



Knowing now matters.™



# ABON™ K2 Synthetic Cannabinoids Drug Screen Test



# Agenda

**1** General information

**2** ABON™ K2 Synthetic Cannabinoids Drug Screen Test



# General information



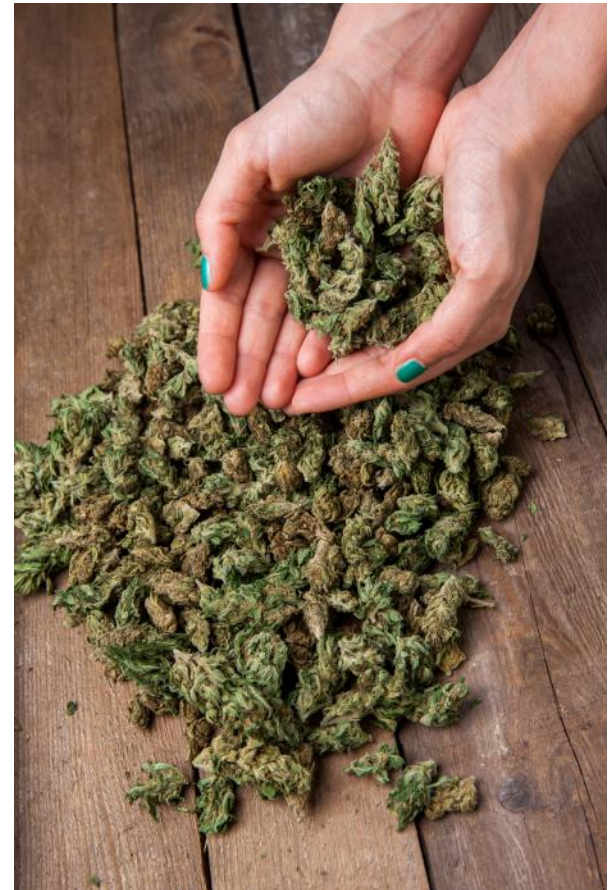
**Marijuana** has a long history of medicinal and recreational use, and is today the most widely produced and consumed illicit substance worldwide.

Data source from:

1. Seely K A, Lapoint J, Moran J H, et al. Spice drugs are more than harmless herbal blends: A review of the pharmacology and toxicology of synthetic cannabinoids[J]. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 2012, 39(2):234-243.

# Synthetic Cannabinoids

- **Synthetic cannabinoids** refer to a growing number of man-made mind-altering chemicals .
- These chemicals are called *cannabinoids* because they are related to chemicals found in the marijuana plant.
- Because of this similarity, synthetic cannabinoids are sometimes misleadingly called "synthetic marijuana" (or "fake weed"), and they are often marketed as "safe," legal alternatives to that drug.
- In fact, they may affect the brain much more powerfully than marijuana; their actual effects can be unpredictable and, in some cases, severe or even life-threatening.



Data sourced from:

2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>



# Synthetic Cannabinoids

## Why are they called Synthetic Cannabinoids?

- Synthetic cannabinoids act on the same brain cell receptors as delta-9-tetrahydrocannabinol (THC), the mind-altering ingredient in marijuana.
- These man-made mind-altering chemicals are nevertheless commonly absorbed by smoking and users often report effects similar to those of *Cannabis*:

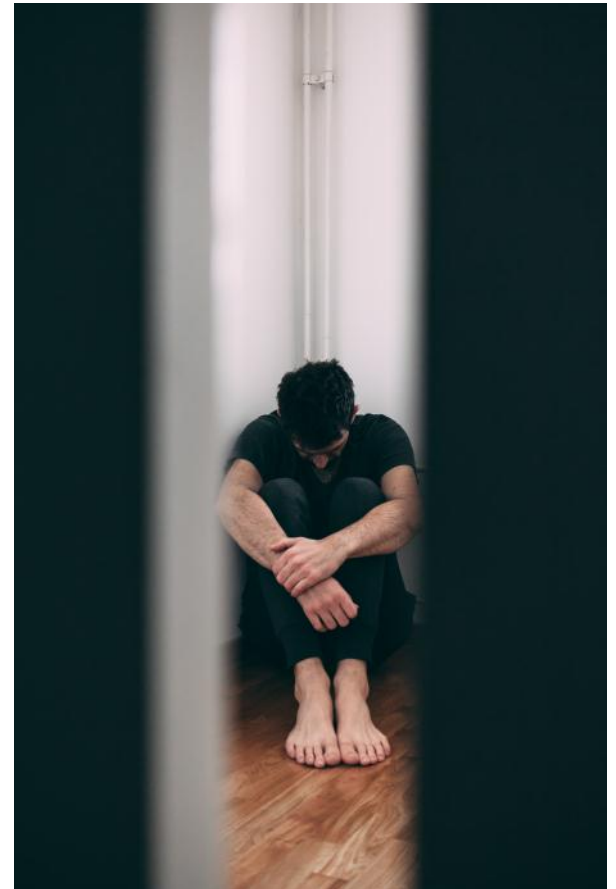
Reddened conjunctiva

Tachycardia

Dry mouth

Altered perceptions

Mood changes



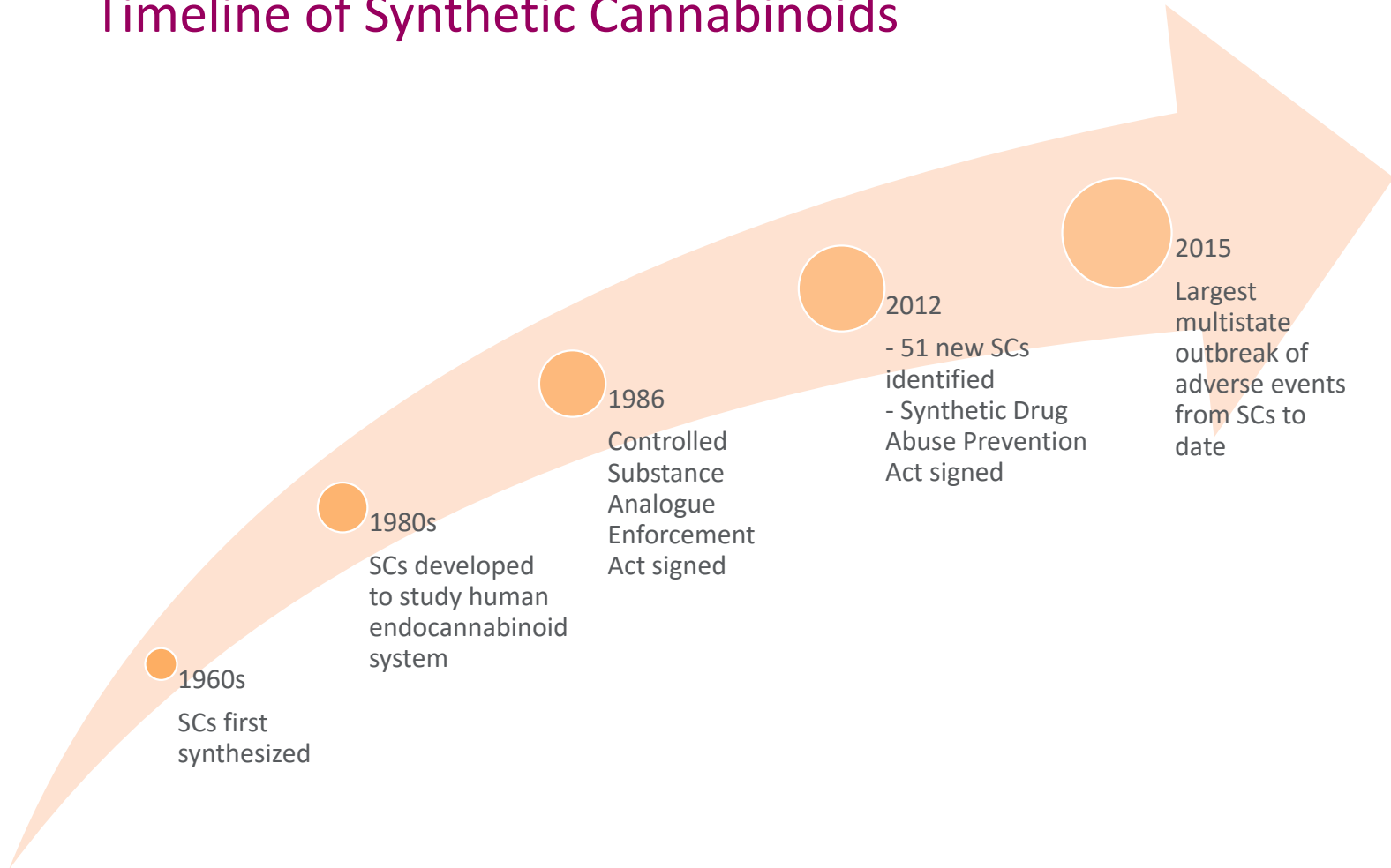
Data sourced from:

2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>
3. Moran C L, Le V H, Chimalakonda K C, et al. Quantitative Measurement of JWH-018 and JWH-073 Metabolites Excreted in Human Urine[J]. Analytical Chemistry, 2011, 83(11):4228-36.



# Synthetic Cannabinoids

## Timeline of Synthetic Cannabinoids



Data sourced from:

4. Synthetic Cannabinoids: Information and Guidance for Clinicians, Clinician Outreach and Communication Activity (COCA) Call March 31, 2016

# Synthetic Cannabinoids

- For several years, synthetic cannabinoid mixtures have been **easy to buy** in drug paraphernalia shops, novelty stores, gas stations, and through the Internet.
- Because the chemicals used in them have a **high potential for abuse and no medical benefit**, authorities have made it illegal to sell, buy, or possess some of these chemicals.
- However, manufacturers try to sidestep these laws by **changing the chemical formulas** in their mixtures.
- **Easy access** and the belief that synthetic cannabinoid products are "natural" and therefore harmless have likely contributed to their increase use among young people.
- Another reason for their use is that standard drug tests **cannot easily detect** many of the chemicals used in these products.



Data sourced from:

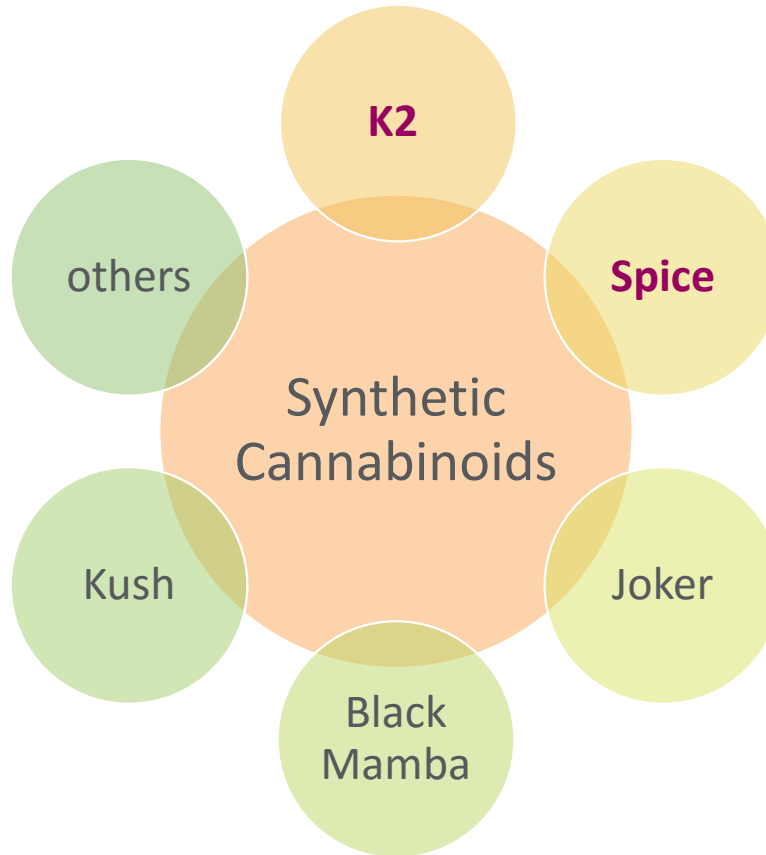
2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>





# Synthetic Cannabinoids

Manufacturers sell these herbal incense products in colorful foil packages and sell similar liquid incense products, like other e-cigarette fluids, in plastic bottles. They market these products under a wide variety of specific **brand names**:



Data sourced from:

2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>



# Synthetic Cannabinoids

Several Series and its origin(people or place)

JWH- XXX

• John William Huffman

AM-XXX

• Alexandros Makriyannis

HU-XXX

• Hebrew University

CP-XXX

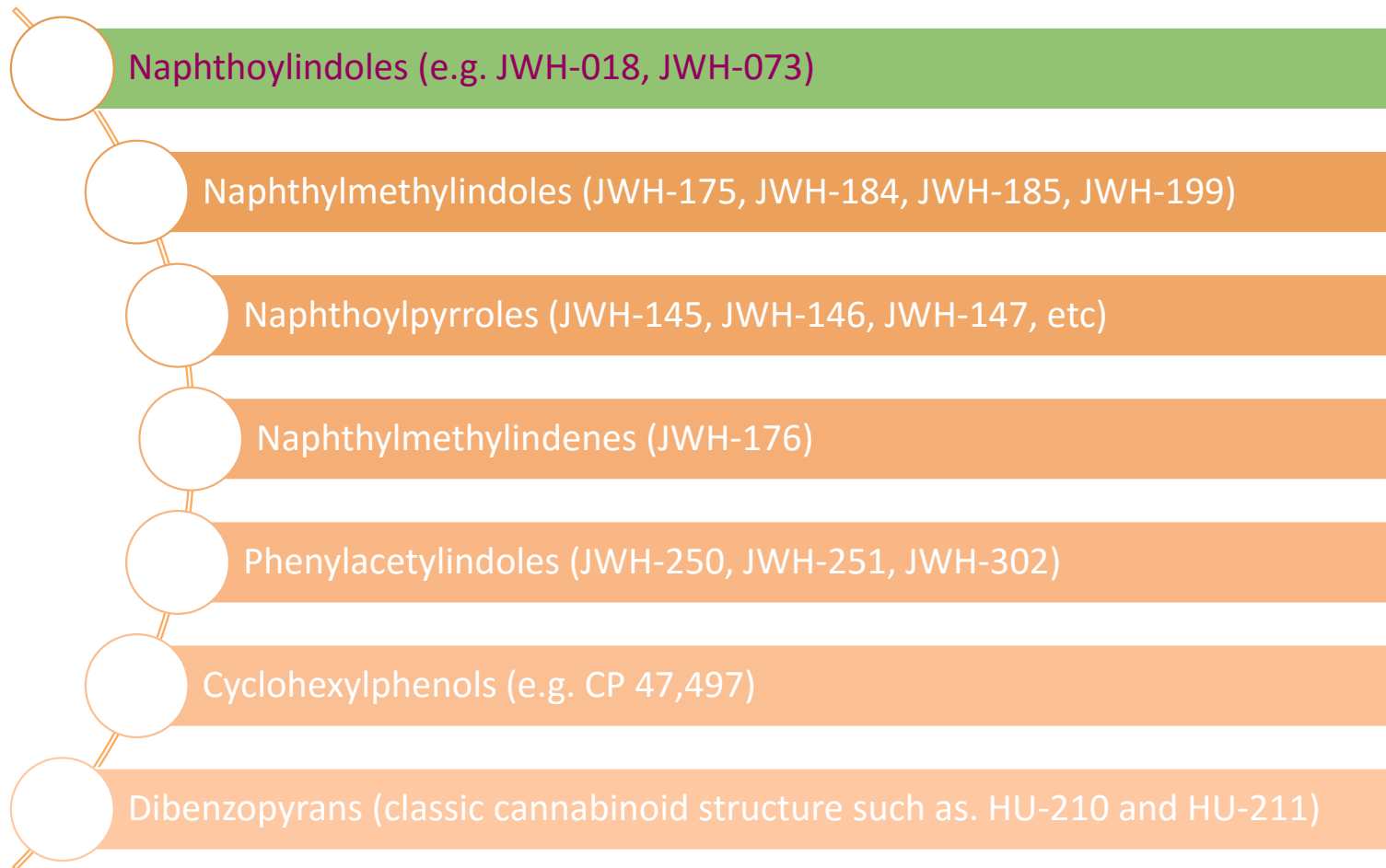
• Pfizer

Data sourced from:

4. Synthetic Cannabinoids: Information and Guidance for Clinicians, Clinician Outreach and Communication Activity (COCA) Call March 31, 2016

# Synthetic Cannabinoids

Synthetic cannabinoids fall into 7 major structural groups:



Data sourced from:

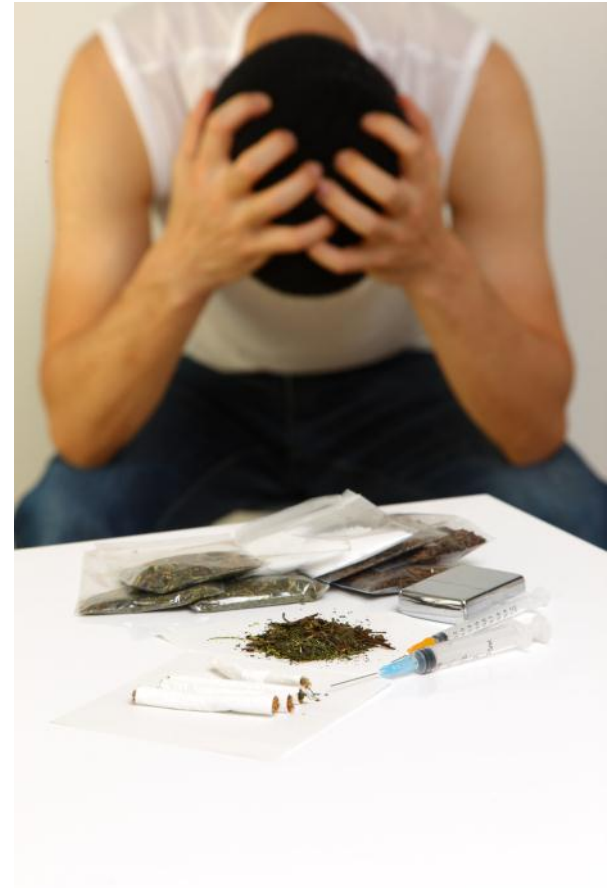
- Barnes A J, Young S, Spinelli E, et al. Evaluation of a homogenous enzyme immunoassay for the detection of synthetic cannabinoids in urine[J]. Forensic Science International, 2014, 241C(8):27-34.



# Synthetic Cannabinoids

How Synthetic Cannabinoids are used:

- Usually smoked.
- Can be vaped, ingested, insufflated(snorted)



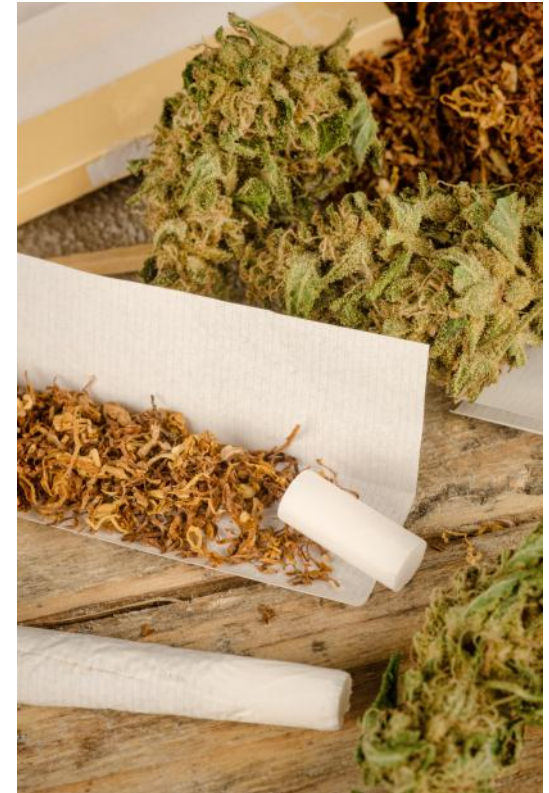
Data sourced from:

2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>

# Synthetic Cannabinoids

Synthetic cannabinoid users report some effects similar to those produced by marijuana:

- Elevated mood.
- Relaxation
- Altered *perception*-awareness of surrounding objects and condition
- Symptoms of *psychosis*
  - Extreme anxiety
  - Confusion
  - *paranoia*—extreme and unreasonable distrust of others
  - *hallucinations*—sensations and images that seem real though they are not



Data sourced from:

2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>

# Synthetic Cannabinoids

## Other effects caused by Synthetic Cannabinoids:

- Rapid heart rate
- Vomiting
- Violent behavior
- Suicidal thoughts

Synthetic cannabinoids can also raise blood pressure and cause reduced blood supply to the heart, as well as kidney damage and seizures. Use of these drugs is associated with a rising number of deaths.



Data sourced from:

2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>



# ABON™ K2 Synthetic Cannabinoids Drug Screen Test



# ABON™ K2 Drug Screen Test

Product Description	ABON™ K2 Synthetic Cannabinoids Drug Screen Test	
Intended Use	Lateral flow immunoassays for the specific, qualitative detection of synthetic cannabinoids(For JWH-018) in human urine	
Technology	Competitive, lateral –flow immunoassay with colloidal gold as the visual indicator	
Test Format	Single test device (102) and panel 1x4	
Specimen	Human Urine	
Time to Result	5 minutes	
Storage	2-30 °C	
Shelf Life	24 months	
Kit Size	Single test device (102)	Panel 1x4
	40 tests	25 tests
Catalog Number	DJW-102	DOA-124 to DOA-1104
<b>Cutoff Value</b>	<b>20 ng/mL</b>	





# ABON™ K2 Drug Screen Test

## Connection between K2 and JWH:

K2 is one of the most common brand name of synthetic cannabinoids. JWH is main component of K2.

## What is JWH?

Some of the first synthetic cannabinoids detected in Spice and K2 were synthesized and named after John W. Huffman, a medicinal chemist at Clemson University who was part of a NIDA funded research project to evaluate the therapeutic potential of many synthetic cannabinoids.



Data sourced from:

5. Seely K A, Lapoint J, Moran J H, et al. Spice drugs are more than harmless herbal blends: A review of the pharmacology and toxicology of synthetic cannabinoids[J]. Progress in Neuro-Psychopharmacology and Biological Psychiatry, 2012, 39(2):234-243.

FOR EXTERNAL USE. NOT FOR PRINT OR DISTRIBUTION. .



# ABON™ K2 Drug Screen Test

## Why test JWH?

- The “JWH” series of synthetic cannabinoids evolved from a computational melding of the chemical structural features of  $\Delta^9$ -THC with previously developed aminoalkylindoles.
- Today, the JWH series of cannabinoids are arguably the dominant cannabinoids detected in K2.
- JWH-018 (1-pentyl-3-(1-naphthoyl)indole) was one of the first compounds to be abused and probably selected because the compound is easily synthesized and has high pharmacological activity



Data sourced from:

5. Seely K A, Lapoint J, Moran J H, et al. Spice drugs are more than harmless herbal blends: A review of the pharmacology and toxicology of synthetic cannabinoids[J]. Progress in Neuro-Psychopharmacology and Biological Psychiatry, 2012, 39(2):234-243.

FOR EXTERNAL USE. NOT FOR PRINT OR DISTRIBUTION. .



# ABON™ K2 Drug Screen Test

- Format



Single device DJW-102

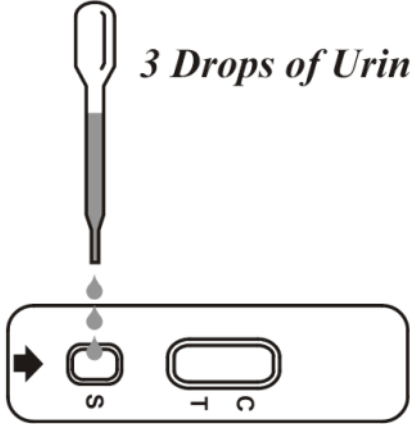





Panel 1x4



# Urine Tests – Single Strip & Device

## Test Procedure & Interpretation of results

Format	Test Procedure	Interpretation of Results		
		Positive	Negative	Invalid
Device Test				

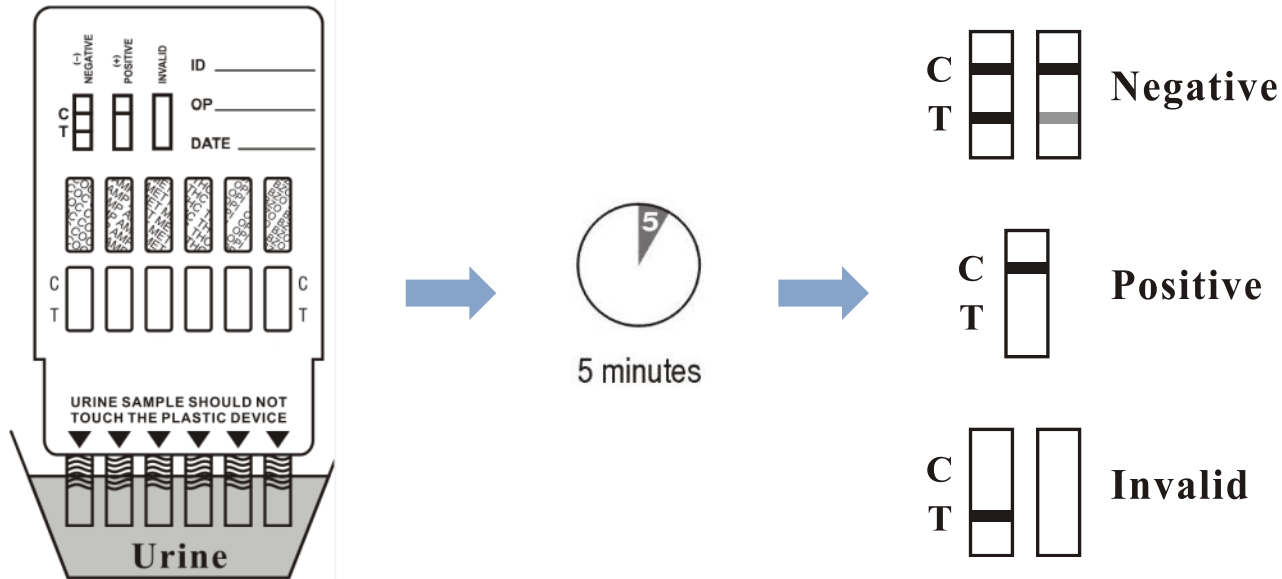
### Points to be noted

1. Avoid trapping air bubbles in the specimen well (S) of the device.
2. Read time is 5 minutes. The result should not be interpreted after 10 minutes.
3. Confirm that the control line has formed, then interpret the drug test lines.
4. The shade of color in the line region (T) may vary, but it should be considered negative whenever there is even a faint colored line.



# Urine Tests – Multi Drug Panel

## Test Procedure & Interpretation of results



## Points to be noted

1. Do not pass the arrows on the test panel when immersing the panel.
2. Read time is 5 minutes. The result should not be interpreted after 10 minutes.
3. Confirm the control line has formed on each strip, then interpret the drug test lines.
4. Any indication of a line regardless of color intensity is correctly interpreted as a negative test result.



# ABON Drug Test List

Test	Calibrator	Cut-off (ng/mL)
Amphetamine (AMP)	d-Amphetamine	1000/500/300
Barbiturates (BAR)	Secobarbital	300
Benzodiazepines (BZO)	Oxazepam	300/200
Buprenorphine (BUP)	Buprenorphine	10
Cocaine (COC)	Benzoyllecgonine	300/150
Cotinine (COT)	Cotinine	100
Fentanyl (FTY)	Norfentanyl	20
Heroin (HRN)	6-Monoacetylmorphine(6-MAM)	10
Ketamine (KET)	Ketamine	1000/100
Marijuana (THC)	11-nor- $\Delta^9$ -THC-9 COOH	50
Methadone (MTD)	Methadone	300
Methadone metabolite (EDDP 100)	2-Ethylidene-1,5-dimethyl-3,3-dipheylpyrrolidine (EDDP)	100
Methamphetamine (MET)	d-Methamphetamine	1000/500/300
Methylphenidate(MPH)	Ritalinic Acid	100
Methylenedioxymethamphetamine (MDMA)	d,l-Methylenedioxymethamphetamine	500
Morphine (MOP 300)	Morphine	300
Opiate (OPI 2000)	Morphine	2,000
Oxycodone (OXY)	Oxycodone	100
Phencyclidine (PCP)	Phencyclidine	25
Propoxyphene (PPX)	Propoxyphene	300
<b>K2 Synthetic Cannabinoids</b>	<b>JWH-018 5-Pentanoic acid metabolite</b>	<b>20</b>
Tramadol (TRA)	Tramadol	100
Tricyclic Antidepressants (TCA)	Nortriptyline	1,000



# Features & Benefits

Features	Benefits
Reliability	<ul style="list-style-type: none"><li>• Built-in QC verifies the test performed correctly</li><li>• High correlation with laboratory reference method</li></ul>
Fast Results	<ul style="list-style-type: none"><li>• 5-10 minutes Test Time</li></ul>
Shelf Life and Storage	<ul style="list-style-type: none"><li>• 24 months of shelf life from the date of manufacture</li><li>• Room temperature storage of entire kit</li></ul>
Convenience	<ul style="list-style-type: none"><li>• No additional equipment and operator training required</li><li>• Easy 1-step Procedure</li><li>• Convenient Visual Interpretation</li><li>• Wide choice of test combinations in multi drug formats</li></ul>



# Analytical Specificity

The following table lists the concentration of compounds (ng/mL) that are detected positive in urine by the One Step Drug Screen Test Device (Urine) at 5 minutes.

Item	Concentration	Item	Concentration
JWH-018 5-Pentanoic acid metabolite	20	MAM2201 N-pentanoic acid	50
AM2201 6-hydroxyindole metabolite	3125	JWH-018 5-hydroxypentyl	700
AM2201 N-(4-hydroxypentyl) metabolite	780	JWH-018 N-(4-hydroxypentyl)	600
Clonidine	6250	Ketoprofen	6250
Indomethacin	6250	Zomepirac	3125
JWH-018	3125	UR-144 N-pentanoic acid metabolite	25000
JWH-073 4-butanoic acid metabolite	20	XLR-11 4-Hydroxypentyl metabolite	40000
JWH-073 N-(3-hydroxybutyl)	500	JWH-122 4-hydroxypentyl	10000
JWH-073 4-hydroxybutyl	500	JWH-122 5-hydroxypentyl	5000





# Analytical Sensitivity

A drug-free urine pool was spiked with drugs to the concentrations at  $\pm$  50% cut-off and  $\pm$  25% cut-off. The results are summarized below.

Drug Conc. (Cut-off range)	K2			
	Device(DJW-102)		Panel(DOA-1*4)	
	-	+	-	+
0% Cut-off	90	0	90	0
-50% Cut-off	90	0	90	0
-25% Cut-off	72	18	65	25
Cut-off	37	53	22	68
+25% Cut-off	11	79	4	86
+50% Cut-off	0	90	0	90

ABON™ K2 Synthetic Cannabinoids Drug Screen Test has shown **High Sensitivity**



## Reference

1. Seely K A, Lapoint J, Moran J H, et al. Spice drugs are more than harmless herbal blends: A review of the pharmacology and toxicology of synthetic cannabinoids[J]. Progress in Neuro-Psychopharmacology and Biological Psychiatry, 2012, 39(2):234-243.
2. Drug Facts: Synthetic Cannabinoids, <https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids>
3. Moran C L, Le V H, Chimalakonda K C, et al. Quantitative Measurement of JWH-018 and JWH-073 Metabolites Excreted in Human Urine[J]. Analytical Chemistry, 2011, 83(11):4228-36
4. Synthetic Cannabinoids: Information and Guidance for Clinicians, Clinician Outreach and Communication Activity (COCA) Call March 31, 2016
5. Barnes A J, Young S, Spinelli E, et al. Evaluation of a homogenous enzyme immunoassay for the detection of synthetic cannabinoids in urine[J]. Forensic Science International, 2014, 241C(8):27-34.

