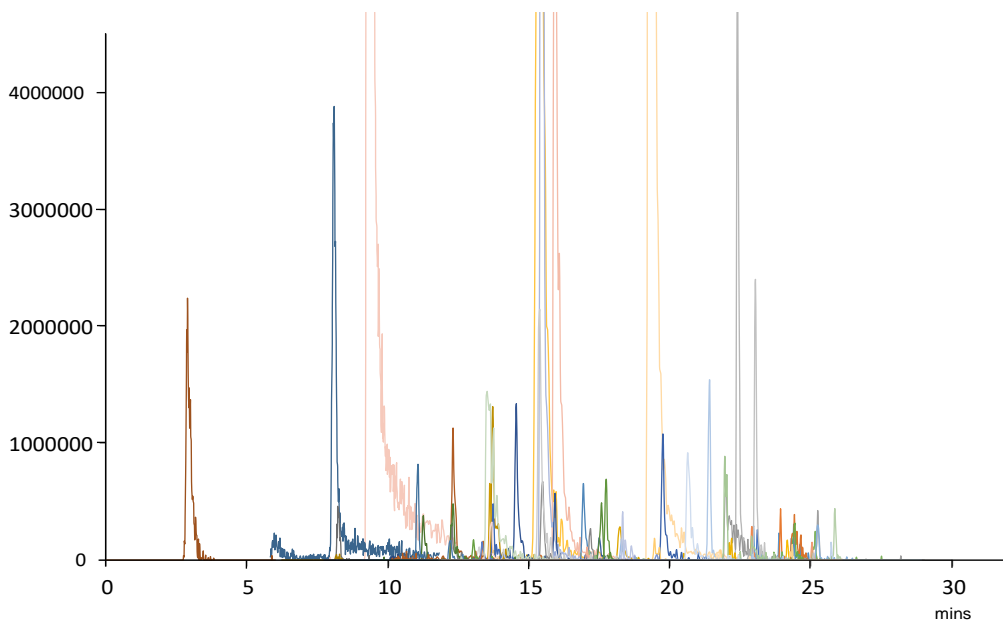


# Application note #4140

## Drugs of Abuse Screen (250 Analytes) in Urine by LC-MS/MS



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# Method Details

## CONDITIONS

Column: Avantor® ACE® Excel® 2 C18-PFP  
 Particle Size: 2 µm  
 Dimensions: 100 x 2.1 mm  
 Mobile Phase: A: 2 mM ammonium acetate + 0.1% formic acid in H<sub>2</sub>O  
 B: 2 mM ammonium acetate + 0.1% formic acid in MeOH

Gradient:

Time (mins)	% B
0	2
4	2
34	100
38	100
40	2

Flow Rate: 0.3 mL/min  
 Injection: 10 µL  
 Temperature: 37 °C  
 Detection: Thermo Quantum Ultra MS  
 ESI in positive ion mode

## MRM TRANSITIONS

Analytes in light blue are included in the Extracted Ion Chromatogram on page 1

Analyte	R <sub>t</sub>	MRM Transitions
6-Acetylcodeine	16.9	342.2 > 165.1
Alfentanil	21.1	417.4 > 197.2
Alprazolam	23.3	309.11 > 205.1
Aminoclonazepam	13.9	286.2 > 222.3
Aminodesmethylflunitrazepam	20.0	270.1 > 121.1
Aminoflunitrazepam	16.2	284.1 > 135.1
Aminonitrazepam	10.9	252.1 > 94.1
Aminorex	12.2	163 > 120.1
Amiodarone	31.3	646.2 > 100
Amisulpride	16.2	370.1 > 242
Amitriptyline	24.4	278.2 > 91.1
Amlodipine	25.3	409.3 > 238.2
Amlodipine met	22.9	407 > 318

Analyte	R <sub>t</sub>	MRM Transitions
Amphetamine	11.6	136.1 > 65.2
Amphetamine-d6	11.6	142.2 > 67.2
Anhydroecgonine methyl ester	9.8	182.2 > 91.1
Aripiprazole	25.5	448.1 > 285.1
Atenolol	10.7	267.1 > 145.1
Atomoxetine	23.1	256.2 > 44.1
Atomoxetine metabolite	22.5	242.2 > 44.1
Benzedrone	21.7	254 > 65.1
Benzoylecgonine	15.6	290.1 > 77.2
Benzoylecgonine-d3	15.6	293.2 > 77.2
Benzylpiperazine	5.1	177.2 > 65.1
Bisoprolol	19.9	326.3 > 116.1
Bromazepam	20.4	316 > 182.1

Analyte	R <sub>t</sub>	MRM Transitions
Buphedrone	14.2	178.2 > 160.1
Buphedrone ephedrine	13.5	180.4 > 162.2
Bupivacaine	19.5	289.2 > 84.2
Buprenorphine glucuronide	18.1	644.4 > 468.4
Bupropion	19.5	240.1 > 131.1
Butylone	14.7	222.1 > 131.1
Caffeine	13.1	195.1 > 110.1
Camfetamine	18.7	202.2 > 67.1
Carbamazepine	21.5	237.1 > 192.2
Carbamazepine 10,11-Epoxyde	18.6	253.2 > 180.1
Cathine	20.0	134.2 > 91.1
Cathinone	9.5	150.2 > 117.1
2C-B-FLY	20.1	286 > 269.1
Chlordiazepoxide	19.5	300.1 > 227.1
Chloroquine	18.5	320.1 > 142.1
Chlorpheniramine	20.4	275.1 > 167.2
Chlorpromazine	25.9	319.2 > 58.1
Citalopram	22.2	325.1 > 246.1
Clobazam	22.8	301.1 > 259.2
Clomethiazole	17.3	161.9 > 113
Clomipramine	27.0	315.1 > 86.1
Clonazepam	23.1	316.1 > 214.2
Clonidine	13.2	230 > 44.2
Clozapine	21.7	327.1 > 192.1
Cocaehtylene	19.5	318.2 > 82.2
Cocaine	18.0	304.2 > 82.2
Codeine	11.9	300.2 > 153.2
Cotinine	2.5	177.1 > 80.1
Creatinine	1.3	114 > 44
Cyclizine	22.5	267.1 > 167.1
D2PM (Diphenylprolinol)	7.3	254.1 > 130.1
Dehydroaripiprazole	25.3	446.1 > 285.1
Desimipramine	24.3	267.1 > 72.2
N-Desmethylclozapine	21.0	313 > 192.1
Desmethylcitalopram	22.4	311.1 > 109.1
Desmethylflunitrazepam	22.5	300.1 > 254.2
Desmethylfluoxetine	25.4	296.2 > 134.1
N-Desmethyilmirtazapine	16.1	252.1 > 195.1
Desmethylolanzapine	12.6	299.1 > 198.1
N-Desmethyltramadol	16.7	250.1 > 44.2
O-Desmethyltramadol	12.8	250.1 > 58.2
Desmethylvenlafaxine	15.5	264.3 > 58.1
N-Desmethylzopiclone	20.0	375.1 > 245.1
Desomorphine	13.1	272.1 > 152.1
Desoxyipradrol	20.5	252.1 > 91.1

Analyte	R <sub>t</sub>	MRM Transitions
Dextromethorphan	20.0	272.2 > 171.1
Diamorphine	16.9	370.1 > 165.1
Diazepam	25.5	285.1 > 154.1
Didesmethylcitalopram	22.2	297 > 262.1
Digoxin	24.2	781.2 > 97
Dihydrocodeine	11.7	302.2 > 128.1
Diltiazem	22.7	415.1 > 178.1
Dimethocaine	16.3	279.3 > 92.1
Dinitrophenol	18.4	183 > 109
Diphenhydramine	21.2	256.1 > 167.1
Dipipanone	25.0	350.2 > 265.2
Donepezil	22.2	380.1 > 91
Dothiepin	23.7	296.2 > 202.2
Ecgonine ethyl ester	2.5	214.1 > 196.1
Ecgonine methyl ester	1.0	200.1 > 182.1
EDDP	21.4	278.2 > 219.2
Estazolam	22.5	295.1 > 267.1
Ethylamphetamine	14.5	164.1 > 91.2
Ethylmethcathinone	15.8	192.2 > 131.2
Ethylphenidate	19.2	248.1 > 56.2
Etizolam	23.5	343.1 > 314.2
Fenfluramine	20.3	232.1 > 159.1
Fentanyl	21.4	337.2 > 105.1
Flubromazolam	23.2	371.1 > 223.1
Flunitrazepam	23.5	314.1 > 269.3
2-Fluoroamphetamine	13.2	154.1 > 83.1
Fluoroamphetamine interferent	10.6	154 > 67.1
3-Fluoromethcathinone	20.0	182.1 > 149.1
4-Fluoromethcathinone	20.0	182 > 148.1
Fluoxetine	25.3	310.1 > 44.2
Fluphenazine	28.1	438.3 > 143.1
Flurazepam	21.6	388 > 315
Fluvoxamine	26.0	319.1 > 71
Gabapentin	10.5	172.1 > 67.2
Glibenclamide	28.2	494.1 > 168.9
Gliclazide	24.6	324.1 > 110
Glimepiride	28.4	491.1 > 126
Glipizide	24.5	446.1 > 286
Haloperidol	23.1	376.1 > 95.1
Hippuric acid	10.9	180 > 77
Hydrocodone	13.1	300.1 > 199.1
Hydromorphone	10.4	286.2 > 185.1
Hydroxyalprazolam	22.4	325.1 > 216.1
4-Hydroxyamphetamine	5.4	152.1 > 107.1

# AVANTOR® ACE® APPLICATION NOTE #4140

Analyte	R <sub>t</sub>	MRM Transitions
Hydroxybupropion	18.5	253.1 > 130.1
4-Hydroxymethamphetamine	20.0	166.1 > 107.1
8-Hydroxymirtazapine	15.6	282.1 > 211
7-Hydroxymirtazapine	18.2	415.3 > 175.1
3-Hydroxyphenazepam	23.3	366.9 > 320.8
7-Hydroxyquetiapine	15.3	400.3 > 208.1
9-Hydroxyrisperidone	19.5	427.2 > 69.1
Imipramine	24.2	281.1 > 86.2
5-Iodo-2-aminoindane	18.4	260.1 > 115.1
Ketamine	15.4	238.1 > 125.1
Lamotrigine	16.8	256.1 > 211.1
Levamisole	13.3	205.1 > 91.1
Levetiracetam	8.9	171.2 > 126.1
Lidocaine	14.8	235.1 > 86.2
Lorazepam	22.8	321 > 229.1
Lormetazepam	23.8	335 > 289.1
LSD	20.1	324.3 > 223.1
MCAT	5.4	164.2 > 130.1
mCPP	17.0	197.1 > 118.1
MDA	13.4	180.1 > 133.1
MDAI	12.3	178.19 > 161.1
MDEA	15.2	208.1 > 135.1
MDMA	14.1	194.1 > 135.2
MDPV	18.1	276.1 > 135.1
MEGX	13.4	207.1 > 58.1
MeOPP	13.3	193.2 > 133.1
Mephedrone	14.6	178.1 > 144.2
Mescaline	12.7	212.1 > 165.1
Metformin	2.5	130 > 60.1
Methadone	24.0	310.2 > 105.1
Methadone-d3	24.0	313.2 > 268.2
Methamphetamine	12.8	150.1 > 91.2
Methaqualone	22.8	251.2 > 91.1
Methedrone	13.9	194.1 > 146.1
Methiopropamine	10.6	156.1 > 97
Methocarbamol	16.8	242.1 > 118.1
Methoxetamine	17.2	248.2 > 121.1
3-Methoxytyramine	6.6	168 > 91
Methylethcathinone	20.0	192.1 > 144.2
Methylhexanamine	13.4	116.1 > 57.3
Methylone	12.7	208.1 > 132.1
Methylphenidate	16.5	234.1 > 56.2
5-Methyltryptamine	16.9	175.1 > 143
Metoclopramide	17.2	300.1 > 227.1
Midazolam	20.9	326.1 > 249.1

Analyte	R <sub>t</sub>	MRM Transitions
Mirtazapine	16.6	266.1 > 72.2
Mitragynine	22.6	399.3 > 174.1
Modafinil	21.1	296.1 > 129
6-Monoacetylmorphine	12.9	328.1 > 165.1
Mono-N-desethylamiodarone	30.8	618.2 > 547.2
Morphine	7.7	286.1 > 152.2
Morphine glucuronide	2.7	462.2 > 201.1
Morphine-d3	7.7	289.2 > 152.2
Naloxone	20.0	328.3 > 212.1
Naphyrone	23.2	282.2 > 141.1
Nefopam	19.5	254.9 > 166.1
Nifoxipam	20.9	316.05 > 298.1
Nimetazepam	23.6	296.1 > 250.2
Nitrazepam	22.8	282.1 > 236.1
Noralfentanil/sufentanil	19.4	277.1 > 245.1
Norbuprenorphine glucuronide	15.5	590.3 > 414.3
Norcyclizine	21.9	253.2 > 167.1
Nordiazepam	24.4	271.1 > 140.1
Nordothiepin	24.4	282.1 > 202.1
Norfentanyl	15.6	233.2 > 56.2
Norketamine	14.8	224.1 > 125.1
Normorphine	3.8	272.1 > 165.2
Nornefopam	19.7	240.9 > 166.1
Noroxycodone	13.0	302.1 > 284.1
Norpropoxyphene	23.0	308 > 44.2
Norsertaline	20.0	275.3 > 159
Nortriptyline	24.6	264.1 > 91.1
Olanzapine	13.4	313.1 > 84.1
Orphenadrine	23.4	270.1 > 181.1
Oxazepam	23.5	287.1 > 104.1
Oxybutynin	24.6	358.1 > 141.9
Oxycodone	12.9	316.1 > 241.1
Oxymorphone	20.0	302 > 227
Paracetamol	7.8	152.1 > 65.1
PCP	20.5	244.3 > 86.2
Pentazocine	19.5	286.3 > 175.2
Pentedrone	16.0	192.2 > 131.1
Phenazepam	24.5	350.9 > 206
Pheniramine	15.1	241.2 > 196.2
Phenytoin	20.0	253.1 > 77
Pholcodine	9.2	399.2 > 114.1
PMA	13.8	149.2 > 91.1
PMMA	14.6	180.2 > 121.1
Powder 20140730	18.7	248.3 > 84.2
Prazepam	27.0	325 > 140

Analyte	R <sub>t</sub>	MRM Transitions
Pregabalin	10.4	160.1 > 97.2
Procyclidine	22.4	288.3 > 42
Promethazine	20.0	285.1 > 86.2
Propofol	23.9	179 > 137
Propofol glucuronide	20.1	372.2 > 148.1
Propoxyphene	23.6	340.2 > 58.2
Propranolol	23.0	260.1 > 157.1
Quetiapine	21.7	384.1 > 221.1
Remifentanyl	18.4	377.3 > 113.1
Risperidone	20.4	411.1 > 190.8
Ritalinic acid	14.4	220.2 > 56.1
Sertraline	25.6	306.1 > 159
Sildenafil	23.6	475.4 > 58.1
Sildenafil N-oxide	23.9	491.4 > 312.3
Sufentanyl	22.9	387.3 > 140.2
Temazepam	24.2	301.1 > 177.1
Temazepam-d5	24.1	306.1 > 260.2

Analyte	R <sub>t</sub>	MRM Transitions
Tetrazepam	24.5	289.2 > 225.2
TFMPP	7.9	231.1 > 118.1
Theophylline	11.2	181.1 > 124.1
Tramadol	16.9	264.2 > 58.2
Trazodone	23.9	372.2 > 179.2
Trifluoperazine	28.8	408.2 > 113.2
Trihexyphenidyl	23.7	302.1 > 70.1
Varenicline	12.3	212.2 > 168.1
Venlafaxine	19.1	278.2 > 58.2
Verapamil	23.9	455.2 > 150.1
Vigabatrin	2.5	130.1 > 71.1
Warfarin	25.7	309.1 > 251.1
Zaleplon	21.5	306.1 > 236.2
Zolpidem	18.8	308.2 > 235.2
Zolpidem phenyl COOH	15.3	338 > 265.1
Zopiclone	16.5	389.1 > 217.1
Zopiclone N-oxide	17.6	405.2 > 217.1

## ORDERING TABLE

Product	Details	Size	Part Number
Avantor® ACE® Excel® 2 C18-PFP	UHPLC Column	100 x 2.1 mm	EXL-1010-1002U
Methanol	VWR HiPerSolv CHROMANORM® for LC-MS	2.5 L	83638.320
Water	VWR HiPerSolv CHROMANORM® for LC-MS	2.5 L	83645.320
Formic acid	VWR HiPerSolv CHROMANORM® for LC-MS	10 x 1 mL	85048.001
Ammonium acetate	VWR HiPerSolv CHROMANORM® for LC-MS	100 g	84885.180