Supplementary Information
For
Rapid Screening of New Psychoactive Substances Using pDART-QqQ-MS

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Experimental Procedures

Validation of Forensic Toxicological Methods

Each calibration point was run in quintuplicate. The normalized area for each analyte was calculated using the selected internal standard signal area (Supplementary Table S1). Linear calibration curves were constructed using a least square regression model with the spiked concentration (1/x) reciprocal as a weighting factor. The calibration parameter coefficient of determination (R^2) was used to roughly estimate the linearity. The limit of detection (LOD) was estimated using the ratio of the average normalized area with 3.3 times the standard deviation of blanks within five measurements. The lower limit of qualification (LLOQ) was defined as the standard's concentration that produced a bias within ±20%. For all the analytes, interference, carryover effect, accuracy, system precision, repeatability, matrix effect, and inter-day precision were evaluated at several different concentrations, including LLOQ. Interference was evaluated using blank urine samples from three males and four females at different ionization temperatures. Accuracy, expressed as bias%, compared the concentration calculated from the linear model and the nominal concentration. Precision, shown as the coefficient of variation (%CV), assessed the level of variation at each concentration. System precision was used to assess the stability of the pDART system within five measurements by a single testing sample. Method precision revealed the variation within three independent preparations. Matrix effect, or ion suppression, was investigated by comparing the 50% methanol spiked with the analytes with blank spiked samples. Inter-day precision was used to evaluate the stability of the prepared solution

The carryover effect was assessed by measuring the double blank solution (pooled urine without any intentional addition of analytes and internal standard) in the same testing set after the highest concentration samples (1000 $ngmL^{-1}$) used in calibration curves. Stability was investigated through the inter-day precision and method bias analyzed with the same test solution stored at -20°C for 3 days in quintuplicate. Quality controls were analyzed in triplicate at the concentrations 20, 40, 75, 200, 400, 750 ngmL-1, to confirm the deflection of the linearity against the default linearity within the range of 0.8-1.2.

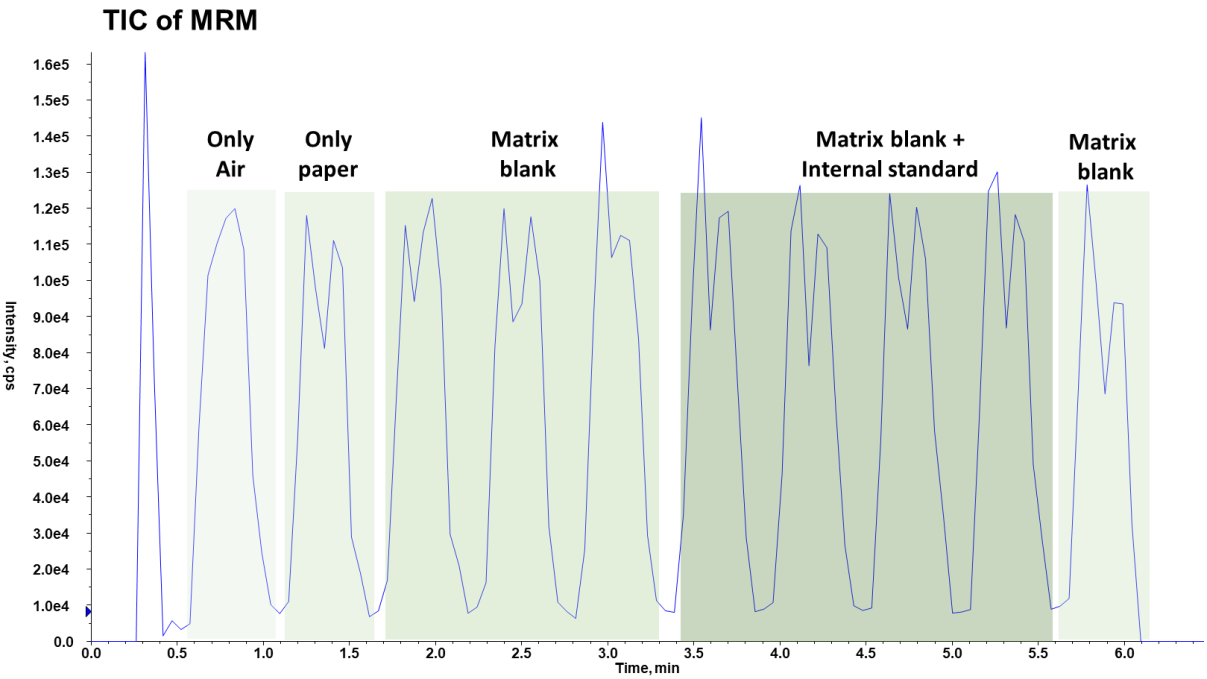


Figure S1. The total ion chromatogram (TIC) of MRM for air, paper, and matrix blank samples, with and without internal standard.

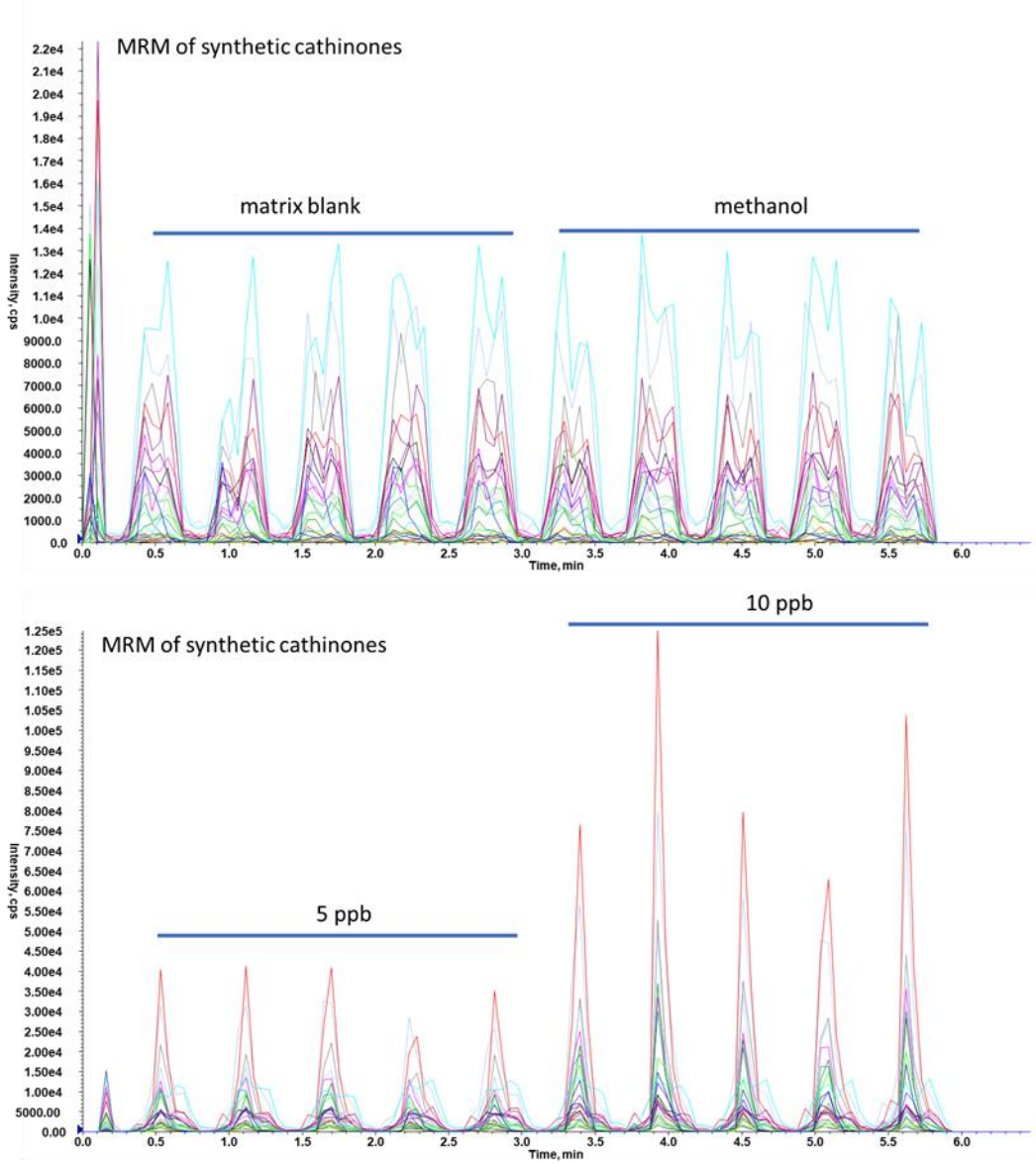
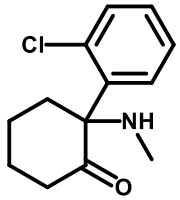
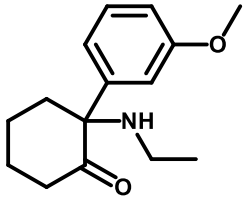
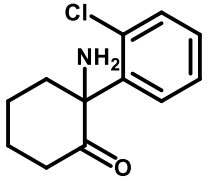
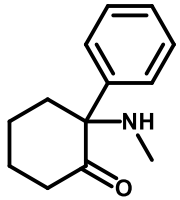
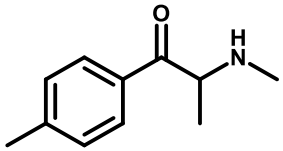
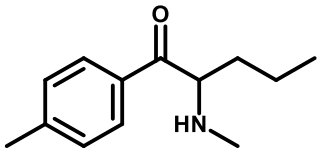
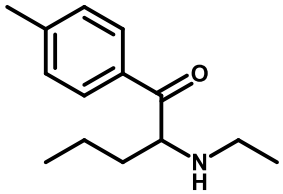
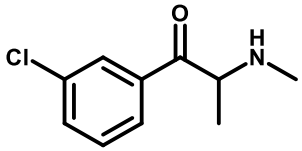
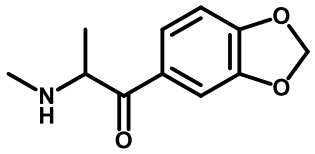
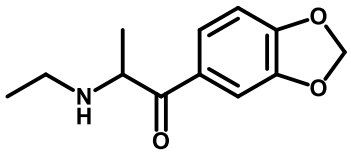
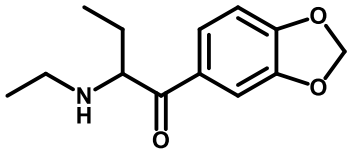
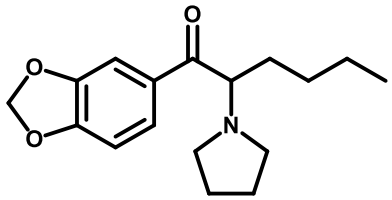
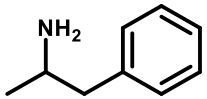
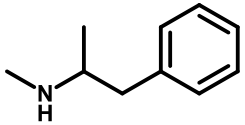
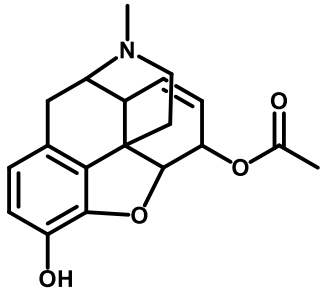
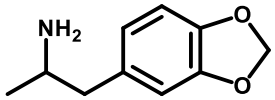
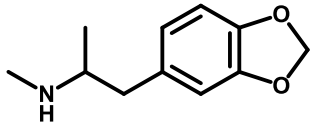


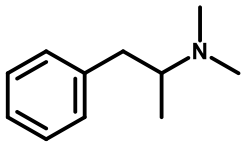
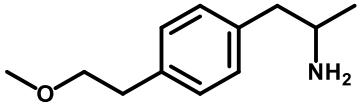
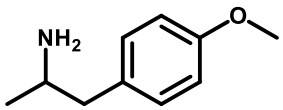
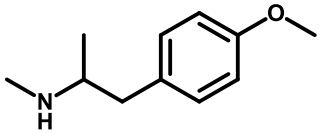
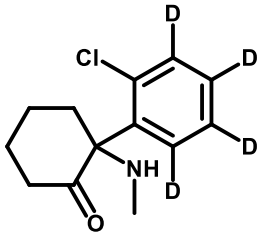
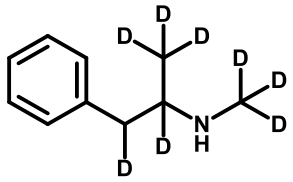
Figure S2. The MRM of synthetic cathinones for matrix blank, methanol, 5 ppb, and 10 ppb.

Supplementary Table S1. MRM transitions and experimental parameters for all analytes and internal standards

Compound		Precursor ion $[M + H]^+$	DP	EP	Fragment	*m/z*	CE	CXP	Internal standard	Normalization fragment	Ionization helium temperature
	Ketamine	238	80	10	Quantifier	125	40	10	Ketamine-D_4	242/129	300
					Qualifier	220	22	10			
	Methoxetamine	248	76	12	Quantifier	203	19	14	Ketamine-D_4	242/129	300
					Qualifier	121	39	8			
					Qualifier	175	25	12			
	Norketamine	224	70	10	Quantifier	179	22	9	Ketamine-D_4	242/129	300
					Qualifier	125	30	12			
	Deschloroketamine	204	65	10	Quantifier	173	19	12	Ketamine-D_4	242/129	300
					Qualifier	145	23	10			
					Qualifier	91	35	7			
	Mephedrone	178	80	10	Quantifier	145	18	10	Ketamine-D_4	242/129	300
					Qualifier	160	28	10			
					Qualifier	91	47	10			

	4-MPD	206	79	8	Quantifier Qualifier Qualifier	188 17 13 145 30 10 105 28 7	Ketamine-D_4	242/129	300
	MEAP	220	80	12	Quantifier Qualifier Qualifier Qualifier	202 19 14 105 31 7 160 25 11 175 20 12	Ketamine-D_4	242/129	300
	CMC	198	80	9	Quantifier Qualifier Qualifier	180 16 12 145 26 10 144 43 10	Ketamine-D_4	242/129	300
	Methylone	208	80	10	Quantifier Qualifier Qualifier	132 37 10 160 24 10 190 17 10	Ketamine-D_4	242/129	300
	Ephylone	250	72	11	Quantifier Qualifier Qualifier	202 25 14 232 20 9 189 33 13	Ketamine-D_4	242/129	300
	Eutylone	236	70	9	Quantifier Qualifier Qualifier	160 35 11 218 20 10 188 25 13	Ketamine-D_4	242/129	300

	3,4-MDPHP	290	102	7	Quantifier Qualifier Qualifier Qualifier	140 219 189 135	36 25 30 35	10 15 14 10	Ketamine-D_4	242/129	300
	Amphetamine	136	50	10	Quantifier Qualifier	91 119	21 11	10 10	Ketamine-D_4	242/129	300
	Methamphetamine	150	80	10	Quantifier Qualifier	119 91	13 30	10 10	Methamphetamine-D_8	158/93	300
	6-acetylmorphine	328	138	9	Quantifier Qualifier Qualifier	211 193 165	35 37 51	15 14 11	Methamphetamine-D_8	158/93	400
	MDA	180	55	10	Quantifier Qualifier	133 135	24 25	9 10	Methamphetamine-D_8	158/93	400
	MDMA	194	65	12	Quantifier Qualifier Qualifier	163 133 135	16 27 28	12 10 10	Ketamine-D_4	242/129	300

	DMA	164	70	11	Quantifier Qualifier Qualifier	91 119 65	27 17 56	6 8 8	Ketamine-D_4	242/129	300
	PMEA	194	66	9	Quantifier Qualifier Qualifier	121 149 91	30 17 46	9 11 10	Ketamine-D_4	242/129	300
	PMA	166	53	7	Quantifier Qualifier Qualifier	121 91 78	26 40 53	10 8 10	Ketamine-D_4	242/129	300
	PMMA	180	56	13	Quantifier Qualifier Qualifier	149 91 78	16 42 53	10 9 10	Ketamine-D_4	242/129	300
	Ketamine-D_4	242	80	10		129	38	10	Internal standards		300
	Methamphetamine-D_8	158	62	8		93 124	18 35	7 9			400

Supplementary Table S2. Validation results, linear parameters, LOD, and other validation parameters were assessed at LLOQ, 400, and 750 $ngmL^{-1}$ levels.

Compound	Linearity					LLOQ							QC 400 $ngmL^{-1}$						QC 750 $ngmL^{-1}$					
	Range	Slope	Intercept	R square	Cal LOD ($ngmL^{-1}$)	Conc. ($ngmL^{-1}$)	System precision (%CV)	Method precision (%CV)	Accuracy (%Bias)	Matrix Effect (%)	Inter-day precision (%CV)	Stability (%Bias)	System precision (%CV)	Method precision (%CV)	Accuracy (%Bias)	Matrix Effect (%)	Inter-day precision (%CV)	Stability (%Bias)	System precision (%CV)	Method precision (%CV)	Accuracy (%Bias)	Matrix Effect (%)	Inter-day precision (%CV)	Stability (%Bias)
Ketamine	5-1000	8.86E-03	4.63E-03	0.9916	2.00	20	2.65	6.31	1.72	116.75	10.96	11.63	2.77	15.71	1.35	105.47	18.27	4.64	3.52	7.94	1.43	89.97	6.06	-2.01
Methoxetamine	1-1000	1.53E-02	2.16E-03	0.9912	3.06	20	4.62	7.85	-1.40	106.05	8.63	7.38	3.18	15.28	0.75	115.76	21.14	20.36	5.82	7.92	0.84	101.77	11.51	11.35
Norketamine	1-1000	6.88E-03	1.78E-03	0.9938	3.92	50	5.69	12.76	-3.86	139.32	10.44	3.96	4.83	12.44	-0.30	145.55	17.43	13.81	7.18	7.89	1.24	113.36	8.55	-6.74
Deschloroketamine	1-1000	7.83E-03	1.09E-03	0.9916	2.44	50	3.77	13.07	-3.17	87.53	10.81	-6.03	9.56	-3.34	20.17	86.69	11.92	6.21	4.71	7.12	3.84	65.92	11.11	-10.63
Mephedrone	10-1000	3.44E-03	1.70E-03	0.9867	6.43	20	6.87	16.40	-1.8 7	42.44	12.39	6.12	5.15	10.42	-0.01	39.26	12.29	-1.57	4.34	9.83	1.14	49.11	10.02	7.04
4-MPD	10-1000	5.97E-02	7.56E-02	0.9874	8.91	20	12.56	16.88	12.16	105.05	5.52	-7.57	13.41	16.98	-5.89	73.60	19.84	-5.94	9.71	17.40	-1.39	86.78	19.71	-11.04
MEAP	5-1000	7.64E-02	4.07E-02	0.9923	3.97	20	5.21	9.06	0.58	103.45	8.58	-4.72	9.35	12.81	2.76	77.33	18.02	-8.65	8.14	15.72	3.51	90.75	14.45	-9.83
CMC	10-1000	4.67E-03	-2.68E-03	0.9929	9.52	20	7.86	18.98	-4.20	43.13	16.77	10.13	7.03	13.68	-2.78	44.96	18.80	15.98	6.95	14.70	-1.12	56.43	7.15	13.38
Methylone	10-1000	1.53E-03	2.77E-03	0.9828	28.75	50	5.35	10.54	-0.69	49.45	17.01	10.41	4.56	10.66	1.99	35.27	12.97	8.81	6.51	12.20	5.68	46.46	11.23	-3.55
Ephylone	1-1000	1.46E-02	3.23E-04	0.9913	0.38	20	6.64	16.41	-3.32	63.77	9.31	1.62	10.05	18.05	-8.55	54.03	18.69	-8.94	12.88	19.02	1.39	65.32	19.02	-14.11
Eutylone	10-1000	1.53E-03	1.85E-03	0.9862	11.81	20	5.44	16.94	7.13	43.86	13.81	-2.43	10.24	18.56	5.96	42.62	20.84	-5.46	5.35	16.05	-7.47	44.00	15.25	-4.97
3,4-MDPHP	1-1000	6.56E-03	-3.23E-04	0.9830	0.42	20	4.14	13.15	-4.50	96.76	11.38	0.06	10.81	26.07	-6.52	64.47	22.86	13.16	6.00	24.11	-10.57	76.88	19.63	-21.56
Amphetamine	10-1000	7.41E-03	8.84E-02	0.8343	113.33	75	10.14	18.36	54.38	143.61	25.70	-17.07	5.41	10.91	2.39	121.03	12.89	11.74	3.49	19.55	-7.08	120.00	27.32	-5.53
Methamphetamine	5-1000	3.68E-03	1.02E-03	0.9909	5.94	20	3.08	14.39	-0.65	122.20	15.23	9.79	8.02	11.34	3.39	107.80	13.19	-0.85	10.80	18.36	4.37	107.08	12.50	-5.21
6-acetylmorphine	10-1000	2.48E-04	1.56E-03	0.9321	66.39	50	17.80	28.39	19.62	136.49	23.96	2.83	20.83	25.07	0.36	109.42	23.61	-2.73	15.36	21.11	-8.08	71.52	32.72	10.30
MDA	10-1000	8.92E-04	3.05E-03	0.9822	21.46	50	10.51	21.99	0.15	102.18	10.75	2.76	8.46	16.43	5.27	114.31	18.63	1.12	13.06	14.89	-6.91	65.62	25.32	-19.25
MDMA	5-1000	2.07E-03	1.08E-05	0.9958	3.21	20	7.79	15.26	4.23	52.17	11.53	12.94	8.29	8.85	-0.48	53.30	17.18	-8.26	13.71	16.39	7.08	47.61	29.30	8.42
DMA	10-1000	1.24E-02	2.85E-02	0.9836	25.26	50	4.07	14.12	4.19	101.47	6.66	-0.94	8.06	12.79	-4.08	94.46	8.14	14.17	5.96	10.54	-2.59	102.36	7.22	4.14
PMEA	10-1000	7.21E-03	2.59E-02	0.9781	25.84	50	9.64	12.04	14.66	126.83	14.54	4.90	7.93	9.19	-3.90	95.33	9.82	12.77	6.11	9.14	-2.05	103.73	9.29	13.04
PMA	10-1000	3.64E-03	1.09E-02	0.9822	38.83	50	14.08	17.56	8.76	136.59	15.52	14.85	2.98	13.42	-6.19	97.28	13.85	-17.60	7.30	13.09	-3.39	111.45	8.26	5.06
PMMA	1-1000	6.32E-03	7.12E-04	0.9963	2.41	20	3.76	14.44	0.15	99.57	16.01	-1.90	5.47	12.87	1.45	90.20	12.41	21.71	13.38	17.18	-5.55	97.36	9.68	7.32

Supplementary Table S3. The results from 40 real urine samples of drug-abused subjects were analyzed using both LC-QqQ-MS and pDART-QqQ-MS methods.

Compound	LC-QqQ-MS ($ngmL^{-1}$)	pDART-QqQ-MS ($ngmL^{-1}$)	No.	pDART-QqQ-MS area ratio ($Area_{Analyte}/Area_{Internal\ standard}$)					
				Triple			Mean	SD	CV%
Ketamine	2784.9	772.54	#01	7.04	7.13	6.35	6.84	0.06	0.91
	3130.9	1244.35	#03	10.63	10.55	11.86	11.01	0.07	0.61
	9404.2	3897.80	#04	35.47	34.26	33.71	34.48	0.03	0.08
	343.3	140.70	#08	1.23	1.32	1.20	1.25	0.05	4.07
	1526.1	592.73	#10	4.88	5.46	5.41	5.25	0.06	1.15
	710.2	279.69	#11	2.45	2.51	2.49	2.48	0.01	0.49
	70.8	50.77	#14	0.53	0.49	0.35	0.46	0.22	47.29
	1427.7	633.85	#15	5.57	5.96	5.31	5.61	0.06	1.05
	6050.7	2110.28	#18	24.32	14.69	17.00	18.67	0.27	1.44
	914.2	506.71	#21	4.43	4.25	3.46	4.04	0.13	3.13
	1154.7	1056.36	#28	8.53	9.13	7.61	8.42	0.09	1.08
	35.7	33.74	#29	0.29	0.32	0.22	0.28	0.17	62.57
	1019.2	566.94	#31	5.26	4.26	4.06	4.52	0.14	3.15
	10516.9	7488.92	#32	60.22	69.16	49.67	59.68	0.16	0.27
	39.5	25.27	#36	0.18	0.29	0.16	0.21	0.34	160.90
	439.9	277.06	#39	2.43	1.83	2.39	2.21	0.15	6.89
Norketamine	844.8	306.35	#01	2.26	2.34	1.73	2.11	0.16	7.50
	4334.3	2601.00	#03	16.43	20.25	16.88	17.85	0.12	0.65
	8112	3190.60	#04	22.07	20.96	22.67	21.90	0.04	0.18
	128.8	206.47	#08	1.43	1.47	1.36	1.42	0.04	2.73
	1598.7	568.06	#10	4.16	3.71	3.84	3.90	0.06	1.54
	438.7	314.44	#11	2.23	2.31	1.96	2.16	0.08	3.91
	100.9	69.99	#14	0.42	0.55	0.48	0.49	0.14	28.13
	263	188.38	#15	1.38	1.15	1.37	1.30	0.10	7.58
	6445.8	2725.27	#18	26.57	12.65	16.90	18.71	0.38	2.04
	933.6	512.90	#21	3.17	3.29	3.74	3.40	0.09	2.59
	772.8	1181.91	#28	9.11	7.40	6.96	7.82	0.15	1.86
	160.1	114.36	#29	0.69	0.94	0.67	0.77	0.20	25.98
	973.9	318.38	#31	1.79	2.75	1.81	2.12	0.26	12.22
	3858.9	3682.53	#32	21.56	24.65	26.86	24.36	0.11	0.45
	23.7	11.91	#33	0.09	0.09	0.09	0.09	0.03	28.33

	25	23.76	#35	0.16	0.17	0.17	0.17	0.02	13.49
	68.2	36.65	#36	0.25	0.29	0.22	0.25	0.15	58.91
	311.9	102.12	#39	0.58	0.79	0.69	0.69	0.16	22.98
Deschloroketamine	37.4	15.45	#03	0.11	0.12	0.15	0.13	0.18	146.79
	289.3	94.53	#04	0.72	0.76	0.75	0.74	0.03	3.99
	19.5	7.65	#08	0.07	0.06	0.07	0.06	0.03	49.56
	25.7	12.09	#11	0.10	0.11	0.09	0.10	0.06	62.03
Mephedrone	95536.3	156204.31	#01	556.72	550.31	506.33	537.79	0.05	0.01
	53108.8	72439.49	#02	251.64	253.18	243.38	249.40	0.02	0.01
	1072.5	954.03	#07	0.38	0.54	0.46	0.46	0.17	37.58
	100.9	133.22	#08	0.04	0.05	0.05	0.05	0.15	328.16
	37001.3	19555.64	#13	73.04	61.28	67.67	67.33	0.09	0.13
	141.6	274.47	#19	0.64	1.16	1.04	0.95	0.29	30.43
	55418.4	52924.94	#21	142.60	136.20	142.70	140.50	0.03	0.02
	13625.7	66475.70	#26	276.80	125.60	127.00	176.47	0.49	0.28
	435.8	463.80	#29	0.94	1.98	0.85	1.26	0.50	39.88
	27186.4	144954.55	#31	259.50	346.40	548.40	384.77	0.39	0.10
	37.9	727.02	#33	1.59	2.45	1.83	1.96	0.23	11.65
	24897.5	11929.82	#35	19.40	35.00	40.67	31.69	0.35	1.10
	39.8	62.18	#36	0.09	0.27	0.21	0.19	0.50	263.97
	49266.7	211565.50	#39	323.70	653.20	707.80	561.57	0.37	0.07
Methylone	112.4	107.71	#13	0.17	0.17	0.17	0.17	0.01	7.68
	2444.2	2714.90	#14	4.35	4.33	3.82	4.16	0.07	1.74
MEAP	1449.2	629.64	#01	47.01	50.52	46.86	48.13	0.04	0.09
	30485.4	19902.32	#02	2028.32	1349.69	1180.56	1519.52	0.30	0.02
	7.5	6.81	#08	0.46	0.72	0.55	0.58	0.23	40.45
Ephylone	16.5	27.70	#02	0.52	0.37	0.33	0.41	0.25	62.66
	8510.1	8896.85	#37	123.80	135.70	78.49	112.66	0.27	0.24
Eutylone	157909	152115.18	#01	260.29	196.37	240.93	232.53	0.14	0.06
	70680.6	52775.05	#02	108.92	76.23	56.88	80.67	0.33	0.40
	2099.1	562.13	#07	0.71	0.83	1.04	0.86	0.19	22.17
	5946.1	850.71	#08	1.15	1.41	1.35	1.30	0.10	7.94
	124155.2	164521.00	#09	261.15	258.32	235.00	251.49	0.06	0.02
	26110.3	12782.51	#14	17.15	22.13	19.35	19.54	0.13	0.65
	30.9	34.71	#19	0.05	0.06	0.06	0.05	0.15	273.08
	76488.1	75717.66	#21	94.99	94.24	60.96	83.40	0.23	0.28

	2820.9	11133.27	#23	11.66	13.26	11.88	12.27	0.07	0.58
	7838.1	15530.90	#26	17.69	17.23	16.41	17.11	0.04	0.22
	20027.9	35485.21	#31	41.27	31.60	44.39	39.09	0.17	0.44
	28142.2	66444.19	#33	75.68	83.83	60.04	73.18	0.17	0.23
	77645.7	77067.52	#34	107.80	71.84	75.01	84.88	0.23	0.28
	5347.2	1598.30	#35	1.10	2.23	1.96	1.77	0.33	18.94
	29718.9	47891.20	#39	57.80	44.02	56.43	52.75	0.14	0.27
Amphetamine	216.7	114.33	#05	1.10	1.09	0.62	0.94	0.30	31.71
	29980.9	16805.98	#06	126.17	118.72	128.99	124.63	0.04	0.03
	9353.9	4898.00	#12	30.19	38.95	40.02	36.38	0.15	0.41
	21.8	90.41	#16	1.00	0.85	0.43	0.76	0.39	51.85
	2503.2	753.34	#17	5.52	5.89	5.61	5.67	0.03	0.61
	1404.5	452.63	#20	3.59	3.10	3.64	3.44	0.09	2.50
	6434.5	7021.00	#22	44.70	61.38	65.19	57.09	0.19	0.33
	909.9	1230.81	#24	12.64	10.39	7.84	10.29	0.23	2.27
	4184.2	2040.88	#32	11.33	18.82	20.36	16.84	0.29	1.70
	112.1	101.00	#36	1.28	1.18	1.01	1.16	0.12	10.42
	584.1	308.06	#38	1.73	2.30	4.46	2.83	0.51	17.95
Methamphetamine	134.5	70.24	#01	0.41	0.55	0.38	0.45	0.21	46.03
	158.1	43.09	#05	0.31	0.38	0.19	0.29	0.34	115.08
	109309.4	51249.00	#06	338.51	264.79	270.58	291.29	0.14	0.05
	78.6	861.76	#09	4.37	6.99	4.35	5.23	0.29	5.54
	44932.9	26269.80	#12	164.25	242.13	166.43	190.93	0.23	0.12
	51.5	28.21	#16	0.16	0.18	0.24	0.19	0.22	114.47
	24070.4	8463.13	#17	45.89	56.66	49.39	50.65	0.11	0.21
	25.9	7.57	#19	0.04	0.05	0.10	0.06	0.55	925.07
	13200.8	4252.03	#20	21.53	31.14	27.88	26.85	0.18	0.68
	19.9	183.49	#21	3.04	1.15	2.21	2.13	0.45	20.90
	24121.4	18707.30	#22	132.10	226.40	229.60	196.03	0.28	0.14
	5222.3	4825.30	#24	51.64	54.89	45.63	50.72	0.09	0.18
	6.3	262.82	#25	2.21	1.85	4.82	2.96	0.55	18.50
	85.7	119.87	#29	1.11	2.17	1.12	1.46	0.42	28.44
	13669.1	8299.15	#32	68.72	82.13	110.40	87.08	0.24	0.28
	209.9	211.71	#34	2.25	2.49	2.54	2.43	0.06	2.65
	2443.3	1303.38	#36	17.30	13.15	11.11	13.85	0.23	1.64
	2	66.41	#37	1.27	0.95	0.50	0.91	0.43	47.22

	1658.9	813.84	#38	5.44	6.50	14.25	8.73	0.55	6.31
6-acetylmorphine	441.9	367.98	#30	0.13	0.08	0.05	0.09	0.46	537.32
MDMA	4.5	24.27803748	#25	0.04	0.02	0.04	0.03	0.35	1014.27
DMA	630.8	474.05	#06	3.95	3.96	4.62	4.18	0.09	2.23
	155.5	166.92	#12	1.48	1.40	1.60	1.49	0.07	4.37
	30.9	39.17	#17	0.38	0.37	0.39	0.38	0.04	9.27
	13.7	2.23	#20	0.16	0.15	0.14	0.15	0.07	46.41
	1265	2316.35	#22	15.26	20.56	16.06	17.29	0.17	0.96
	48.6	190.01	#32	1.37	1.37	1.65	1.46	0.11	7.53
PMA	2716.9	1490.70	#13	4.24	4.37	3.63	4.08	0.10	2.38
	132.1	168.72	#29	0.31	0.71	0.38	0.47	0.46	98.32
PMMA	654.6	647.76	#29	1.64	4.20	2.12	2.65	0.51	19.38

Supplementary Table S4. Comparison of quantitative results of pDART screen and LC-MS/MS confirmation

Compound	Number	Correlation coefficient	Equation	Slope (95%CI)	Intercept (95%CI)
Ketamine	16	0.937	Y = 0.5497*X - 129.5	0.4327 to 0.6667	-602.7 to 343.6
Norketamine	18	0.903	Y = 0.4610*X + 144.7	0.3449 to 0.5770	-187.2 to 476.7
Deschloroketamine	4	1.000	Y = 0.3166*X + 2.991	0.2912 to 0.3421	-0.7427 to 6.725
Mephedrone	14	0.712	Y = 1.705*X + 9191	0.6483 to 2.761	-31088 to 49470
MEAP	3	1.000	Y = 0.6577*X - 156.9	0.5374 to 0.7781	-2277 to 1964
Eutylone	15	0.949	Y = 1.029*X + 4069	0.8235 to 1.235	-8954 to 17091
Amphetamine	11	0.976	Y = 0.5643*X + 216.5	0.4691 to 0.6595	-715.4 to 1148
Methamphetamine	19	0.985	Y = 0.4835*X + 541.1	0.4399 to 0.5271	-705.6 to 1788
DMA	6	0.952	Y = 1.688*X - 71.91	0.9336 to 2.443	-510.3 to 366.5
Overall	59	0.807	Y = 1.663*X + 731.0	1.253 to 2.073	-6676 to 8138

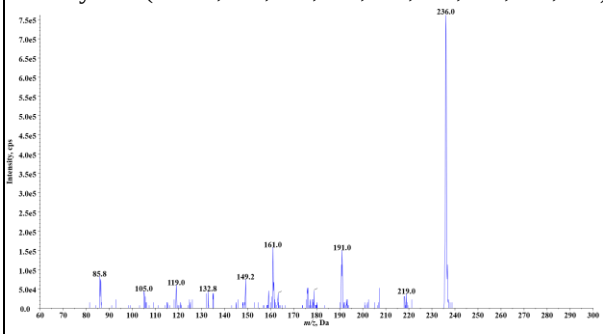
Supplementary Table S5. The overall weighted Kappa coefficient between pDART-QqQ-MS and LC-QqQ-MS when the data was separated into six concentration levels

LC-MS/MS Quantitative result ($ngmL^{-1}$)	pDART-QqQ-MS Quantitative result ($ngmL^{-1}$)					
	<50	50-200	200-500	500-1000	1000-10000	>10000
<50	15	4	1	0	0	0
50-200	2	9	1	0	0	0
200-500	0	5	5	2	0	0
500-1000	0	0	5	3	2	0
1000-10000	0	0	1	11	18	2
>10000	0	0	0	0	4	22

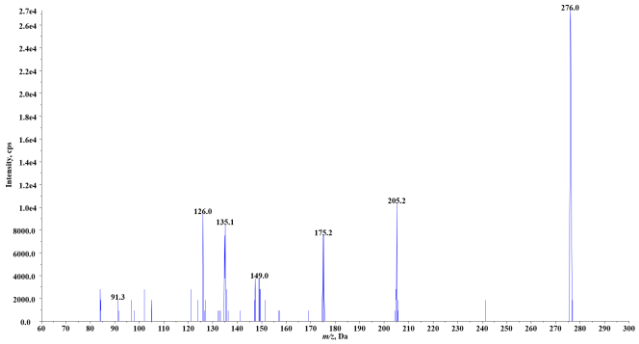
Supplementary Table S6. PI-IDA-EPI experimental parameters and Fragmentation of the analytes detected in precursor ion scan

PI				**IDA**	**EPI**		
m/z	Range	DP	CE		*m/z*	DP	CE
135 70 125	100-400	60	35 25 25	1. Select 1 to 4 most intense peaks, 2. Intensity exceed 1.0E+0.4, 3. Always exclude former target ions	80-300	60	25

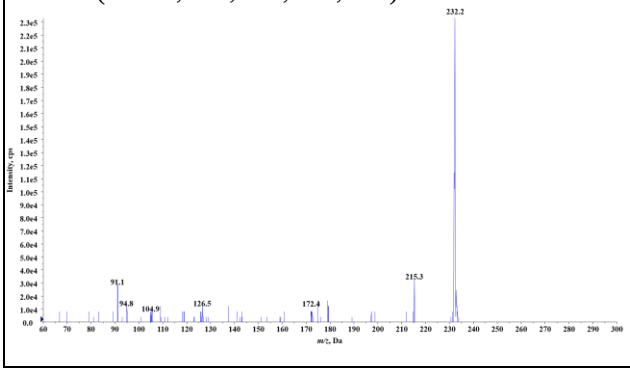
Dibutylone (*m/z* 86, 105, 119, 133, 149, 161, 191, 219, 236)



MDPV (*m/z* 126, 135, 149, 175, 205, 276)



α-PVP (*m/z* 91, 137, 161, 215, 232)



4-chloro-α-PVP (*m/z* 84, 125, 139, 153, 194, 205, 266)