SYNTHETIC CANNABINOID NAMING GUIDE

Synthetic cannabinoid naming is the most structured under the NPS umbrella, using a legacy **semi-systematic alpha-numeric scheme** that correlates back to structural moieties and formal chemical nomenclature. Synthetic cannabinoid naming stems from four structural subcomponents commonly referred to as the head moiety (or linked group), the core moiety, the tail moiety, and the linker moiety (see **Figure 1**). Constant emergence of new synthetic cannabinoids requires this process to be documented yet flexible to include evolving chemistries. Recent novel synthetic cannabinoids without systematic names have illustrated the need for development and implementation of a formal naming guide and process (e.g., BZO-HEXOXIZID formerly MDA-19, CHO-4'Me-5'Br-FUBOXPYRA formerly CH-FUBBMPDORA).

SEMI-SYSTEMATIC ALPHA-NUMERIC SCHEME

SIMPLE NAMING SCHEME

Head – Tail.Core.Linker

Examples: *ADB-BUTINACA, MDMB-PICA, CH-PIATA*

COMPLEX NAMING SCHEMES

WITH MODIFICATIONS AND/OR SUBSTITUTATIONS

Tail Substitution:

Tail.Sub – Head – Tail.Core.Linker

Examples: *5F-MDMB-PICA, 4CN-CUMYL-BUTINACA*

Tail Modification:

Head – Tail.Mod – Tail.Core.Linker

Examples: *ADB-4en-PINACA, MDMB-3en-BUTICA*

Core Substitution:

Head – Core.Sub' – Tail.Core.Linker

Examples: *ADB-5'Br-PINACA, CHO-4'Me-5'Br-FUBOXPYRA*

Complex Combinations:

Tail.Sub – Head – Core.Sub' – Tail.Core.Linker
Head – Core.Sub' – Tail.Mod – Tail.Core.Linker
Tail.Sub – Head – Core.Sub' – Tail.Mod – Tail.Core.Linker
Head – Core.Sub – Core.Linker

Examples: *ADB-5'Br-4en-PINACA, 5F-MDMB-5'F-PINACA*

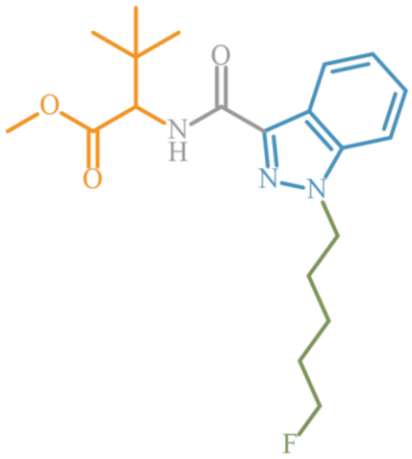
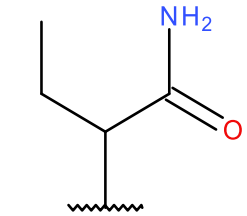
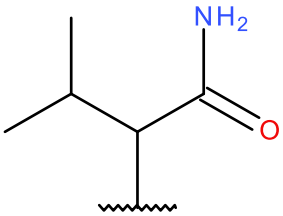
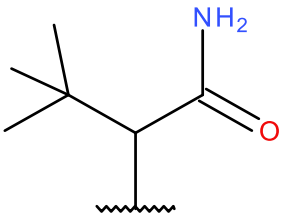
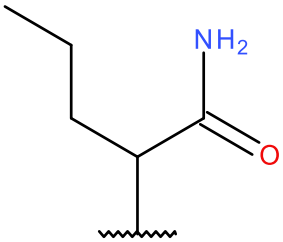
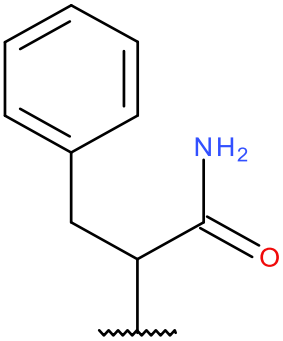


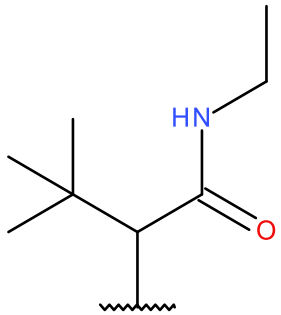
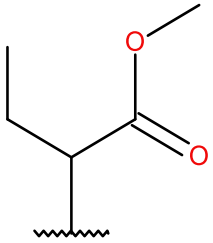
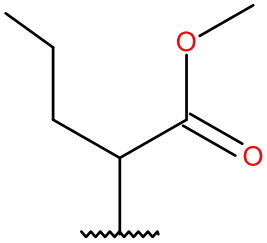
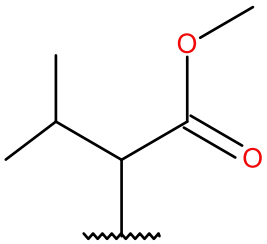
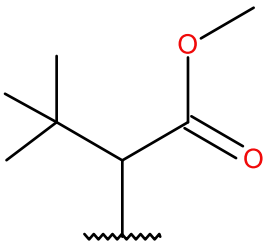
Figure 1: Synthetic cannabinoid *5F-MDMB-PINACA* showing the four structural subcomponents.

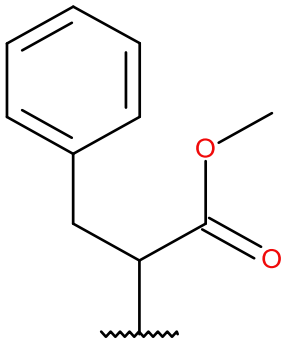
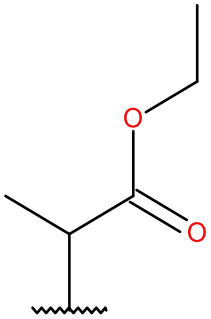
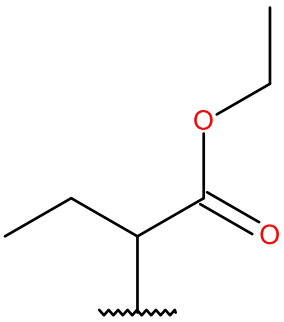
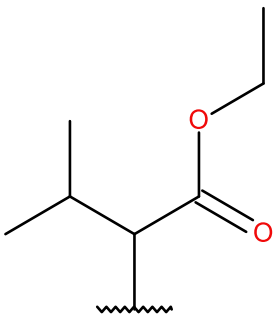
Note: *All components of the scheme will not be present within every molecule so the appropriate scheme should be selected for naming.*

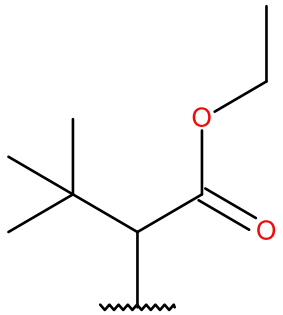
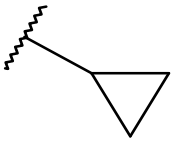
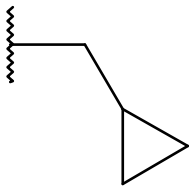
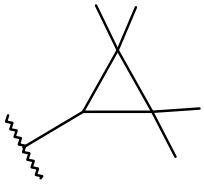
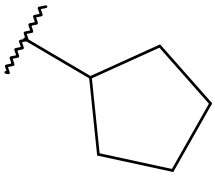
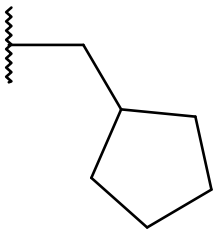
Definitions: Substitution = Replacing one atom (e.g., hydrogen) with another atom (e.g., fluorine, chlorine) [pentyl to 5F-pentyl].
Modification = Exchanging one group with another group (e.g., alkane to alkene chain) [pentyl to 4en-pentyl].

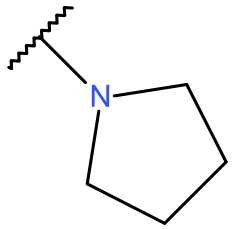
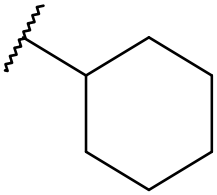
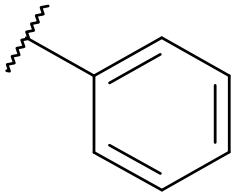
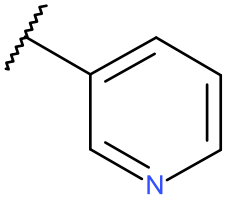
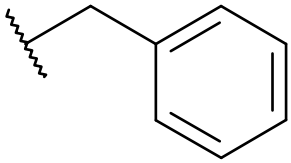
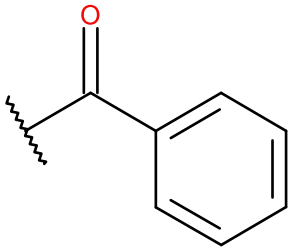
Table 1: Head Groups for Synthetic Cannabinoids

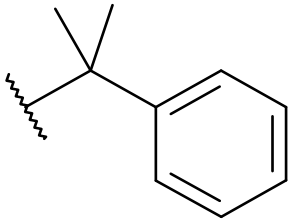
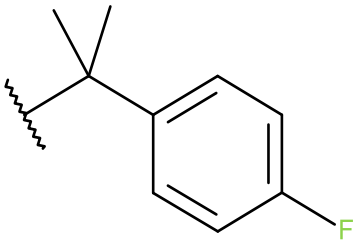
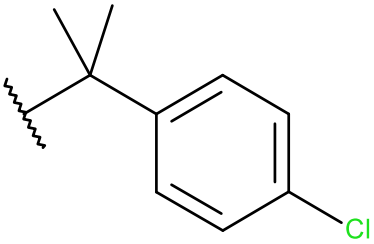
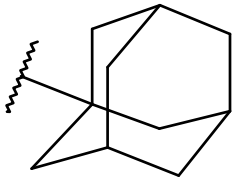
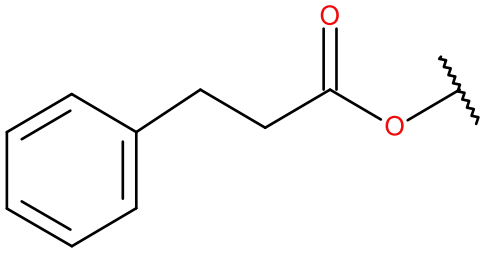
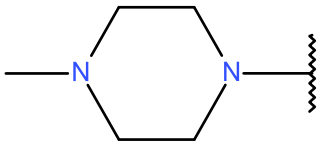
Head Structure	Abbreviation	Formal Name
	AMP	1-amino-1-oxobutyl (**a**mino-**m**ethyl-**p**ropyl)
	AMB (or AB)	1-**a**mino-3-**m**ethyl-1-oxo**b**utyl
	ADB (or ADMB)	1-**a**mino-3,3-**d**i**m**ethyl-1-oxo**b**utyl
	AEP	1-amino-1-oxopentyl (**a**mino-**e**thyl-**p**ropyl)
	APP	1-**a**mino-1-oxo-3-**p**henyl**p**ropyl

	EADB (or EADMB)	**e**thyl 1-**a**mino-3,3-**dim**ethyl**b**utanamine
	MB	**m**ethyl **b**utanoate
	MP	**m**ethyl **p**entanoate
	MMB	**m**ethyl 3-**m**ethyl **b**utanoate
	MDMB	**m**ethyl 3,3-**dim**ethyl**b**utanoate

	MPP (or MPhP)	**m**ethyl-3-**p**henyl **p**ropanoate
	EP	**e**thyl **p**ropanoate
	EB	**e**thyl **b**utanoate
	EMB	**e**thyl 3-**m**ethyl-**b**utanoate

	EDMB	**e**thyl 3,3-**di****m**ethyl-**b**utanoate
	M	**m**ethyl
	CPr	**c**yclo**pr**opyl
	CPrM (or CYP)	**c**yclo**pr**opyl**m**ethyl
	TMCP	**t**etra**m**ethyl-**c**yclo**p**ropane
	CP	**c**yclo**p**entyl
	CPM	**c**yclo**p**entyl**m**ethyl

	PY	1-**py**rrolidinyl
	CH	**c**yclo**h**exyl
	PH	**ph**enyl
	PD	**p**yri**d**in-3-yl
	BZ	**b**en**z**yl
	BZO	**b**en**zo**yl

	CUMYL	**cumyl**
	4F-CUMYL	**4**-**f**luoro-**cumyl**
	4Cl-CUMYL	**4**-**c**h**l**oro-**cumyl**
	A (or ADAMANTYL)	**a**damantyl
	MPHP	**m**ethyl 3-**ph**enyl- **p**ropanoate
	MEPIRA	4-**me**thyl-**pi**pe**ra**zin-1-yl

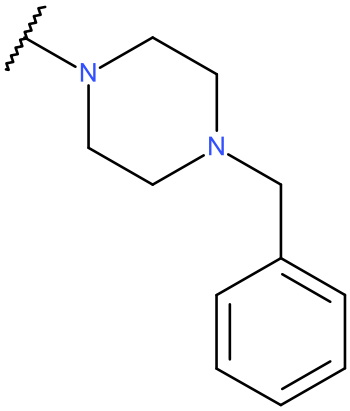
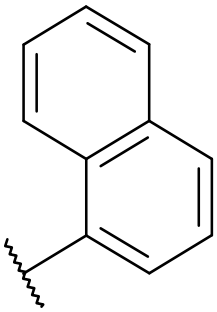
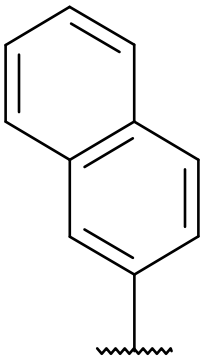
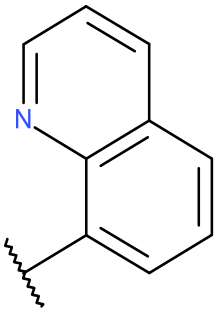
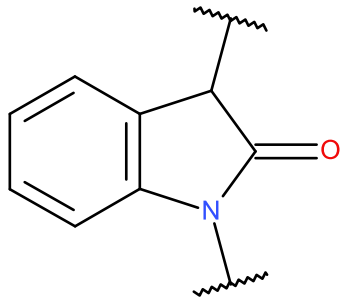
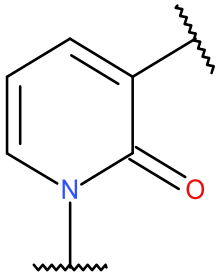
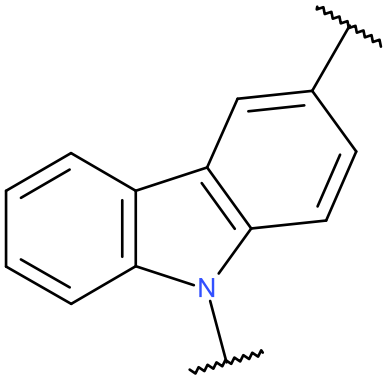
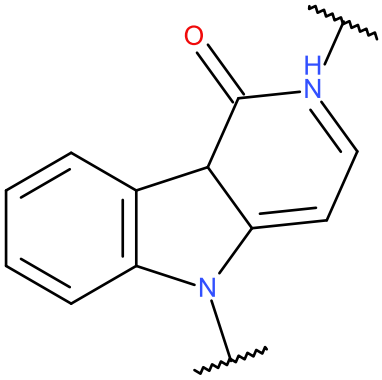
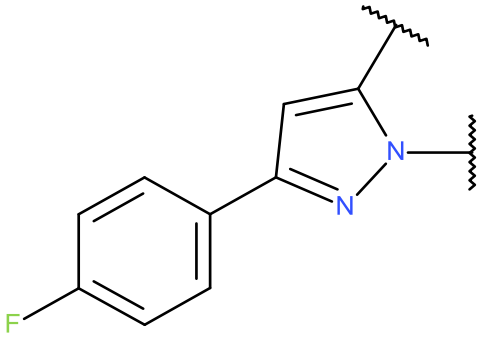
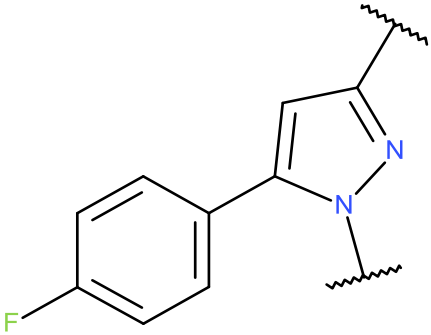
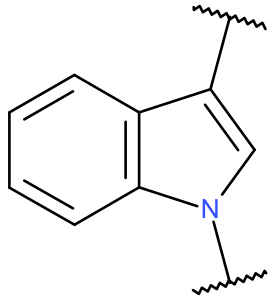
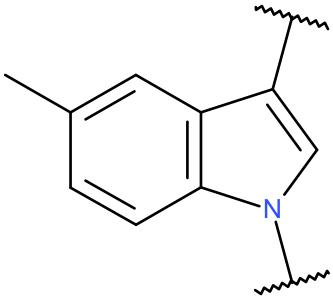
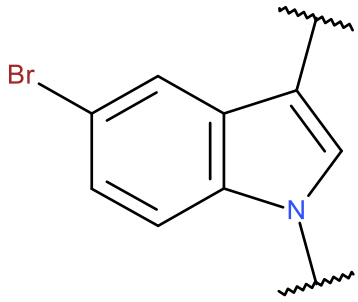
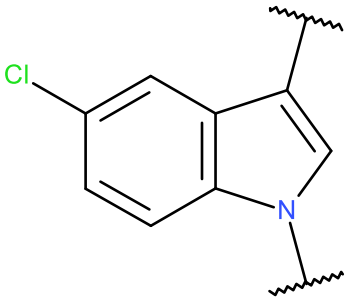
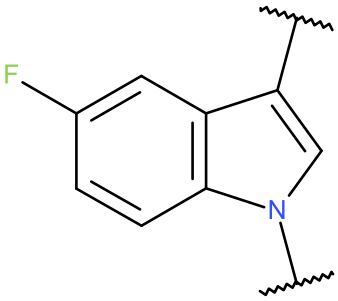
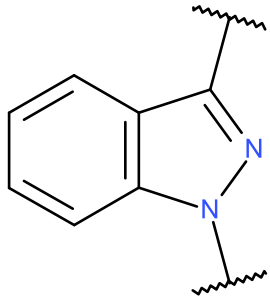
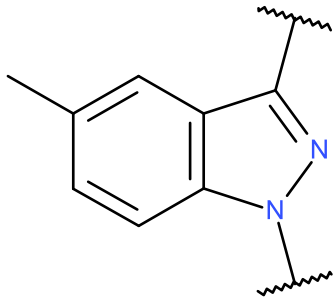
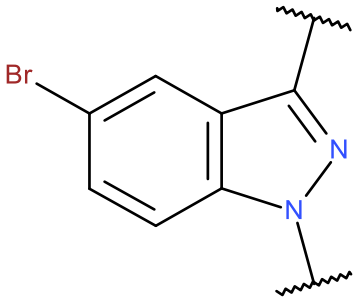
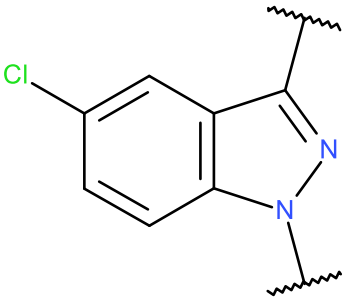
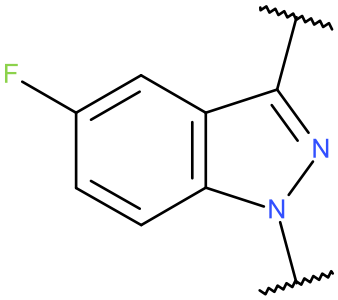
	BEPIRA	1-**be**nzyl-**pi**pe**ra**zine
	NA	1-**na**phtyl
	2NA	**2**-**na**pthyl
	QU	8-**qu**inolinyl

Table 2: Core Groups for Synthetic Cannabinoids

Core Structure	Abbreviation	Formal Name
	OXI	1,3-dihydro-2H-indole-2-one (2-**oxi**ndole)
	OXPYR	2-**ox**o-1,3-dihydro**pyr**idine-3-yl
	CZ	9H-**c**arba**z**ole
	GACLONE	5,9b-dihydro-1H-pyrido[4,3-b]indol-1-one (**ga**mma-**c**arbo**l**in-1-**one**)

	3,5__FUPPY	**3**-(4-**flu**oro**p**henyl)-1H-**py**razole-**5**-
	5,3__FUPPY	**5**-(4-**flu**oro**p**henyl)-1H-**py**razole-**3**-
	I	1H-**i**ndole
	5'Me__I (or 5Me__I with no tail)	**5**-**me**thly-1H-**i**ndole

	5'Br__I (or 5Br__I with no tail)	**5**-**br**omo-1H-**i**ndole
	5'Cl__I (or 5Cl__I with no tail)	**5**-**c**h**l**oro-1H-**i**ndole
	5'F__I (or 5F__I with no tail)	**5**-**f**luoro-1H-**i**ndole
	INA	1H-**in**d**a**zole

	5'Me__INA (or 5Me__INA with no tail)	**5**-**me**thyl-1H-**in**d**a**zole
	5'Br__INA (or 5Br__INA with no tail)	**5**-**br**omo-1H-**in**d**a**zole
	5'Cl__INA (or 5Cl__INA with no tail)	**5**-**ch**loro-1H-**in**d**a**zole
	5'F__INA (or 5F__INA with no tail)	**5**-**fl**uoro-1H-**in**d**a**zole

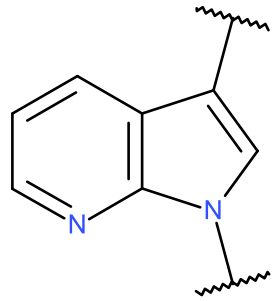
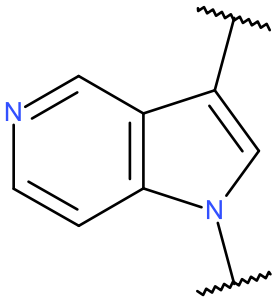
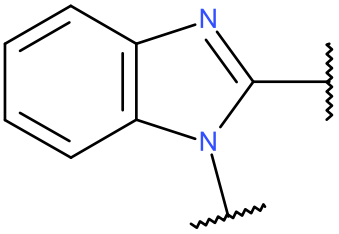
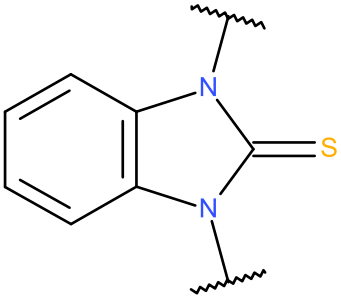
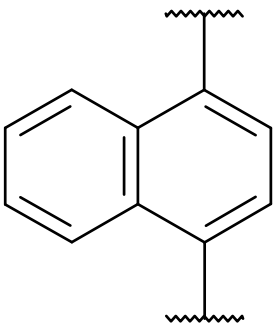
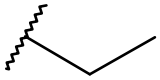
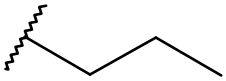
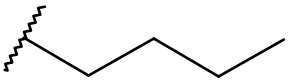
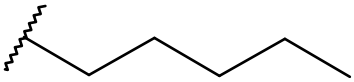
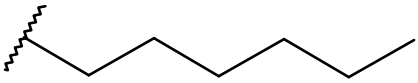
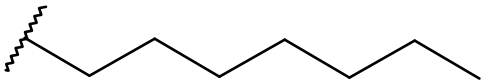
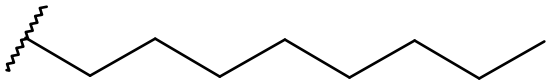
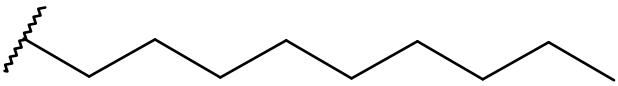
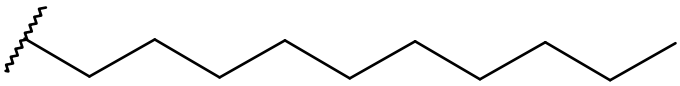
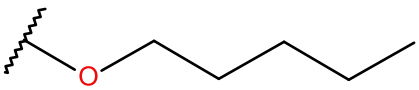
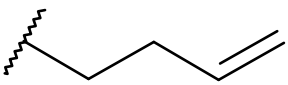
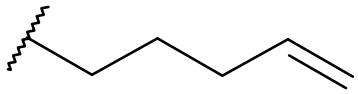
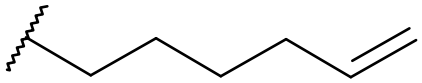
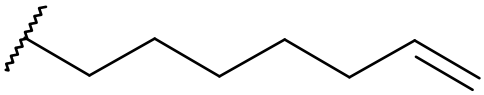
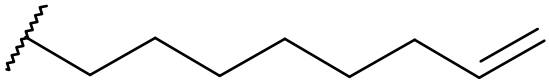
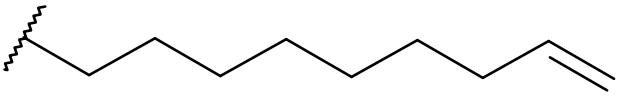
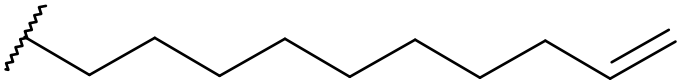
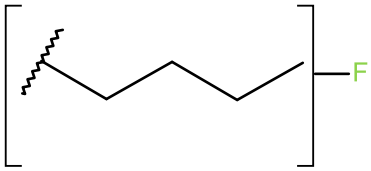
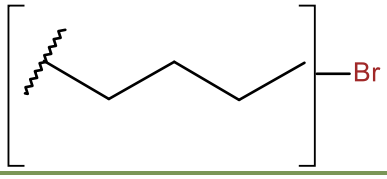
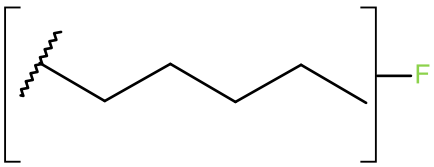
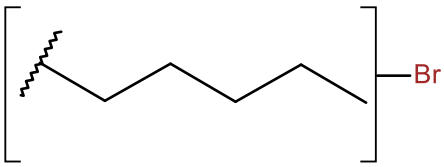
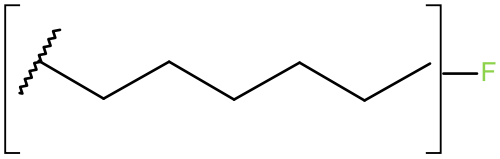
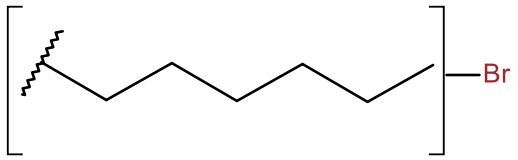
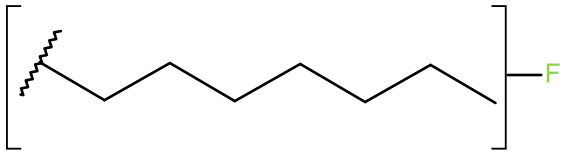
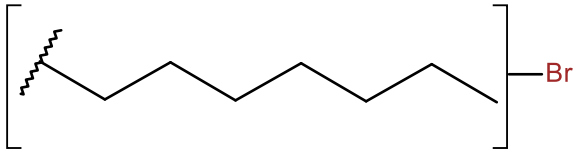
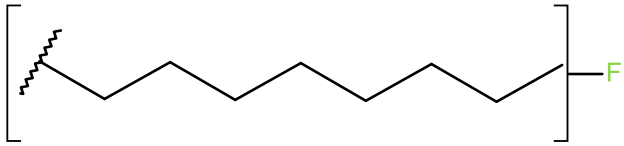
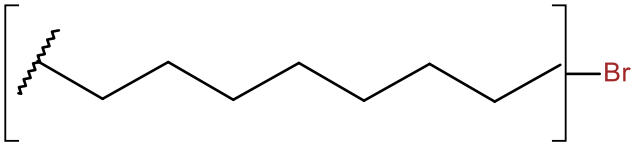
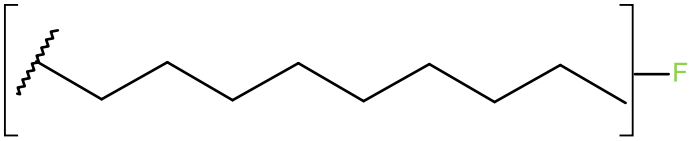
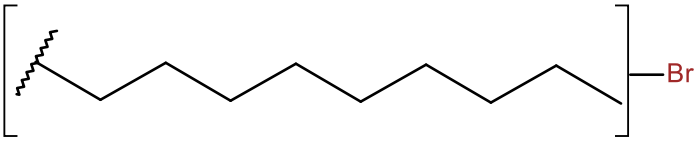
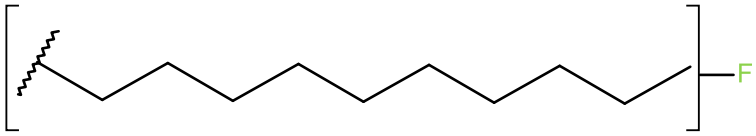
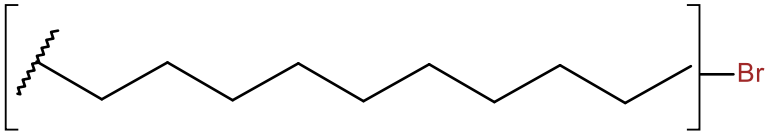
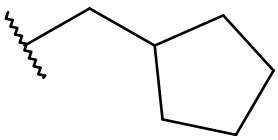
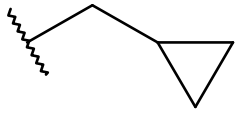
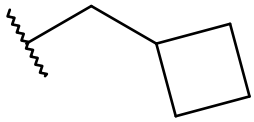
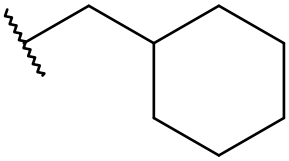
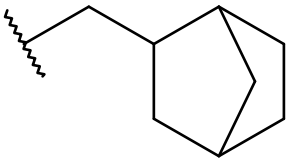
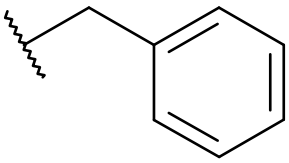
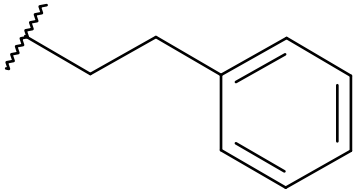
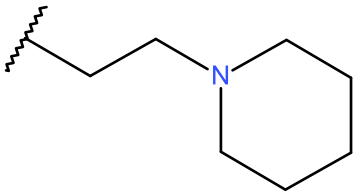
	7AI	1H-pyrrolo[2,3-b]pyridine (1H-**7**-**a**za**i**ndole)
	5AI	1H-pyrrolo[3,2-c]pyridine (1H-**5**-**a**za**i**ndole)
	BIM	**b**enzo[d]**im**idazole
	BIT	1,3-dihydro-2H-**b**enzo[d]**i**midazole-2-**t**hione
	NA	**na**phthalene

Table 3: Tail Groups for Synthetic Cannabinoids

Tail Structure	Abbreviation	Formal Name
	M	**m**ethyl
	E	**e**thyl
	Pr	**pr**opyl
	BUT (or B)	**but**yl
	P	**p**entyl
	HEX	**hex**yl
	HEPT	**hept**yl
	OCT	**oct**yl
	NON	**non**yl
	DEC	**dec**yl
	PO	**p**entyl**o**xy
	3en-BUT (or 3en-B)	1-(**but**-**3**-**en**-1-yl)

	4en-P	1-(**pent**-**4**-**en**-1-yl)
	5en-HEX	1-(**hex**-**5**-**en**-1-yl)
	6en-HEPT	1-(**hept**-**6**-**en**-1-yl)
	7en-OCT	1-(**oct**-**7**-**en**-1-yl)
	8en-NON	1-(**non**-**8**-**en**-1-yl)
	9en-DEC	1-(**dec**-**9**-**en**-1-yl)
	#F__BUT (or #F__B)	**#**-**f**luoro**but**yl
	#Br__BUT (or #Br__B)	**#**-**br**omo**but**yl
	#F__P	**#**-**f**luoro**p**entyl
	#Br__P	**#**-**br**omo**p**entyl
	#F__HEX	**#**-**f**luoro**hex**yl

	#Br__HEX	**#-br**omo**hex**yl
	#F__HEPT	**#-f**luoro**hept**yl
	#Br__HEPT	**#-br**omo**hept**yl
	#F__OCT	**#-f**luoro**oct**yl
	#Br__OCT	**#-br**omo**oct**yl
	#F__NON	**#-f**luoro**non**yl
	#Br__NON	**#-br**omo**non**yl
	#F__DEC	**#-f**luoro**dec**yl
	#Br__DEC	**#-br**omo**dec**yl
	CPM	**c**yclo**p**enyl**m**ethyl

	CPrM	**c**yclo**pr**opyl**m**ethyl
	CBM	**c**yclo**b**utyl**m**ethyl
	CHM	**c**yclo**h**exyl**m**ethyl
	NBM (or NB-Me)	**n**or**b**ornyl**m**ethyl
	BENZ	1-**benz**yl
	PHET	2-**ph**en**et**hyl
	PIPET	2-(**pip**eridin-1-yl)**et**hyl

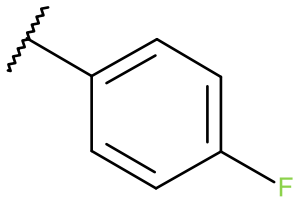
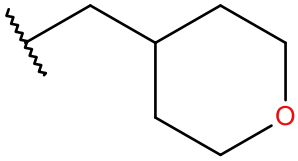
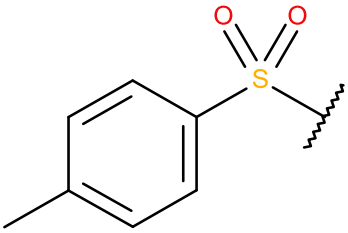
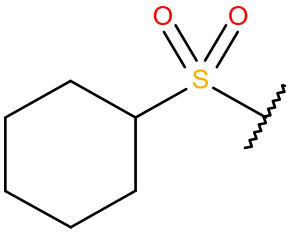
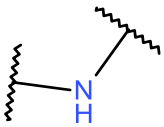
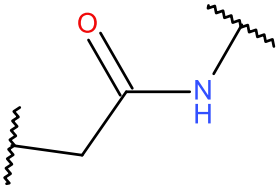
	FUB	4-fluorophenyl (4-**flu**oro**b**enzyl)
	THP	**t**etra**h**ydro**p**yran-4-ylmethyl
	TS	**t**o**s**yl
	CHS	**c**yclo**h**exyl**s**ulfonyl

Table 4: Linker Groups for Synthetic Cannabinoids

Linker Structure	Abbreviation	Formal Name
	A	**a**mide
	ATA	**a**ce**ta**minde

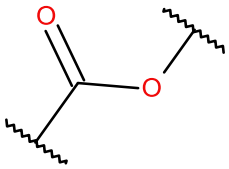
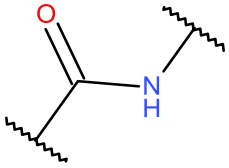
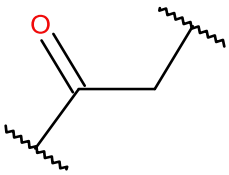
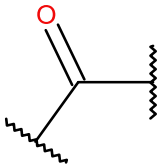
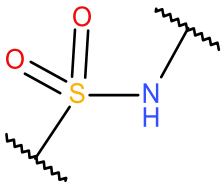
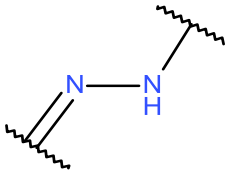
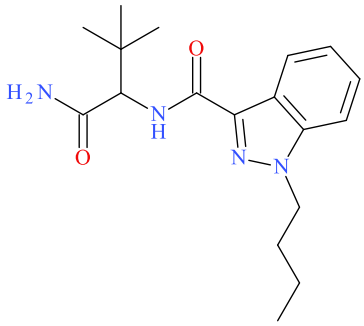
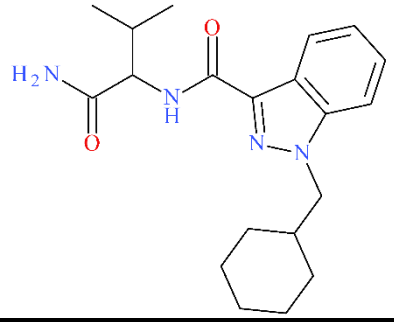
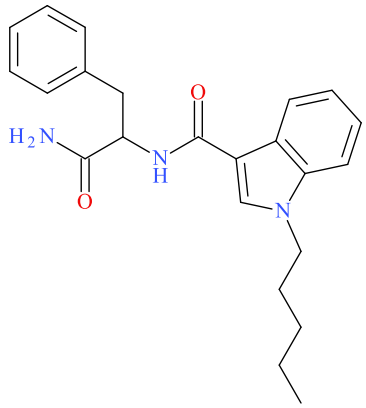
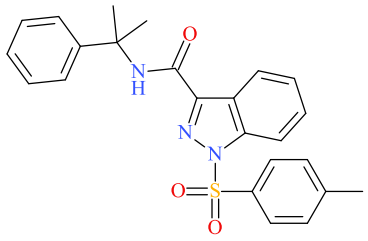
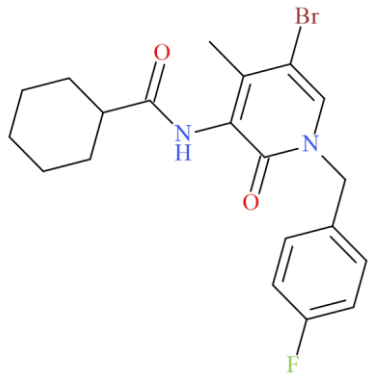
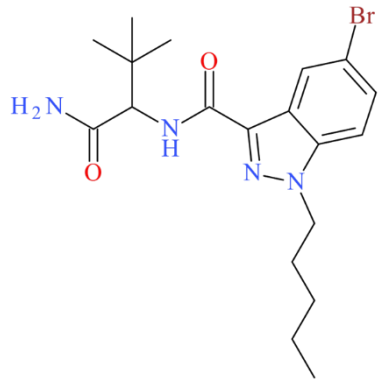
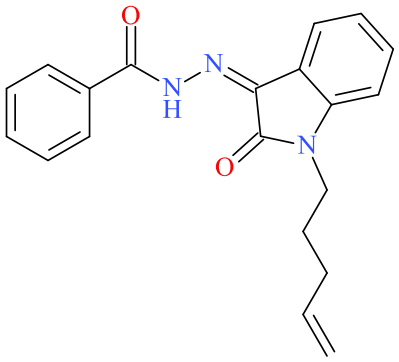
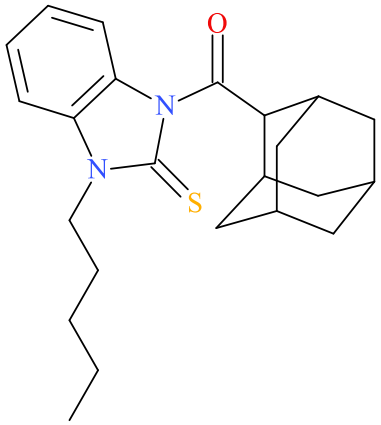
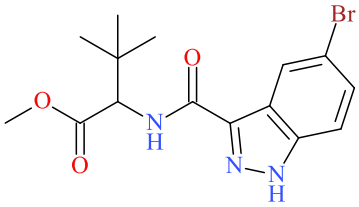
	C	**c**arboxylate
	CA	**c**arbox**a**mide
	E	**e**thanone
	MO	**m**ethan**o**ne
	SA	**s**ulphon**a**mide
	ZID	hydra**zid**e

Table 5: Examples of Naming for Select Synthetic Cannabinoids

Molecular Structure	Systematic Name	Formal Name
	ADB-BUTINACA	1-butyl-N-(1-carbamoyl-2,2-dimethyl-propyl)indazole-3-carboxamide
	AMB-CHMINACA	N-(1-carbamoyl-2-methyl-propyl)-1-(cyclohexylmethyl)indazole-3-carboxamide
	APP-PICA	N-(2-amino-1-benzyl-2-oxo-ethyl)-1-pentyl-indole-3-carboxamide
	CUMYL-TsINACA	N-(1-methyl-1-phenyl-ethyl)-1-(p-tolylsulfonyl)indazole-3-carboxamide

	CHO-4'Me-5'Br-FUBOXPYRA	N-[5-bromo-1-[(4-fluorophenyl)methyl]-4-methyl-2-oxo-3-pyridyl]cyclohexanecarboxamide
	ADB-5'Br-PINACA	5-bromo-1-butyl-N-(1-carbamoyl-2,2-dimethyl-propyl)indazole-3-carboxamide
	BZO-4en-POXIZID	N-[(Z)-(2-oxo-1-pent-4-enyl-indolin-3-ylidene)amino]benzamide

	A-PBITMO	(adamantan-1-yl)(3-pentyl-2-thioxo-2,3-dihydro-1H-benzo[d]imidazol-1-yl)methanone
	MDMB-5Me-INACA	methyl 3,3-dimethyl-2-[(5-methyl-1H-indazole-3-carbonyl)amino]butanoate

Formal Name: N-(1-amino-3-methyl-1-oxobutan-2-yl)-1-pentyl-1H-indazole-3-carboxamide.

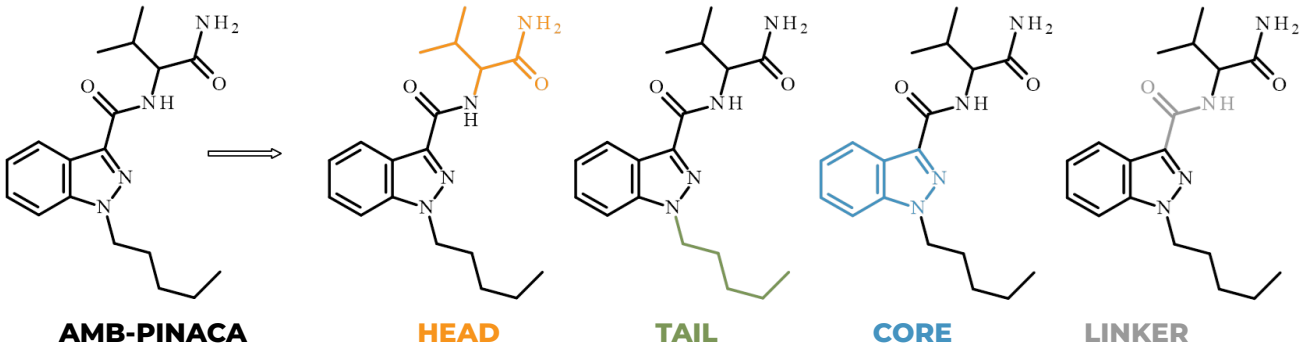


Figure 2: Name explained for AMB-PINACA (or AB-PINACA) using formal name and structure.

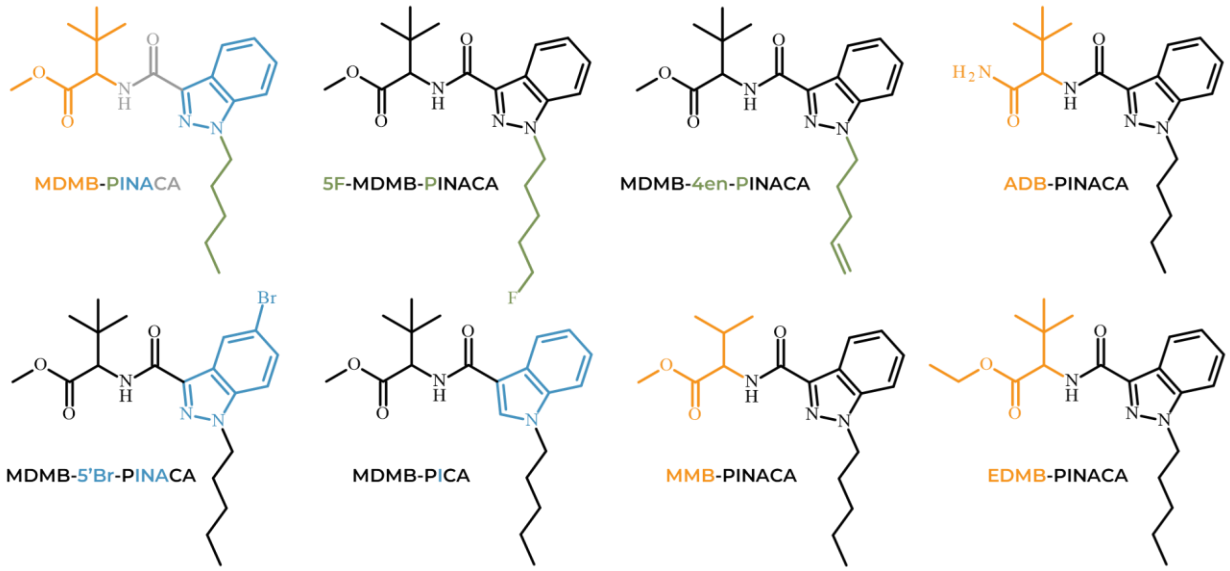


Figure 3: Illustrating the changes in synthetic cannabinoid names based on common head, core, and tail modifications by using MDMB-PINACA as an example.

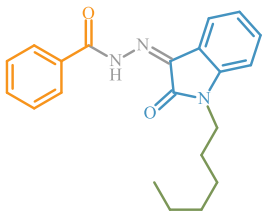
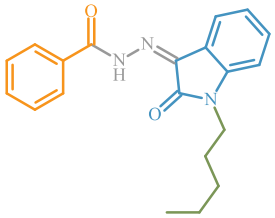
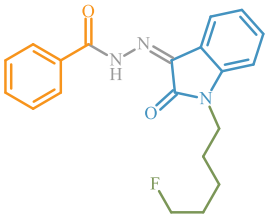
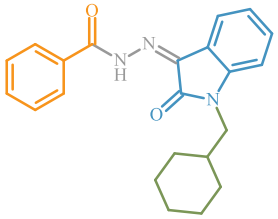
BZO-HEXOXIZID	BZO-POXIZID	5F-BZO-POXIZID	BZO-CHMOXIZID
			
(Z)-N'-(1-HEXyl-2-OXOIndolin-3-ylidene)BenZOhydraZIDe	(Z)-N'-(1-Pentyl-2-OXOIndolin-3-ylidene)BenZOhydraZIDe	(Z)-N'-(1-(5-FluoroPentyl-2-OXOIndolin-3-ylidene) BenZOhydraZIDe	(Z)-N'-(1-(CycloHexylMethyl)-2-OXOIndolin-3-ylidene) BenZOhydraZIDe
Name: BZO-HEXOXIZID	**Name:** BZO-POXIZID	**Name:** 5F-BZO-POXIZID	**Name:** BZO-CHMOXIZID
Synonyms: MDA-19, MDA19, MDA 19	**Synonyms:** 5C-MDA-19, MDA-19 pentyl analogue	**Synonyms:** 5F-MDA-19, MDA-19 5-fluoropentyl analogue	**Synonyms:** CHM-MDA-19, Cyclohexylmethyl MDA-19

Figure 4: Colored illustration showing how the alpha-numeric components of the formal chemical name are used to derive the semi-systematic names for the new synthetic cannabinoid subclass known as the "OXIZIDs".



About: With funding from the National Institute of Justice (NIJ), the Center for Forensic Science Research and Education (CFSRE) at the Fredric Rieders Family Foundation, in collaboration with Cayman Chemical, is developing and implementing standardized nomenclature and taxonomy in relation to novel psychoactive substance (NPS), with a focus on four main classifications: benzodiazepines, opioids, stimulants and hallucinogens, and synthetic cannabinoids. The goal of this specific initiative is to improve communications regarding NPS and help eliminate confusion by assigning preferred names and naming guides for future NPS.

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