New Psychoactive Substances (NPS) trends 2016

'New psychoactive substances' (NPS) continue to be identified, and it appears that moves by the United Nations and by individual countries to control lists of named NPS may be encouraging the development of yet further variants to avoid these controls. Strategies used to develop new materials include creating modified versions of pharmaceuticals, 'reviving' forgotten pharmaceuticals from old research literature and making 'bioisosteres' of controlled materials, where sub-units within a controlled molecule are replaced by other units with similar chemical, spatial and electrical characteristics.

Stimulants

Several long-known stimulant NPS continue to be regularly encountered, including methiopropamine (MPA) the thiophene bioisostere of methamphetamine and ethylphenidate, the ethyl homologue of methyl phenidate. As these materials become widely controlled, others are appearing as replacements, including 3-fluorophenmetrazine and 4-fluoromethylphenidate, both modified versions of stimulant pharmaceuticals.

NPS	Reference standard
Methiopropamine	LGCFOR/AMP1275.59
Ethylphenidate	LGCFOR1031.09
3-Fluorophenmetrazine	LGCFOR1692.02
4-Fluoromethylphenidate	CHI-11343.14

Phenethylamines

1) Amphetamines

4-Fluoroamphetamine and 4-methylamphetamine continue to be seen in amphetamine seizures. The para-methoxy forms of amphetamine and methamphetamine (PMA and PMMA) also continue to appear in supposed amphetamine or Ecstacy products and are cause for particular concern due to their toxicity.

NPS	Reference standard
4-Fluoroamphetamine	LGCFOR/AMP0741.02
4-Methylamphetamine	NMIAD895
PMA	LGCFOR/AMP0447.07
PMMA	LGCFOR/AMP1360.01

2) 'Benzofuries'

The APB 'benzofury' compounds have been widely marketed as legal replacements for Ecstacy.

Synthetic cannabinoids

Synthetic cannabinoids continue to appear and the trend appears to be towards ever more potent substances. MDMB-CHMICA in particular has been associated with serious adverse events, including deaths.

Following widespread legislation intended to control '2nd generation' cannabinoids, such as AM 2201 and UR-144, a '3rd generation' of materials now dominate the market. A number of modifications from previous chemistry have been made, including changing from indole to indazole cores, using carboxamide or carboxylate links and employing quinolinyl rings. It is also increasingly common for branded herbal smoking materials to contain two or more different cannabinoids. Some potent and volatile materials are being formulated into solutions ('C-liquids') suitable for use by vapourisation in 'e-cigarettes'.

The '3rd generation materials' most frequently being encountered are:

NPS	Reference standard
5F AKB48	LGCFOR/AMP1396.13
5F PB-22	CAY-14095
MDMB-CHMICA*	CAY-16965

Other '3rd generation materials' being offered for sale include:

NPS	Reference standard
AKB-48 (APINACA)	LGCFOR/AMP1396.12
AB-FUBINACA	CAY-14039
BB-22 (QUCHIC)	CAY-14099
PB-22 (QUPIC)	CAY-ISO 00122
APICA (2NE1)	CAY-9001193
5 FI APICA (STS135, 2NE2)	CAY-11564
THJ-018	LGCFOR/AMP1396.16
THJ-2201	CAY-14789
AB-PINACA	CAY-14038
ADB-PINACA	CAY-ISO 00150
AB-CHMINACA	CAY-15434
MDMB-CHMINACA	CAY-16200
5F-CUMYL-PINACA	CAY-17726

'2nd generation' materials are still occasionally being seen, including:

NPS	Reference standard
AM 2201	LGCFOR1396.02
MAM 2201	CAY-9001219
UR-144	LGCFOR/AMP1396.10
UR-144F	NMIA D1000

Note: There has been confusion on websites selling NPS between MDMB-CHMICA (indole core) and MMB- or MDMB-CHMINACA (indazole core). The material which has most frequently been identified through analysis is MDMB-CHMICA.

NPS	Reference standard
5-APB	LGCFOR/AMP1275.24
6-APB	LGCFOR/AMP1275.23
N-Methyl 5-APB	LGCFOR1389.05
N-Ethyl 5-APB	CAY-15282

3) 'NBombs'

NBOMe variants of phenethylamines ('NBomb' compounds) are extremely potent hallucinogens, with doses in the sub-milligram range, so they can be sold as paper doses (similar to LSD 'tabs'). Many such materials are possible, and many standards have been made available from several suppliers, but the most commonly encountered materials are:

NPS	Reference standard
25I-NBOMe	LGCFOR1397.01
25B-NBOMe	NMIA D995
25C-NBOMe	LGCFOR1397.06

4) '2C-X' compounds

The '2C-X' compounds (2,5-dimethoxyphene-thylamines) originally described by Shulgin have reappeared, particularly 2C-B and 2C-I. The related DOB has also been encountered.

NPS	Reference standard
2C-B	NMIAD758
2C-I	NMIAD922
DOB	NMIAD396

These materials are controlled in most jurisdictions, but a closely-related and uncontrolled material, bk-2C-B, is widely on sale.

NPS	Reference standard
Bk-2C-B	LGCFOR1387.15

Cathinones

The range of cathinone stimulants seen has stabilised, with mephedrone established as a mainstream drug of abuse.

NPS	Reference standard
Mephedrone	LGCFOR/AMP1387.01

Many other cathinones are seen, amongst which the most common have been:-

NPS	Reference standard
4-Methylethcathinone(4-MEC)	LGCFOR/AMP1275.02
4-Chloromethcathinone	CAY-16436
Methylone	LGCFOR/AMP1275.01
α-PVP	CAY-9001083
Ethylone	LGCFOR/AMP1275.02

Other prominent cathinones are:

NPS	Reference standard
Pentedrone	LGCFOR/AMP1275.63
Flephedrone	LGCFOR/AMP1275.33
MDPV	LGCFOR 1275.34
Methedrone	LGCFOR/AMP1275.04
Butylone	LGCFOR/AMP1275.03

Benzodiazepines (BZDs)

Two types of BZDs are being sold as NPS – pharmaceuticals imported from other parts of the world, such as phenazepam and etizolam, and 'designer' BZDs which are not in any pharmacopoeias. Commonly seen are:

NPS	Reference standard
Etizolam	LGCFOR1386.00
Phenazepam	LGCFOR/AMP0828.00
Flubromazepam	LGCFOR/AMP1442.00
Pyrazolam	LGCFOR/AMP1441.00
Clonazolam	CAY-18173
Diclazepam	LGCFOR/AMP1850.01
Deschloroetizolam	LGCFOR/AMP1386.01

Piperazines

Although now widely controlled, piperazines are still encountered, particularly benzylpiperazine and trifluoromethyl phenylpiperazine.

NPS	Reference standard
Benzylpiperazine	CAY-11202
Trifluoromethyl phenylpiperazine	LGCFOR/AMP1280.03

Indanes

Indane-based NPS are primarily serotonin-releasing agents and are usually found mixed with NPS stimulants such as MPA or ethylphenidate, presumably combined in an attempt to simulate the effects of MDMA.

NPS	Reference standard
2-Aminoindane	LGCFOR/AMP1275.50
N-Methyl 2-aminoindane	LGCFOR1389.09
MDAI	LGCFOR1275.05

Ketamine-type materials

Ketamine and methoxetamine continue to be seen, but a group of materials claimed to have similar dissociative effects, but structurally related to lefetamine, are being advertised, including diphenidine, methoxphenidine and MT-45.

NPS	Reference standard
Ketamine	LGCFOR/AMP0144.00
Methoxetamine	LGCFOR/AMP1275.65
Diphenidine	LGCFOR/AMP1366.15
Methoxphenidine	LGCFOR/AMP1366.16
MT-45	CAY-14052

Opioids

Several opioid NPS have been observed on sale on specialist websites. However, only one (AH-7921) appears to have become widely available. A recent EMCDDA-Europol report on this material included a list of associated deaths and it is now widely controlled.

NPS	Reference standard
AH-7921	CAY-12036 CERA-113

There are increasing reports of fentanyl abuse amongst opiate users. It is believed that the fentanyl is probably being obtained by extraction from pain-relief fentanyl patches (both used and unused). In addition, some ‘designer’ fentanyls have been encountered, particularly acetyl fentanyl and ocfentanil, usually in materials being passed off as heroin.

NPS	Reference standard
Fentanyl	LGCFOR/AMP0528.00
Acetyl fentanyl	CAY-14641
Ocfentanil	CAY-18583

Pharmaceuticals

A number of pharmaceuticals have begun to appear alongside NPS, including gabapentin and pregabablin which have become popular with opiate users and prisoners.

NPS	Reference standard
Gabapentin	LGCFOR0684.00
Pregabalin	LGCFOR/AMP1376.00
Quetiapine	LGCFOR/AMP1130.00
Zopiclone	LGCFOR/AMP0149.00
Tramadol	LGCFOR/AMP0007.00

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