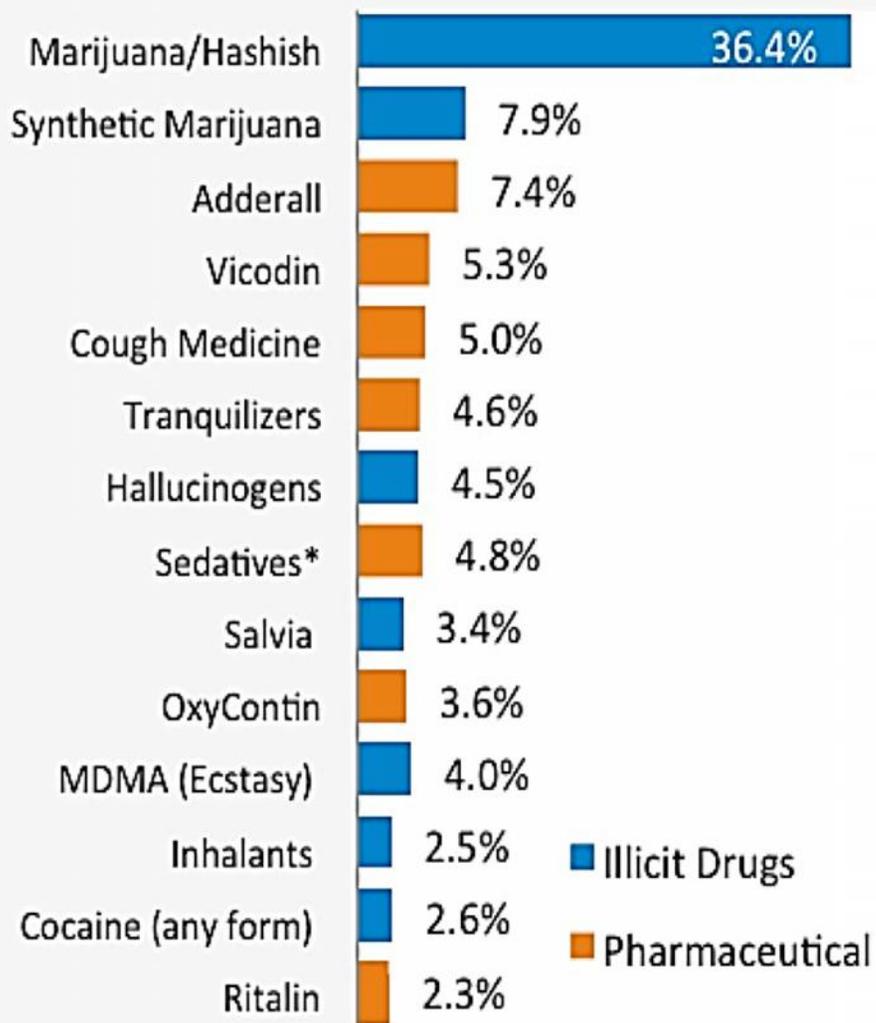
- Use of most drugs other than marijuana has not changed appreciably over the past decade or has declined
- Most people use drugs for the first time when they are teenagers

Past-Year Use of Various Drugs (All Grades Combined), 1991–2013



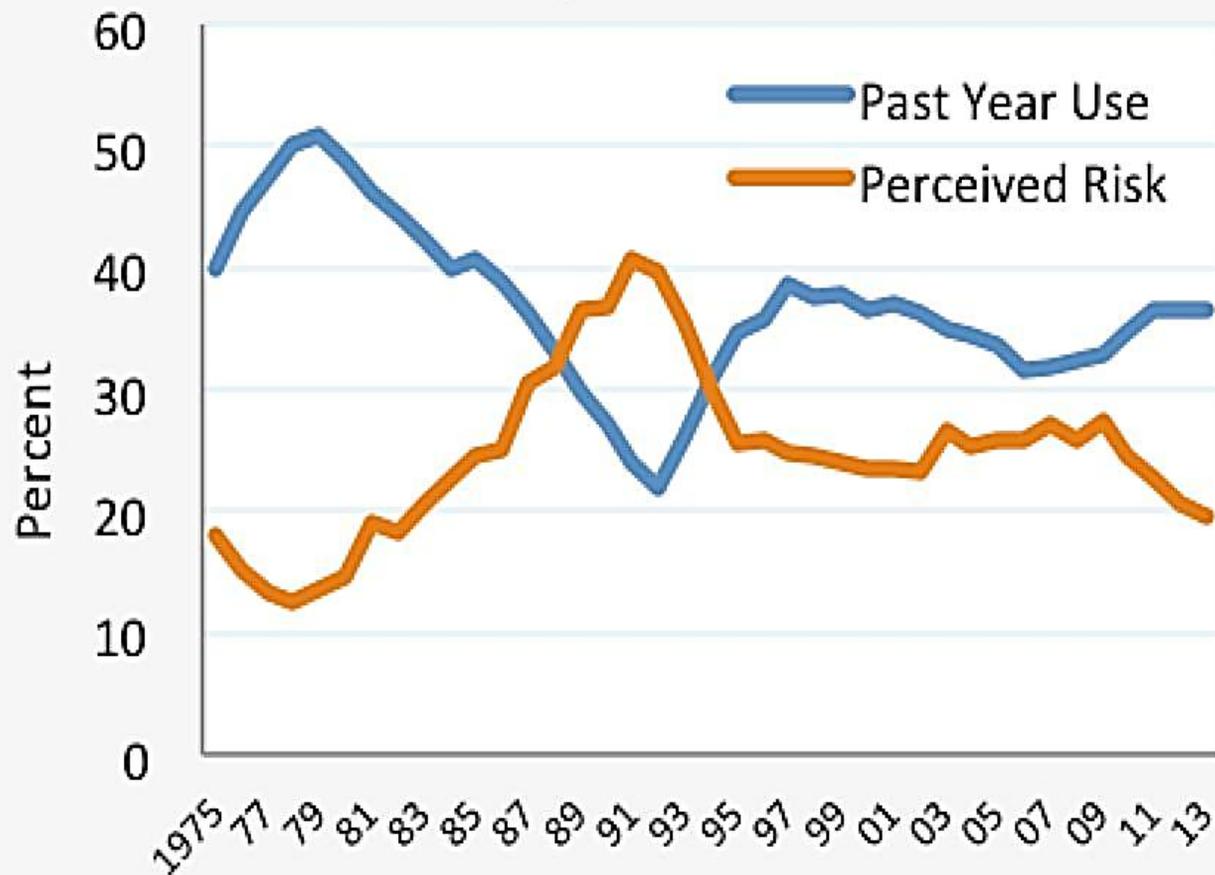
SOURCE: University of Michigan, 2013 Monitoring the Future Study

Past-Year Use of Various Drugs by 12th Graders (Percent)



SOURCE: University of Michigan, 2013 Monitoring the Future Study

Marijuana Perceived Risk vs. Past Year Use by 12th Graders



SOURCE: University of Michigan, 2013 Monitoring the Future Study

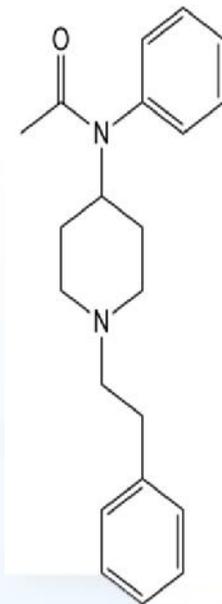
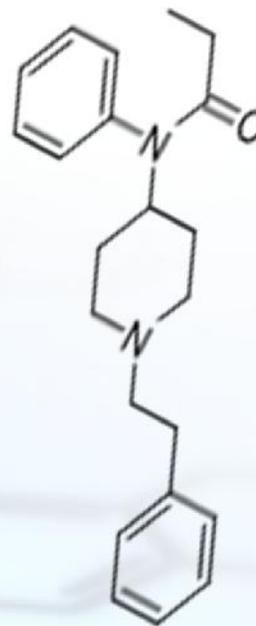
Of more recent concern.....

- Acetyl fentanyl
- Krokodil
- Kratom
- N-Bomb, 2-CE, Smiles, Bath Salts
- Piperazines
- "Syrup", "Purple Drank", "Sizzurp", "LEAN"
- Synthetic Cannabinoids
- Today's marijuana

CDC Issues Alert On Deadly New Designer Drug, Acetyl Fentanyl



A highly-potent designer drug based on the beneficial pain killer fentanyl has been implicated in dozens of U.S. drug overdose deaths (Photo credit: Wikipedia)



Acetyl fentanyl

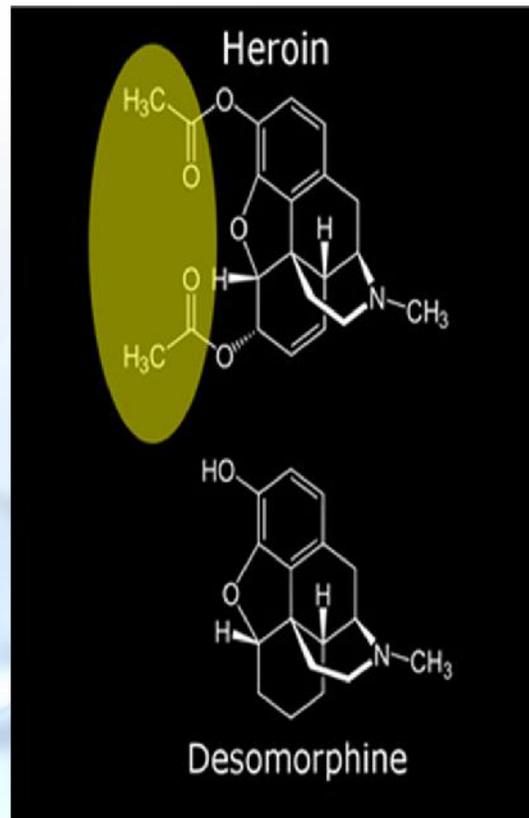
- Synthetic analogue of fentanyl
- 40X more potent than heroin
- 80X morphine
- mu-opioid receptor agonist (same as heroin)
- In Rhode Island there were 14 fatalities between 3/13 and 5/13
- Ages 19-57
- Pennsylvania: analysis confirmed 50 directly related fatalities and 5 non-fatal overdoses
- CDC Issued a health alert to all laboratories

Krokodil



Krokodil

Desmethyilmorphine:



Krokodil

- Deso-morphine
- 8-10X more potent than morphine
- Patented in 1932
- Permonid (Switzerland)
- Clandestine labs
- Can be easily made from Codeine, iodine and red sulfur
- Flesh eating impurities: effects in chronic use
- Proliferated in Russia when heroin became unavailable
- Half the price of heroin

Krokodil

Flesh-eating 'zombie' drug 'kills you from the inside out'

By Jen Christensen, CNN, updated 7:48 AM EDT, Fri October 18, 2013

- Has been seen in ER's in the USA
- Utah
- Arizona
- Illinois
- Not believed to be widespread in the US



2C-x Chemical Family

MDMA, 2C-x, Tryptamines, Phenethylamines

Alexander Shulgin

Medicinal chemist, pharmacologist

“Godfather of Psychedelics”

PiHKAL “a chemical love story” 1991

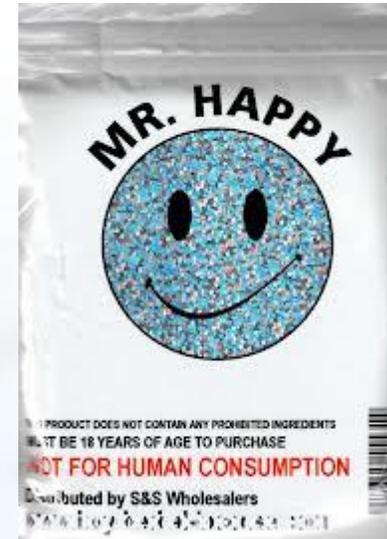
TiHKAL “the continuation” 1997

Cookbooks



2C-x Chemical Family

- “2C”: Two carbons between benzene ring and the amino group.
- At least 25 are known
- “new Ecstasy”
- Psychedelic phenethylamines

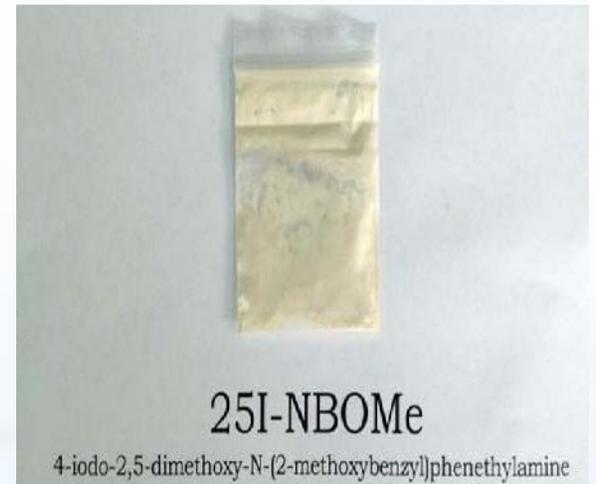
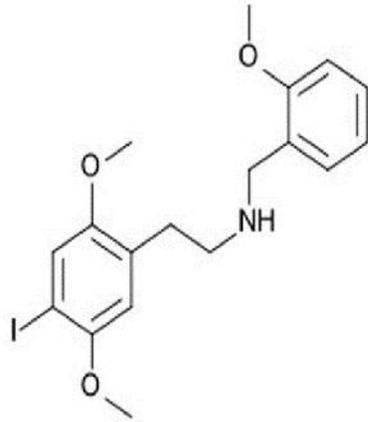


2C-x Chemical Family

- Euphoria
- auditory and visual hallucinations
- giddiness
- relaxation
- empathy
- “bad trips,” which include terrifying hallucinations and feelings of fear and panic

N-Bomb

- 25I
- Smiles
- NBOMe
- Stimulant
- Hallucinogen
- Acts much like LSD
- 5-HT₂ receptor
- (X16 other 2C's)
- Psychedelic



N-Bomb

- Discovered in 2003
- Emerged as a recreational drug in 2010
- Inactive orally
- SL, buccal and nasal
- Dose: 600-1200 ug
- Several deaths reported in 2013
- Temporary Schedule 1 in the USA: 11/15/2013

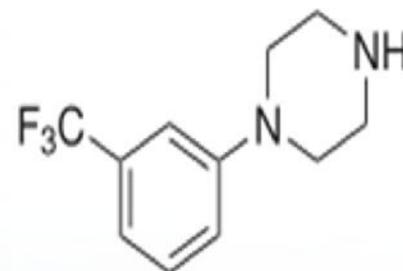
Drug 'Molly' is taking a party toll in the United States

- Stimulant sold in tablet form
- By definition: pure form of ecstasy
- "Molly" made popular through celebrity references:
 - Madonna, Kanye West and Miley Cyrus
- Is typically found to not be XTC
- TFMPP, methyldone, MPV, etc. but rather any of several designer drugs
- Because of the "alleged purity"
- it is thought to be less dangerous.....



TFMPP

- Piperazine chemical class
- Trifluoromethylphenylpiperazine
- 5HT receptor activity
- Weak on 5HT2
- Combined with BZP (benzylpiperazine)
- Provides an XTC-like affect
- Some scheduling in New Zealand, UK and Japan (illegal)
- Not scheduled in the USA



Other piperazines...

Table 3

Common piperazines and chemical names

Abbreviated name	Chemical name
BZP	1-Benzylpiperazine
CPP	1-(3-Chlorophenyl)piperazine
MBZP	1-Methyl-4-benzylpiperazine
MEBP	<i>N</i> -(3-methylbenzyl)piperazine
MeOPP	1-(2-Methoxy-phenyl)piperazine
MeP	1-Methyl-3-phenylpiperazine
TMFPP	1-(3-Trifluoromethylphenyl)piperazine

[J Med Toxicol. 2012 March; 8\(1\): 15–32.](#)

Published online 2012 January 25. doi: 10.1007/s13181-011-0202-2

Amphetamine analogues

- [2-Fluoroamphetamine](#) (2-FA)
- [3-Fluoroamphetamine](#) (3-FA)
- [4-Fluoromethamphetamine](#) (4-FMA)
- [4-Fluoromethcathinone](#) (4-FMC)
- [*para*-Bromoamphetamine](#) (PBA)

Kratom

- *Mitragyna speciosa*
- Uses the leaves of the plant
- Native to SE Asia
- Low dose: stimulant properties
- High dose: opiate like properties
- Binds to mu opiate receptor
- Has been used in herbal medicine as a treatment for opiate withdrawal
- Illegal in SE Asia.
- Legal in USA and all of Europe



Asian leaf 'kratom' making presence felt in US emergency rooms



A drug user in Thailand breaks up kratom leaf into a pan in the process of creating a popular cheap narcotic drink called 4x100. It is one way that the traditional herb kratom, which is now illegal in Thailand, is used recreationally.

Paula Bronstein / Getty Images file

...widely available

- **Kratom Capsules**
- 100% Organic
- Natural Prescription Alternative
- #1 Herbal Pain Killer and Stress Reducer



Cough syrup



- “Syrup”, “Purple Drank”, “Sizzurp”, “Lean”
- Prescription cough syrup (codeine and promethazine) mixed with soda, jolly rancher.
- Consumed out of a Styrofoam cup until euphoria & dissociation from one’s body occur.
- Lasts 3-6 hours
- Started in Houston and is somewhat prevalent in the SE USA.
- ER visits due to Opiate/promethazine overdose

Cough syrup



Effects of Purple Drank include:

- Constricted pupils that do not respond well to light
- Rough, raspy voice
- Slow, slurred speech
- Uncontrolled eye movement
- Droopy eyes
- Slowed heart rate
- Drowsiness
- Loss of balance
- Loss of coordination
- Paleness

Synthetic cannabinoids

- K2 and Spice, etc.
- Bind to cannabinoid receptors.
- Up to 800X THC
- Mild euphoria to hyperventilation, paranoia, hallucinations, vomiting and seizures
- Physiologic effects, All the usual signs of intoxication plus red eyes, pupil dilation, elevated HR and BP
- Highly metabolized
- Unstable at RT in solution
- Limited immunoassay
- LCMSMS at amounts of 0.5 ng/mL or less



Synthetic cannabinoids

- The most recent synthetic cannabinoids emerging as drugs of abuse include PB-22, 5F-PB-22, AB- FUBINACA, and ADB-PINACA. These four synthetic cannabinoids, along with UR-144, XLR11 and AKB-48, are proposed for scheduling and have been scheduled in some states.
- Section 1152 of FDASIA amended the CSA by placing cannabimimetic agents and 26 specific substances (including 15 synthetic cannabinoids, 2 synthetic cathinones, and 9 synthetic phenethylamines of the 2C- series) in Schedule I.

Synthetic cannabinoids

Table 1

Brand names of common HMAs [16]

Spice	Chill zone cherry	Chaos mint
K2	Chill zone mint	Chaos original
Tai fun blackberry	Chill zone original	Chaos cherry
Tai fun vanilla	Chill out cherry	Smoke
Tai fun orange	Chill out mint	Clover Spring
Exclusive original	Chill out original	Aztec thunder
Exclusive mint	Sensation vanilla	Red Merkury
Exclusive cherry	Sensation orange	Zen
Natures organic jagoda (blackberry)	Sensation blackberry	Zen ultra
Natures organic wisnia (cherry)	Sensation vanilla 2	
Natures organic truskawka (strawberry)	Sensation blackberry 2	

[J Med Toxicol. 2012 March; 8\(1\): 15-32.](#)

Published online 2012 January 25. doi: 10.1007/s13181-011-0202-2

Hot off the press.....

DEPARTMENT OF JUSTICE
Drug Enforcement Administration

[21 CFR Part 1308](#)

[Docket No. DEA-386]

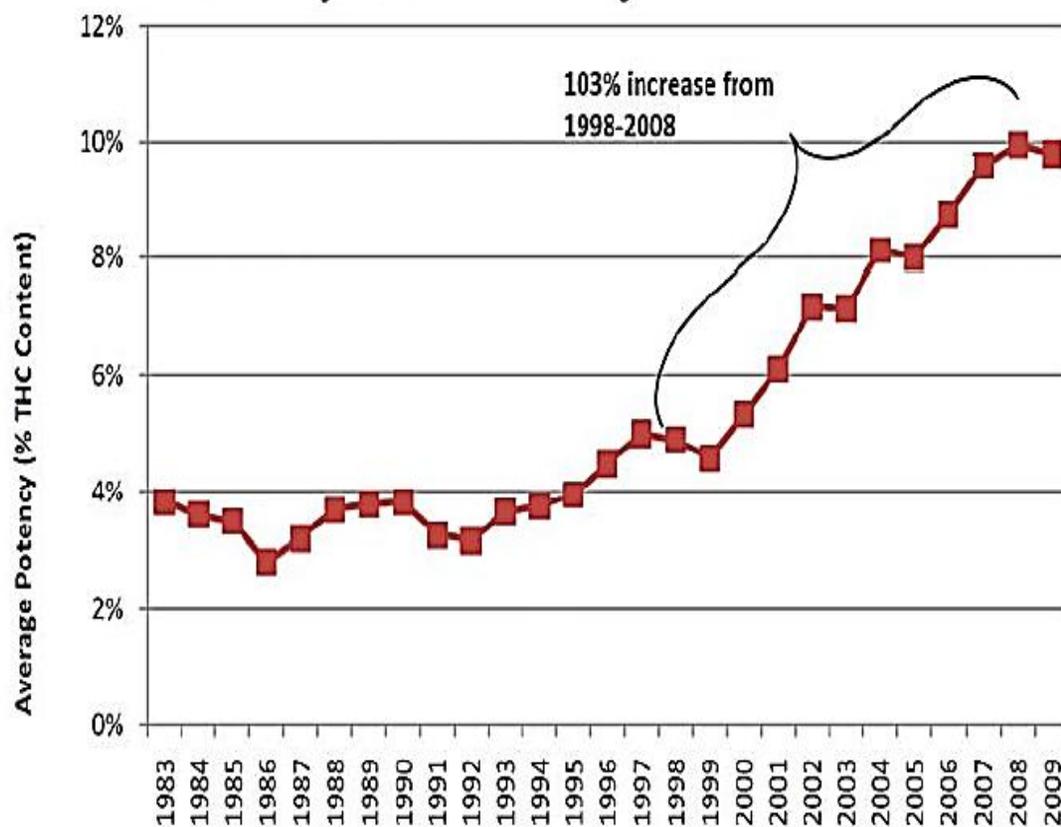
Schedules of Controlled Substances: Temporary
Placement of 10 Synthetic Cathinones into
Schedule I

AGENCY: Drug Enforcement Administration,
Department of Justice.

ACTION: Notice of Intent.

January 28th 2014

Potency of Seized Marijuana in the U.S.



Source: University of Mississippi, National Center for Natural Products Research, *Potency Monitoring Project Quarterly Report 107 (January 2010)*

News

Study: Fatal Car Crashes Involving Marijuana Have Tripled

February 4, 2014 9:14 PM



SEATTLE (CBS Seattle) – According to a recent study, fatal car crashes involving pot use have tripled in the U.S.

“Currently, one of nine drivers involved in fatal crashes would test positive for marijuana,” Dr. Guohua Li, director of the Center for Injury Epidemiology and Prevention at Columbia, and co-author of the study told HealthDay News.



Study Claims to Find First Two Deaths Caused by Marijuana

• [Laura Stampler@LauraStampler](mailto:LauraStampler@LauraStampler)

Feb. 27, 2014

Cuts against many other studies that have showed pot doesn't have fatal health implications

A recent German study claims to have documented the first known deaths resulting from marijuana use



Medical Marijuana

Background and highlights.



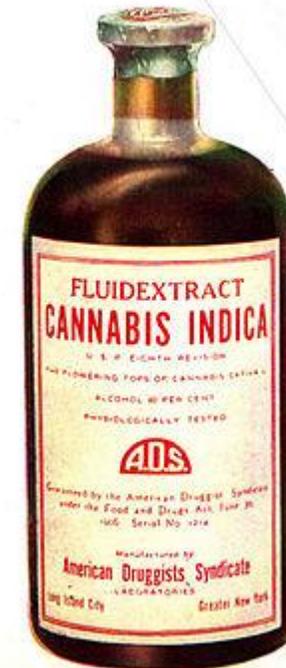


The [Ebers Papyrus](#) (ca. 1550 BCE) from Ancient Egypt has a prescription for medical marijuana



大麻

The use of cannabis, at least as fiber, has been shown to go back at least 10,000 years in [Taiwan](#)



CANNABIS AMERICANA
U. S. P.
Physiologically Tested

OUR American variety is the answer to the question which has so long troubled manufacturers. With our material a finished product can be turned out at a reasonable cost.



IT is no longer necessary to depend on the foreign variety which is of high cost and slightly superior. The uncertainty of further supplies of it is another factor favoring the American product.

J. L. HOPKINS & CO., 100 William St., New York

ST ANTHONY HOSPITAL & PHARMACY 603 N W 9TH ST OKLA CITY, OKLA 73102		23 0657693	212982
Class of tax		Registration Number 73-1142-7/4/5	This is a tax receipt—not a license
3/4/5	Period beginning July 1, 1933 to:	RETURN NUMBER 3- 735781/561200	EXPIRES JUNE 30, 1937
Address of tax- payer	Address of tax- collector	Total	4.00
ISSUED BY INTERNAL REVENUE SERVICE OFFICE AT SWSC, AUSTIN, TEXAS			

UNITED STATES SPECIAL TAX STAMP INTERNAL REVENUE
OPIMUM, COCA LEAVES, MARIJUANA, ETC.
 KEEP THIS STAMP POSTED



The Four Perforate Stamps of the historic first issue (MA732)

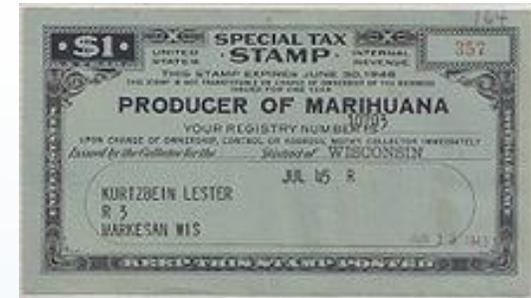
\$100 stamp comes with attached Receipt Tab



Marijuana Tax Act of 1937

After a lurid national propaganda campaign against the "evil weed," Congress passed the Marijuana Tax Act. The statute effectively criminalized marijuana, restricting possession of the drug to individuals who paid an excise tax for certain authorized medical and industrial uses.

Source: <<http://www.pbs.org/wgbh/pages/frontline/shows/dope/etc/cron.html>>

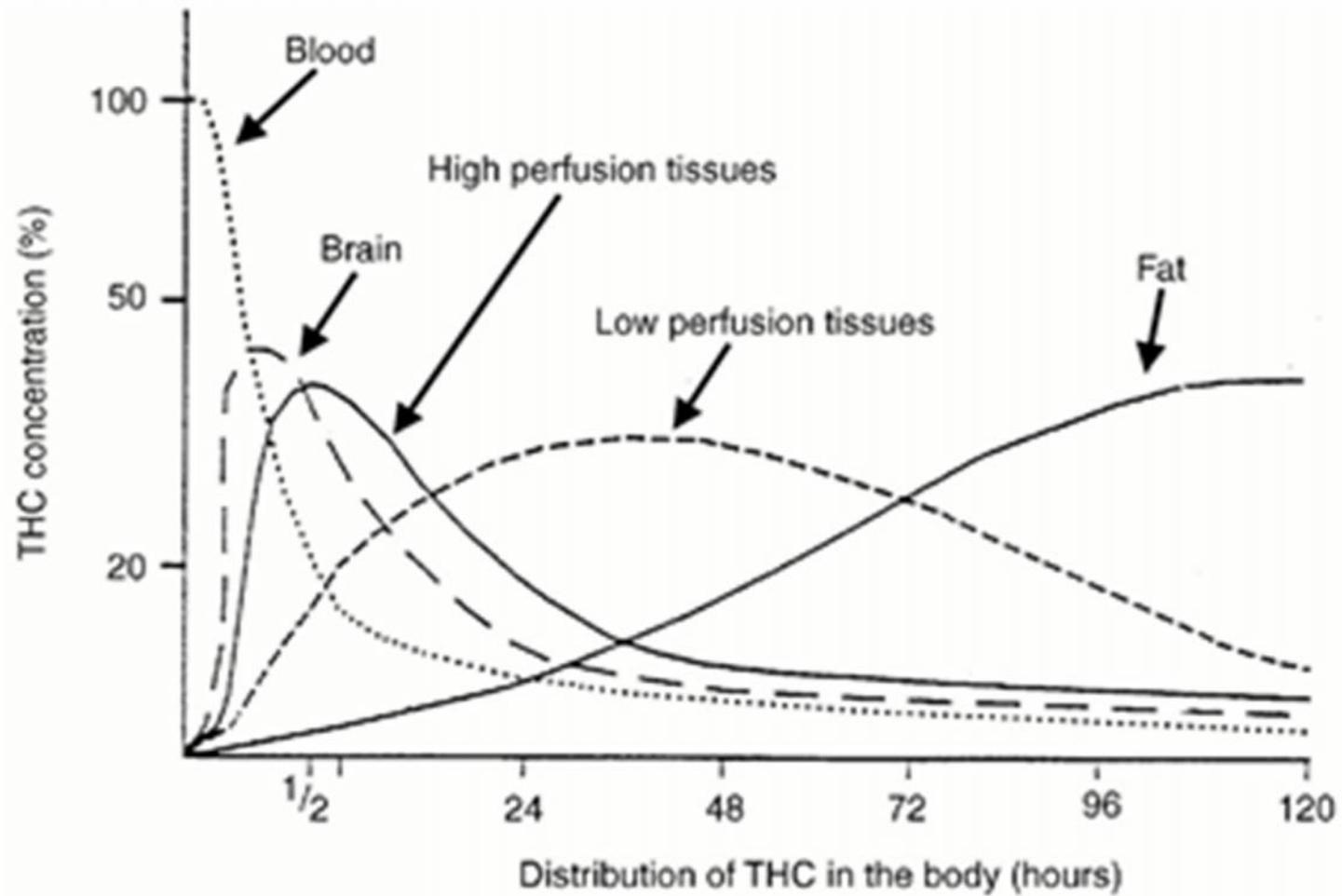


Marijuana

- Recreational
- Medicinal
- Cannabis Sativa
- Cannabis Indica
- Cannabis Ruderalis
- A majority, or 52 percent, of Americans favor legalizing marijuana use

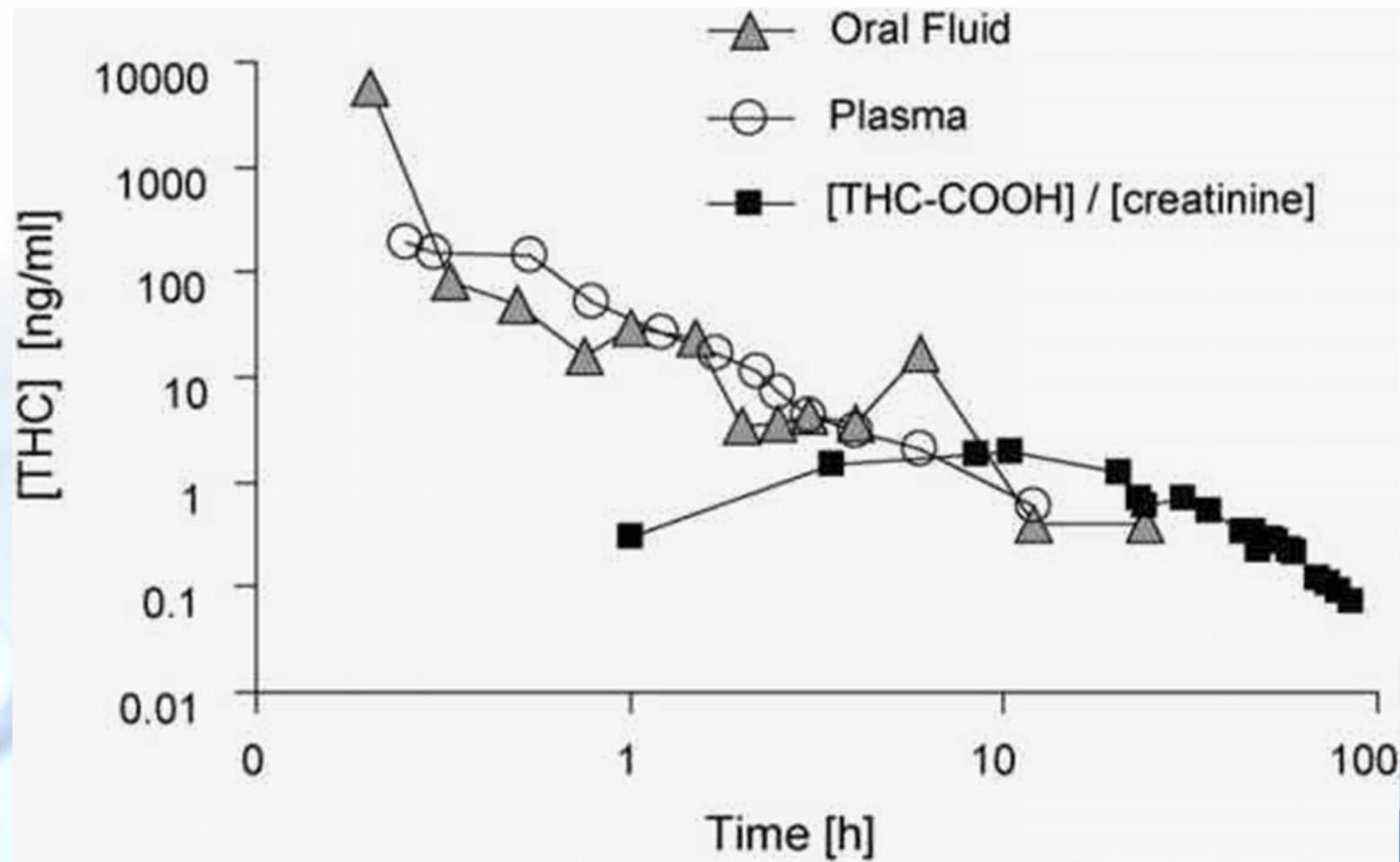


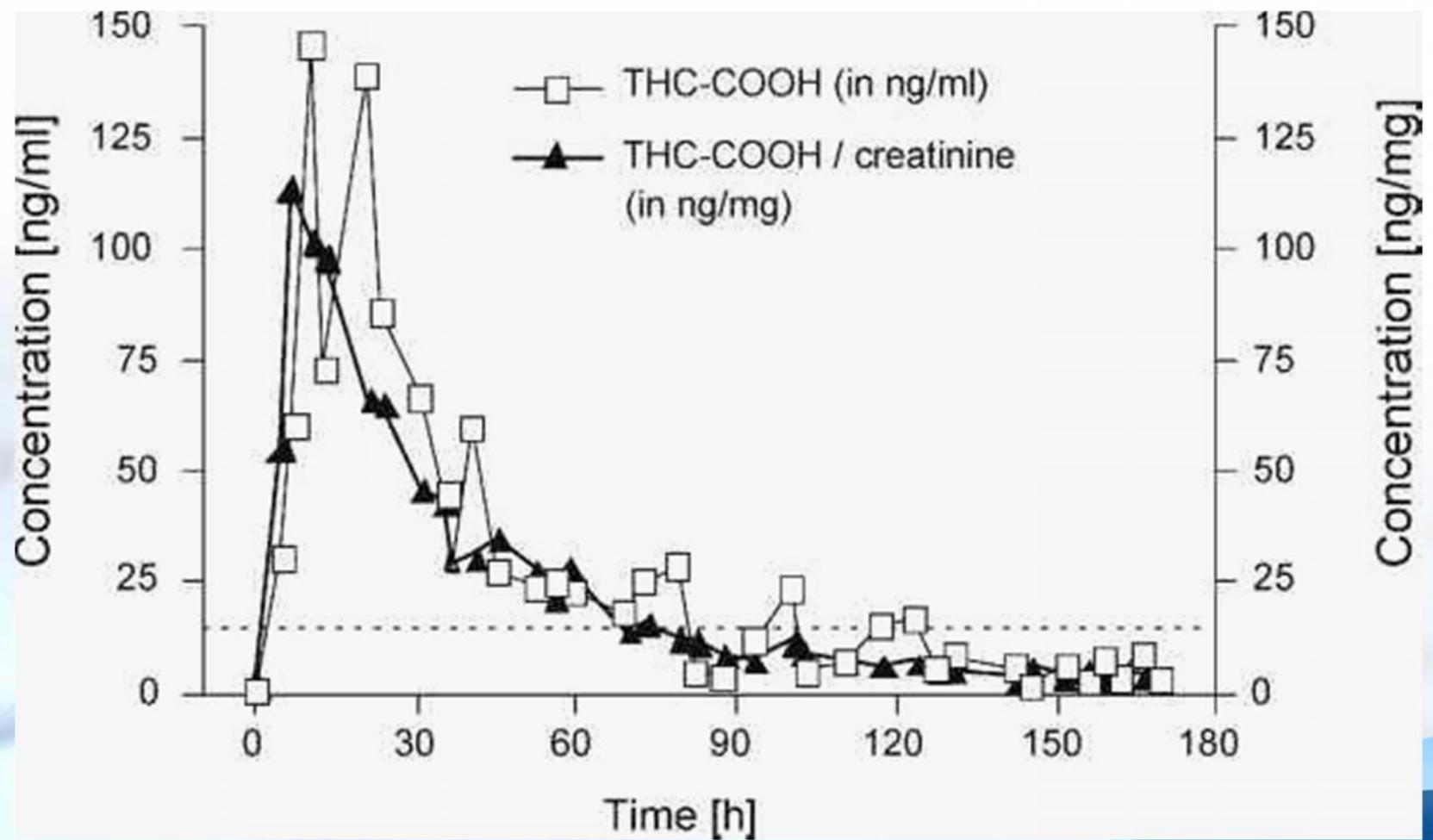
Distribution of THC in the body.



ASHTON C H BJP 2001;178:101-108

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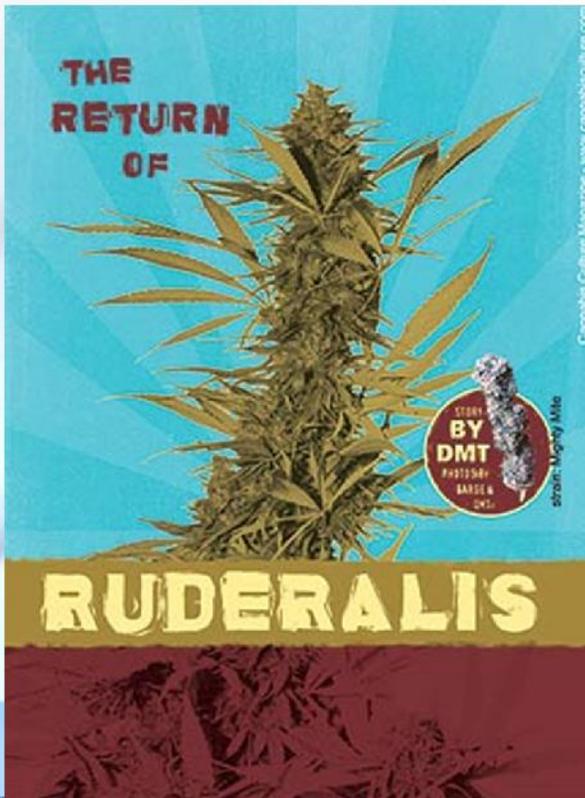




Cannabis indica



Cannabis sativa



Biological Classifications of Marijuana

Per the U.S. Dept of Agriculture, Feb. 15, 2007

Category	Latin Name	Common Name
Kingdom	Plantae	Plants
Subkingdom	Tracheobionta	Vascular plants
Superdivision	Spermatophyta	Seed plants
Division	Magnoliophyta	Flowering plants
Class	Magnoliopsida	Dicotyledons
Subclass	Hamamelididae	None
Order	Urticales	None
Family	Cannabaceae	Hemp Family
Genus	Cannabis L.	Hemp
Species	Cannabis sativa L.	Marijuana
Subspecies	Cannabis sativa L. ssp. Sativa	Marijuana / sativa
Subspecies	Cannabis sativa L. ssp. Indica	Marijuana / indica
Variety	Cannabis sativa L. ssp. Sativa var. spontanea	marijuana

Types Of Weed



SATIVA

Cannabis Sativa Sativa is characterized by leaflets that are more narrow, branches that are farther apart, and coloration that tends more toward spring green. Sativa Sativa plants tend to be taller and produce fewer flowers.



INDICA

Cannabis Sativa Indica is characterized by broad leaflets that offer overlap, branches that are closer together, and coloration that tends more toward deep olive green. Sativa Indica plants tend to be shorter and bushier, producing fuller, denser flower buds.



RUDERALIS

Cannabis Ruderalis is characterized by varied leaflets in the mature leaves, a shorter stature and generally small size. This subspecies is used to create S. Sativa or S. Indica hybrids with select desired traits.

www.Types-of-Weed.ORG

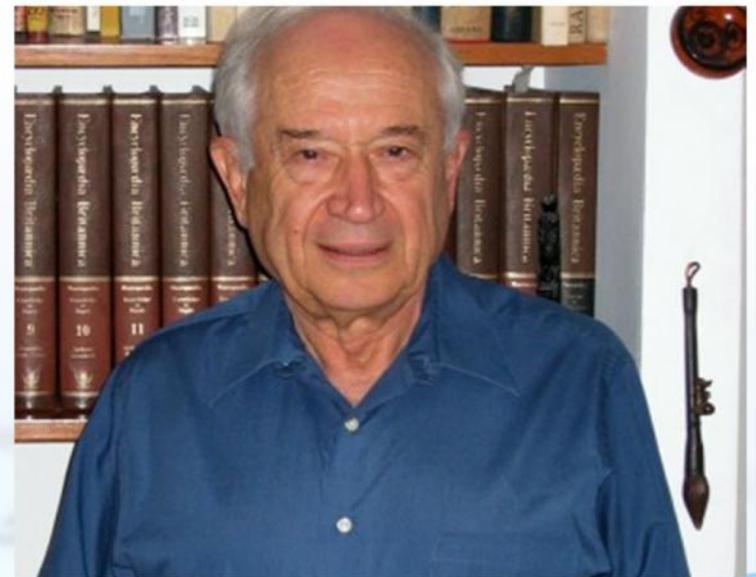
Professor Raphael Mechoulam, The Father Of Marijuana Research, Talks About His Studies And Breaking The Law In The Name Of Science

September 24, 2013

Professor Mechoulam has devoted his life to investigating the chemical constituents of marijuana. By 1963, Mechoulam and colleague Yuval Shvo, established the structure of Cannabidiol (CBD), an important component of Marijuana. CBD had been previously isolated, yet little was known about its structure.

A year later, Mechoulam and Yehiel Gaoni isolated Δ^9 -tetrahydrocannabinol (THC), the psychoactive ingredient in marijuana, for the very first time. They continued to elucidate the structure and synthesise THC. Over the next years, Mechoulam and Dr. Habib Ederly proceeded to synthesize other major compounds from the cannabis plant.

<http://nocamels.com/2013/09>



1960s, Israel: Dr. Raphael Mechoulam identifies THC as the psychoactive compound in marijuana.

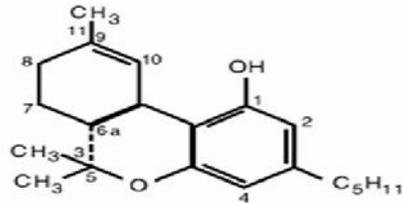
<http://cannabishowmagazine.com/cannabis/in-history/a-tale-of-two-nations-while-cannabis-science-progresses-abroad-american-politicians-still-skeptical>

What's in a plant ? :

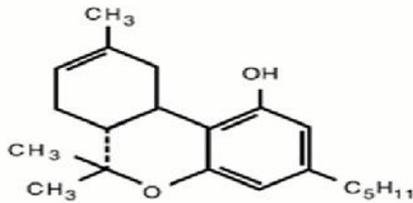
There are more than 480 natural components found within the cannabis plant, of which 66 have been classified as "**cannabinoids**." Those are chemicals unique to the plant, including delta-9-tetrahydrocannabinol and cannabidiols. There are, however, many more, including:

- Cannabigerols (CBG);
- Cannabichromenes (CBS);
- Other Cannabidiols (CBD);
- Other Tetrahydrocannabinols (THC);
- Cannabinols (CBS) and Cannabinodiol (CBDL);
- Other cannabinoids (such as cannabicyclol (CBL), cannabielsoin (CBE), cannabitriol (CBT) and other miscellaneous types).

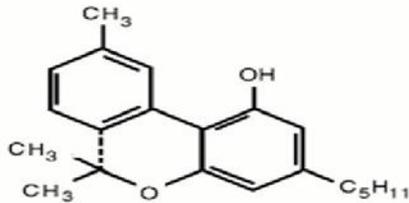
Chemical structure of main cannabinoids in Cannabis sativa.



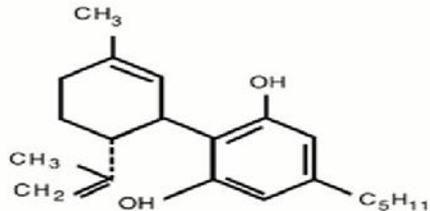
Delta-9-tetrahydrocannabinol



Delta-8-tetrahydrocannabinol



Cannabinol (CBN)

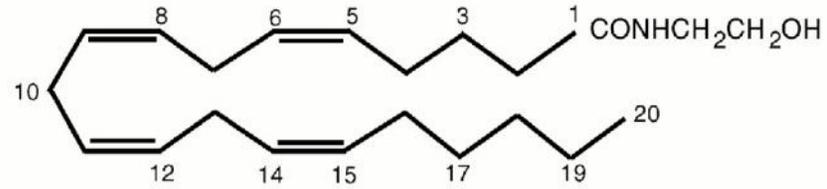


Cannabidiol (CBD)

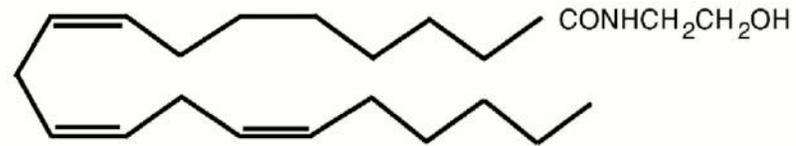
ASHTON C H BJP 2001;178:101-106

THE BRITISH JOURNAL
OF PSYCHIATRY

Chemical structure of anandamides.



Arachidonyl ethanolamide
Anandamide (20:4, n-6)



Homo-γ-linolenylethanolamide
Anandamide (20:3, n-6)

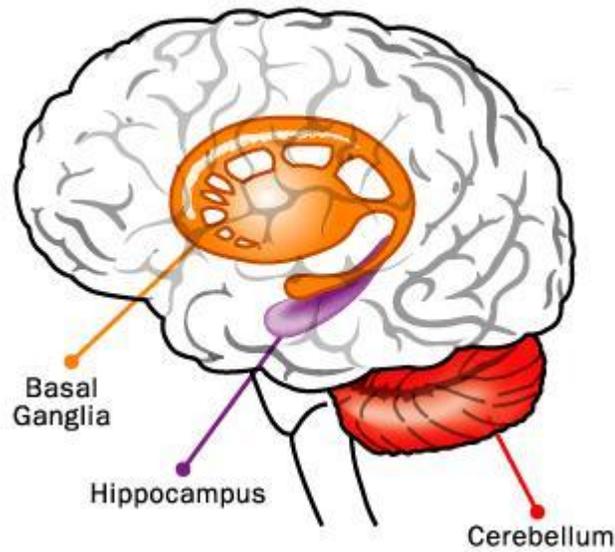


7,10,13,16-Docosatetraenylethanolamide
Anandamide (22:4, n-6)

ASHTON C H BJP 2001;178:101-106

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Cannabinoid Receptor Sites



©2001 HowStuffWorks

Brain's Chemical

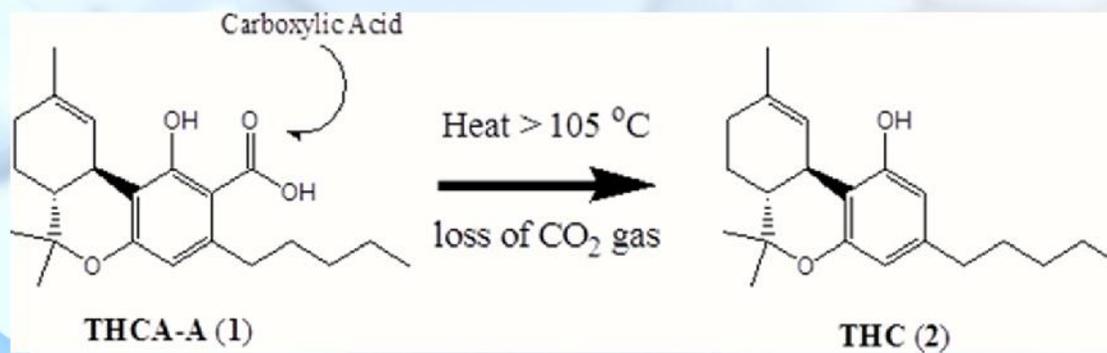


Anandamide

Drug



THC





UN FÁRMACO A BASE DE CANNABIS

SATIVEX

- Medicamento que se comercializa en Canadá
- Extracto puro de cannabis
- Pulverización sublingual

COMPONENTES ACTIVOS POR DOSIS

2,7 mg tetrahidrocannabinol (THC)

2,5 mg cannabidiol (CBD)

5 % Otros cannabinoides

EL ENSAYO

207 PACIENTES HAN PARTICIPADO DURANTE UN AÑO

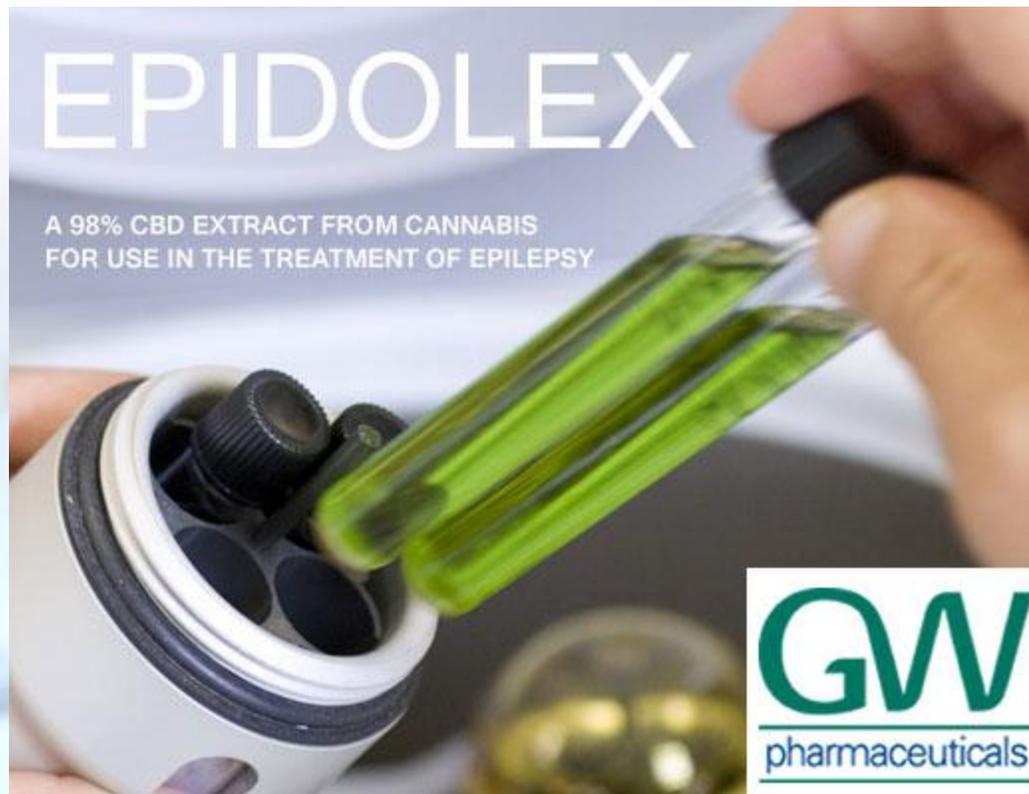
Resultado antes y después del tratamiento

- NAUSEAS Y VÓMITOS POR QUIMIOTERAPIA TRAS EL TRATAMIENTO
 - MENOS NAUSEAS: 67,0%
 - MENOS VÓMITOS: 51,9%
- ESPASMOS FRECUENTES POR ESCLEROSIS MÚLTIPLE
 - ANTES: 67,9%
 - DESPUES: 51,9%
- MANIFIESTA EN ENFERMOS DE SIDA
 - ANTES: 83,3%
 - DESPUES: 25,0%
- DOLOR NEUROPÁTICO INTENSO O INTOLERABLE (ESCLEROSIS MÚLTIPLE)
 - ANTES: 65,9%
 - DESPUES: 35,0%

Fuente: Consultorio de Salud de la Universidad



New drug Epidiolex by GW Pharmaceuticals gets FDA clinical trial approval for pediatric epilepsy



GW Pharmaceuticals; the company responsible for manufacturing Sativex, the cannabis extract in a spray bottle marketed for MS spasticity and neuropathic pain patients – have not tried to keep it a secret that they have been working on many other forms of cannabis preparation.

Report of a parent survey of cannabidiol-enriched cannabis use in pediatric treatment-resistant epilepsy.



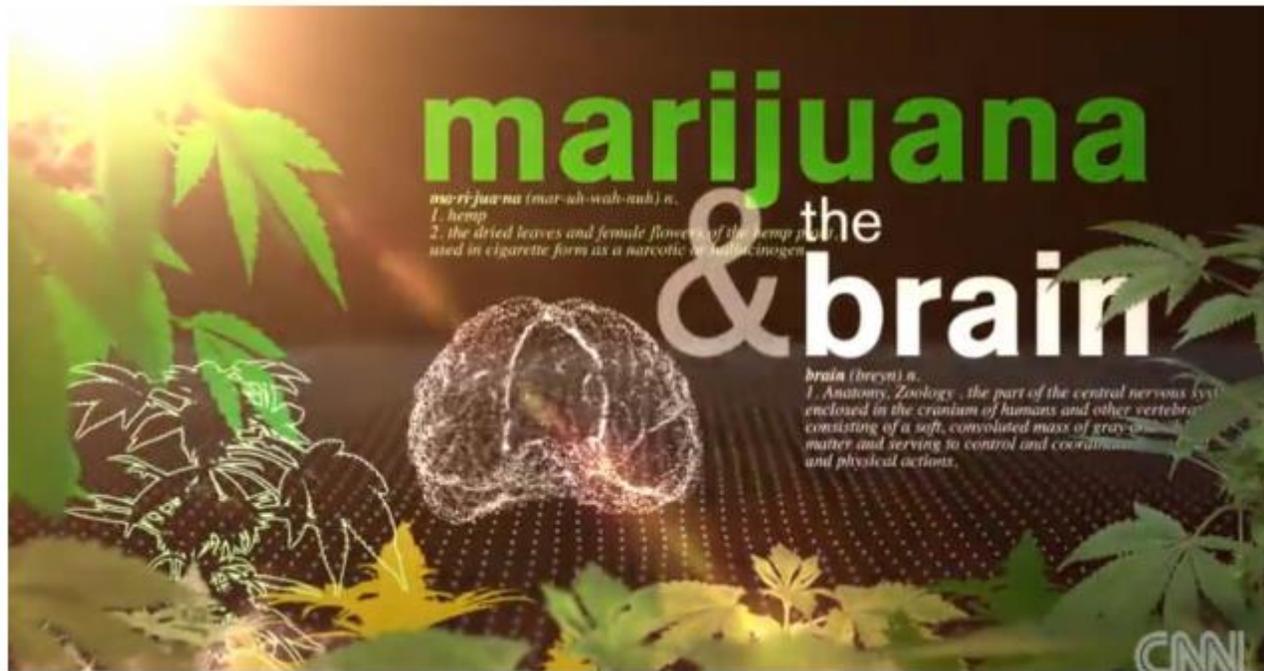
Severe childhood epilepsies are characterized by frequent seizures, neurodevelopmental delays, and impaired quality of life. In these treatment-resistant epilepsies, families often seek alternative treatments. This survey explored the use of cannabidiol-enriched cannabis in children with treatment-resistant epilepsy. The survey was presented to parents belonging to a Facebook group dedicated to sharing information about the use of cannabidiol-enriched cannabis to treat their child's seizures. Nineteen responses met the following inclusion criteria for the study: a diagnosis of epilepsy and current use of cannabidiol-enriched cannabis. Thirteen children had Dravet syndrome, four had Doose syndrome, and one each had Lennox-Gastaut syndrome and idiopathic epilepsy. **The average number of antiepileptic drugs (AEDs) tried before using cannabidiol-enriched cannabis was 12. Sixteen (84%) of the 19 parents reported a reduction in their child's seizure frequency while taking cannabidiol-enriched cannabis. Of these, two (11%) reported complete seizure freedom, eight (42%) reported a greater than 80% reduction in seizure frequency, and six (32%) reported a 25-60% seizure reduction. Other beneficial effects included increased alertness, better mood, and improved sleep.** Side effects included drowsiness and fatigue. Our survey shows that parents are using cannabidiol-enriched cannabis as a treatment for their children with treatment-resistant epilepsy. Because of the increasing number of states that allow access to medical cannabis, its use will likely be a growing concern for the epilepsy community. Safety and tolerability data for cannabidiol-enriched cannabis use among children are not available. Objective measurements of a standardized preparation of pure cannabidiol are needed to determine whether it is safe, well tolerated, and efficacious at controlling seizures in this pediatric population with difficult-to-treat seizures.

Source: <http://www.ncbi.nlm.nih.gov/pubmed/24237632>

Medical marijuana and 'the entourage effect'

By **Dr. Sanjay Gupta**, CNN chief medical correspondent
updated 1:58 PM EDT, Tue March 11, 2014

CNN Health



STORY HIGHLIGHTS

- Scientist Raphael Mechoulam has made studying marijuana his life's work
- There are more than 480 natural components in the cannabis plant
- "The entourage effect" means those components may work best together

Source: <http://www.cnn.com/2014/03/11/health/gupta-marijuana-entourage/index.html>

GW now occupies a world leading position in cannabinoid science. The Company has developed a proprietary and validated cannabinoid technology platform and formed constructive collaborations with leading international scientists, universities and institutions in the field.

Source: <http://www.gwpharm.com/therapeutic-areas.aspx>



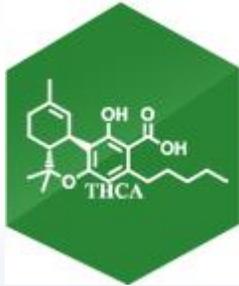
Increasingly, dispensaries and patients are turning to laboratories to evaluate plants.

- Some laboratories cater to medical-marijuana industry
- Using high-tech instruments, testers look for mold, bacteria and fungus, which can weaken patients' respiratory systems
- Most of the 21 states plus Washington, D.C., that have passed medical-marijuana laws don't require testing for pesticides or fertilizers.



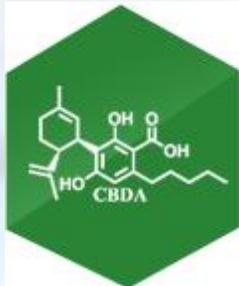
Source: <http://www.usatoday.com/story/news/nation/2014/01/06/medical-marijuana-purity-laboratories/4336123/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+UsatodaycomNation-TopStories+%28USATODAY++Nation+Top+Stories%29>

Cannabinoid Profiling Service



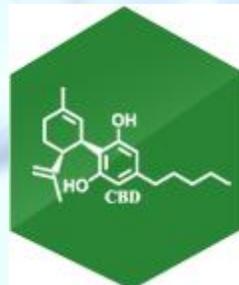
THCA – Δ9-Tetrahydrocannabinolic acid A

THCA was identified recently as a highly valuable anti-inflammatory agent. This chemical is only available when consumed orally and the plant has not been heated before consumption.



CBDA – Cannabidiolic acid

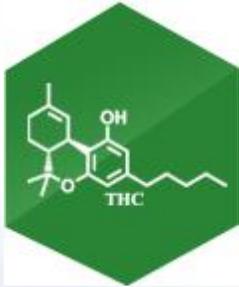
CBDA was identified recently as a highly potent anti-inflammatory agent. This chemical is only available when consumed orally and the plant has not been heated before consumption.



CBD – Cannabidiol

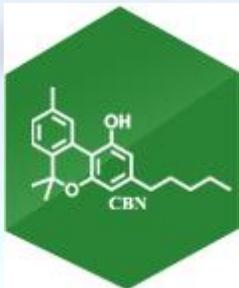
CBD has been shown to provide anti-convulsant, anti-arthritic and neuroprotective properties while not inducing any psychoactivity. CBD modulates the effects of THC to provide a non-psychoactive treatment alternative.

Cannabinoid Profiling Service



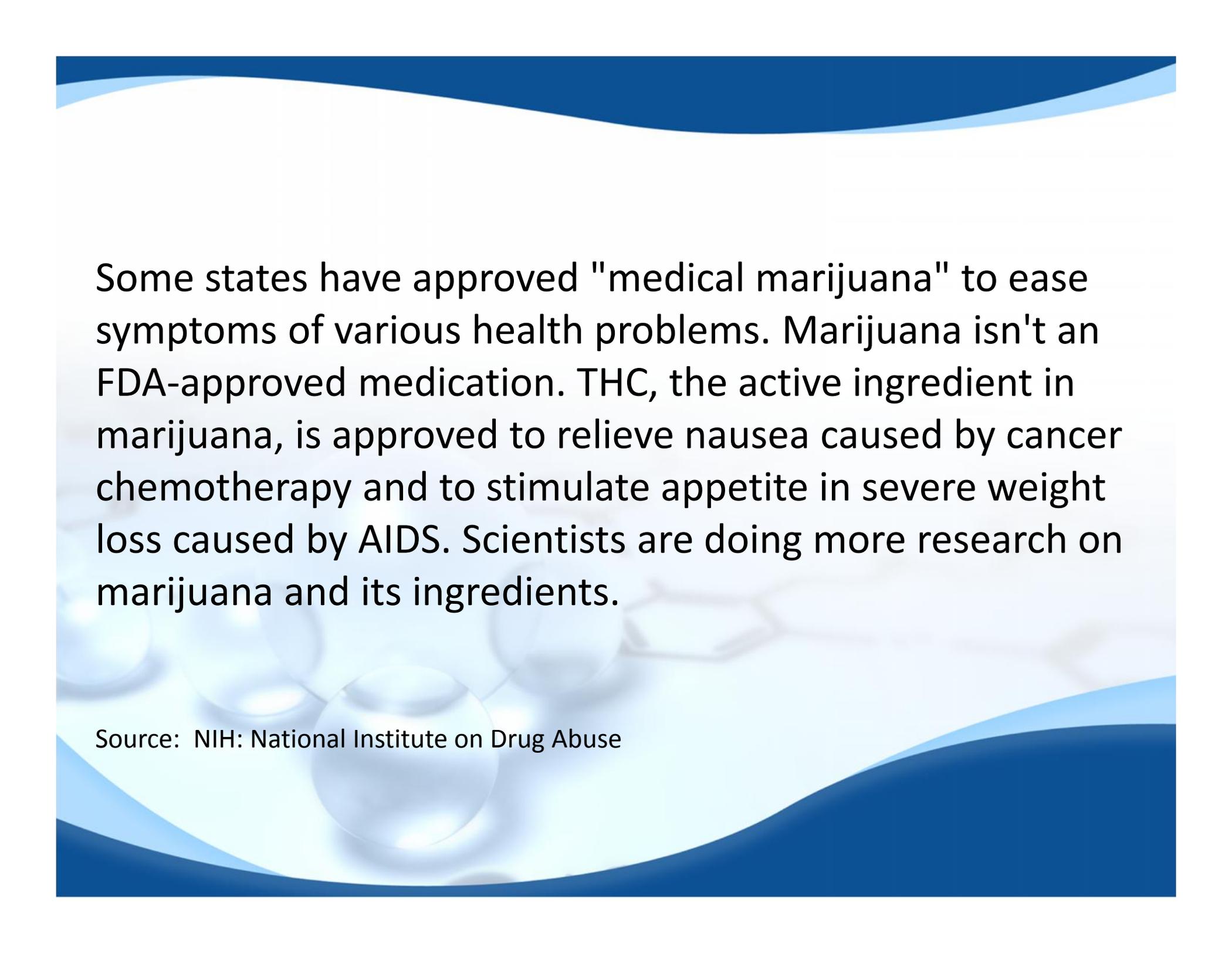
THCA – Δ9-Tetrahydrocannabinol

THC has been shown to provide relief for neuropathic pain, stimulates appetite and reduces vomiting associated with chemotherapy. THC can be useful to reduce inflammation and also offers neuroprotective effects. Patients should note THC can induce psychoactive, or cerebral, effects as well. Too much THC can cause unease, anxiety and overall discomfort.



CBN – Cannabinol

CBN is a degradative product of THC.

The background features a light blue gradient with a faint molecular structure of spheres and connecting lines. Darker blue wavy borders are present at the top and bottom of the slide.

Some states have approved "medical marijuana" to ease symptoms of various health problems. Marijuana isn't an FDA-approved medication. THC, the active ingredient in marijuana, is approved to relieve nausea caused by cancer chemotherapy and to stimulate appetite in severe weight loss caused by AIDS. Scientists are doing more research on marijuana and its ingredients.

Source: NIH: National Institute on Drug Abuse

NIDA funded research

- 28 projects as of March 2014
- 25 + 3 Supplemental
- Autoimmune Disease (1/0)
- Inflammation (2/0)
- Pain (6/2)
- Psychiatric Disorders (2/2)
- Seizures (1/0)
- SUD, Dependence and Withdrawal(13/9)

Recreational, Medical, Illegal: A State-by-State Guide to Cannabis



**New Mexico Medical Cannabis Program
(active status as of 7/31/2013)**

Qualifying condition	No. of Patients
PTSD	4068
Chronic pain	2773
Cancer	709
Painful peripheral neuropathy	453
Intractable nausea/vomiting	312
HIV/AIDS	244
Epilepsy	201
Multiple sclerosis	197
Spinal cord damage w/intractable spasticity	135
Inflammatory autoimmune-mediated arthritis	134
Glaucoma	119
Severe anorexia/ cachexia	112
Crohn's disease	77
Hep C under treatment	46
Hospice care	16
ALS	7
Inclusion body myositis	1
Spasmodic torticollis (cervical dystonia)	3
TOTAL	9607

Cannabis pills



Smokable cannabis



Baked goods

Skin cream



Forms of Medicinal Cannabis

California Marijuana Laws

California marijuana laws changed drastically with the decriminalization of possession (under 28 grams) and legalization of medical marijuana under the Compassionate Use Act (Proposition 215).

But possession with intent to sell, possession or sale of more than 28 grams, and non-medical cultivation of marijuana are still serious crimes in California that often carry prison sentences upon conviction

– See more at: <http://statelaws.findlaw.com/california-law/california-marijuana-laws.html#sthash.4MG AeQWL.dpuf>

Colorado and Washington Blazed a Marijuana Legalization Trail:
Should Others Follow?





BREAKING: Live Video of Lawyers Discussing Obamacare Hearings | Watch News Conference on Mudslide

LEGAL POT

Money to Burn: Colorado Hauls in \$2M in One Month of Pot Taxes

Tax	January 2014 Actual
Retail 15% Excise Tax	\$ 195,318
Retail 10% Special Sales Tax	\$ 1,401,568
Medical 2.9% Sales Tax	\$ 913,519
Retail 2.9% Sales Tax	\$ 416,690
TOTAL TAX REVENUE	\$ 2,927,095
Retail Marijuana Fees	\$ 96,300
Medical Marijuana Fees	\$ 496,361
TOTAL FEE REVENUE	\$ 592,661
TOTAL REVENUE	\$ 3,519,756

Source: Colorado Department of Revenue

Recreational pot sales: Where the grass is much greener

By Michael Martinez, CNN

updated 5:53 AM EST, Sat January 4, 2014

CNN U.S.



Customers wait in a long line for their turn to buy recreational marijuana outside the LoDo Wellness Center on Wednesday, January 1, in Denver. Colorado is the first state in the nation to allow retail pot shops.

Stocks Surge Entering the Medical Marijuana Market: Next Gen Emerges as Venture Capitalist to [the Industry](#)

Tue, 25 Mar, 2014 9:40 AM EDT



Are you missing out on this historical time on Wall Street?

CBIS: from .0305 to .1195
291% GAIN!



MWIP: from .0024 to .1274
5208% GAIN!



GRNH: from .004 to .20
4900% GAIN!



PHOT: from .01 to .12
1100% GAIN!



MJNA: from .0246 to .50
1932% GAIN!



GRNH: from .01 to .15
1400% GAIN!



Medical Marijuana Stocks 2014

[Cannabis Science \(PINK: CBIS\) Medbox, Inc.](#)

[\(MDBX\)Medical Marijuana Marijuana, Inc.](#)

[\(PINK: MJNA\)](#)

[MediSwipe \(PINK: MWIP\)](#)

[Rapid Fire Marketing \(PINK:RFMK\)](#)



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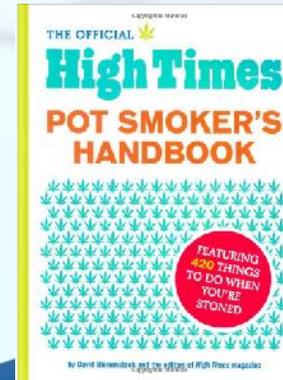
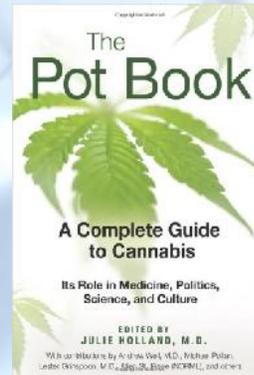
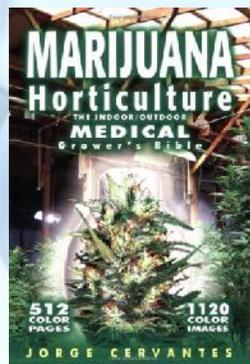
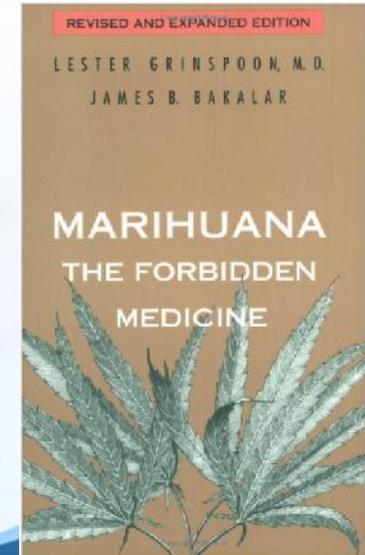
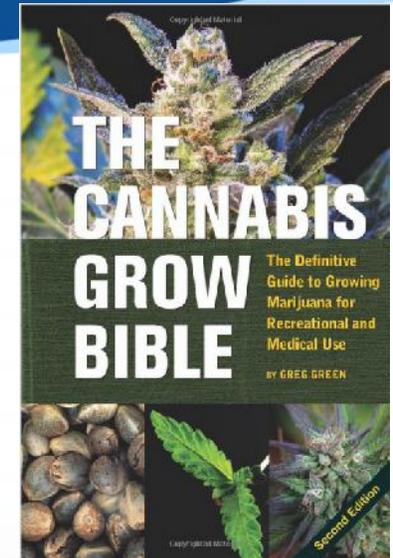
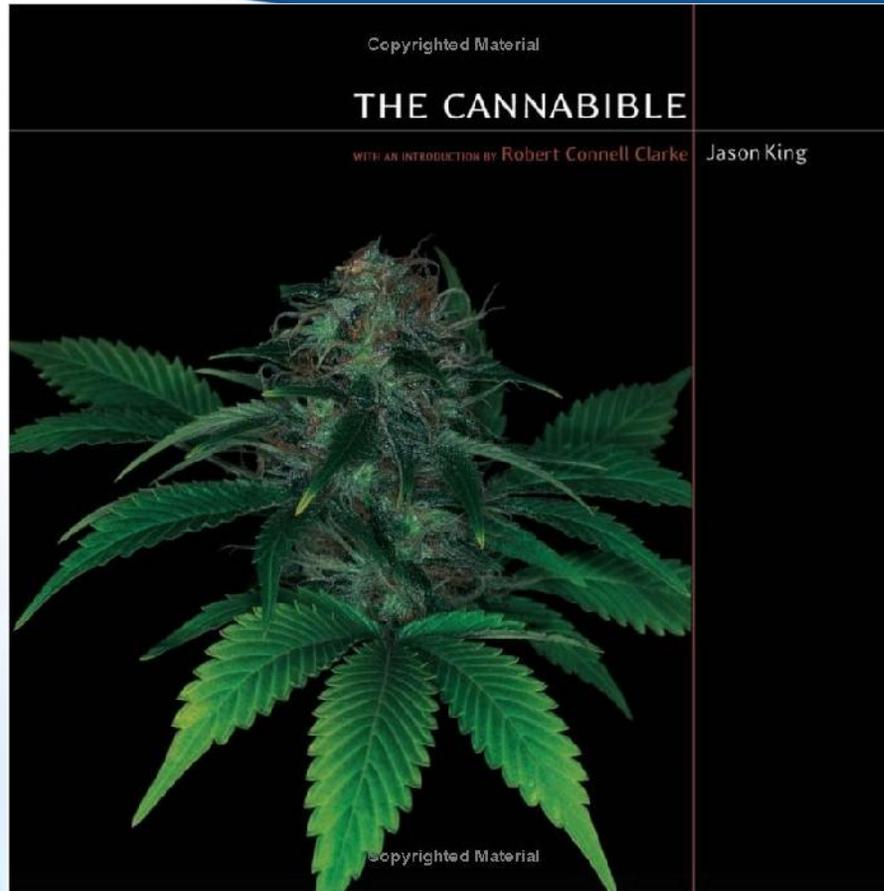
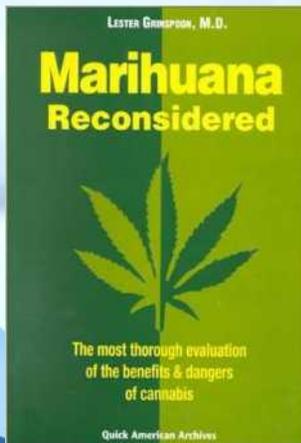
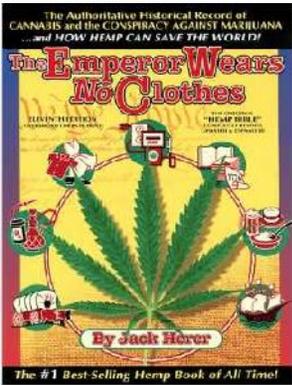
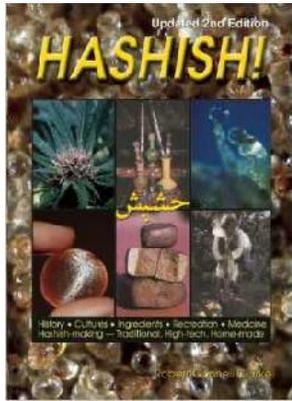
"The Harvard of Pot Schools," says Denver's WestWord!! Learn the Colorado Laws & To Grow Your Own Cannabis Under Any Conditions All-In-1-Day

"\$250.00 ALWAYS includes a Friend

Saturday All-In-1-Day Class:

April 5, May 3, June 7, July 12, Aug 2, Sept 6, Oct 4, Nov 8, Dec 6, 2014

CANNABIS UNIVERSITY™ Inc.



Summary

- Drug use trends continue to increase
- Legal Designer drugs are more prevalent
- The introduction of designer drugs will continue
- Marijuana use for both medical and recreational purpose continues to proliferate
- More research on marijuana may lead to new medicines.

THANK

YOU

