



## Therapeutic Drug Monitoring in Serum/Plasma LC-MS/MS Analysis Kit

Jasem therapeutic drug monitoring (TDM) method introduces a procedure for detecting drugs of abuse such as benzodiazepines, antidepressants, atypical antipsychotics, over-the-counter cold medicines as well as routinely used prescription drugs by follow up patients, in serum samples by LC/MS-MS. Jasem-TDM method facilitate the confirmatory of drugs implementing straightforward sample preparation (just protein precipitation) protocol. The list of analytes could be enlarged on customer request. LC-MS/MS is currently the best technique available for the correct quantification of therapeutic drug monitoring (TDM). According to customer needs, Jasem clinical toxicology kit is suitable to extend the drug list with new compounds.

### Highlights of the Analysis Kit

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Simple and rapid sample preparation without SPE or evaporation



Quantitative determination of 116 drugs in a single injection



Simultaneous analysis of different drug groups-total run time is 12 min.



Long lifetime HPLC column



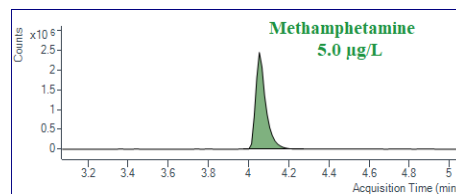
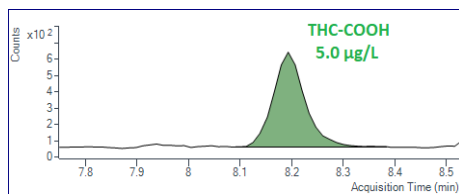
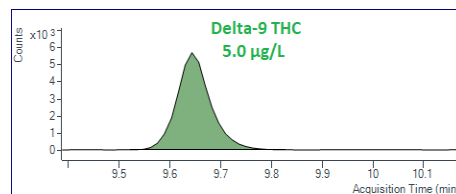
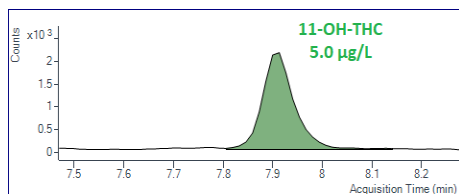
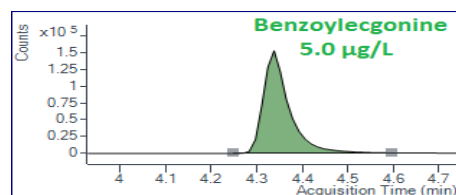
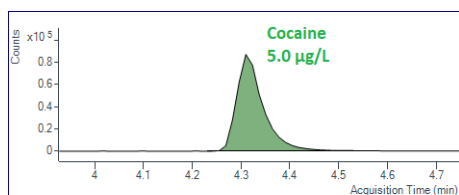
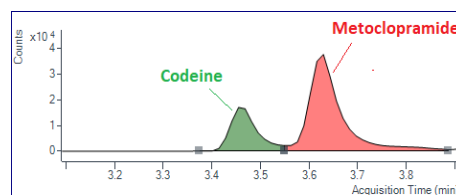
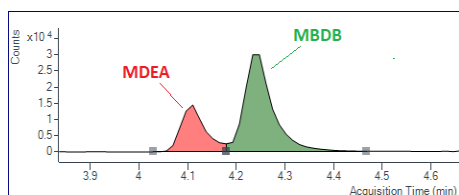
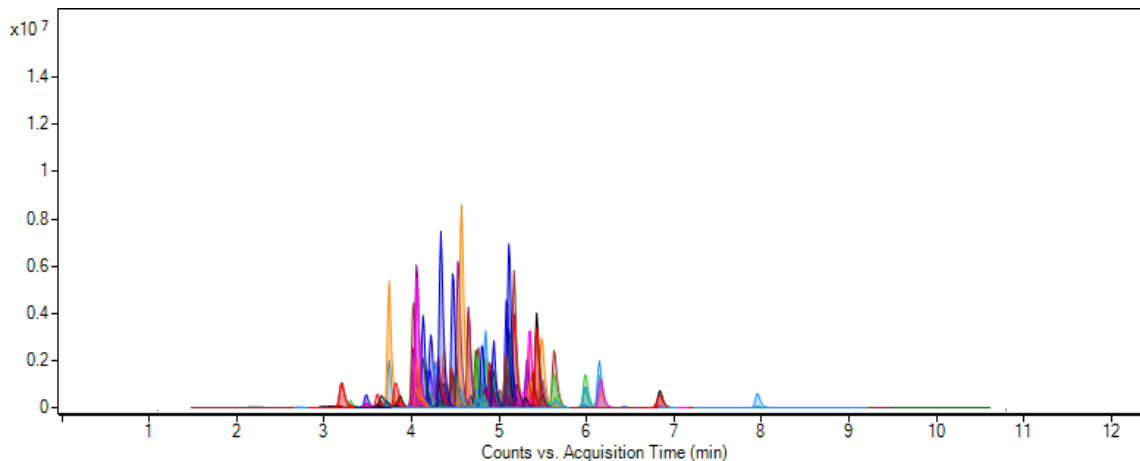
Method allows to extend the drug list

Parameters		
6-Acetylmorphine	Etodolac	Nifedipine
7-Aminoclonazepam	Famotidine	Nitrazepam
Alprazolam	Fentanyl	Norbuprenorphine
Amisulpride	Fluconazole	Nordiazepam
Amitriptyline	Flunitrazepam	Nortriptyline
Amlodipine	Fluoxetine	Olanzapine
Amphetamine	Flurazepam	Opi Pramol
Atenolol	Fluvoxamine	Ornidazole
Atropine	Gabapentin	Oxazepam
Benzoyllecgonine	Glibenclamide	Oxcarbazepine
Biperiden	Haloperidol	Oxycodone
Bromazepam	Hydroxyzine	Paliperidone
Buprenorphine	Imipramine	Pantoprazole
Carbamazepine	Ketamine	Paracetamol
Chlordiazepoxide	Lansoprazole	Paroxetine
Chlorpheniramine	Levetiracetam	Pentobarbital
Chlorpromazine	Lidocaine	Pentoxifylline
Citalopram	Loperamide	Pethidine
Clobazam	Lorazepam	Pheniramine
Clomipramine	MBDB	Phenobarbital
Clonazepam	MDA	Phenytoin
Clozapine	MDEA	Prilocaine
Cocaethylene	MDMA	Propafenone
Cocaine	Medazepam	Propranolol
Codeine	Memantine	Propyphenazone
Desipramine	Metformin	Pseudoephedrine + Ephedrine
Desmethyldomipramine	Methadone	Quetiapine
Desmethyloanzapine	Methamphetamine	Ranitidine
Dextromethorphan	Methylecgonine	Risperidone
Diazepam	Metoclopramide	Sertraline
Diclofenac	Metoprolol	THC delta9-Tetrahydrocannabinol
Digoxin	Metronidazole	THC-COOH
Dihydrocodeine	Mianserin	THC-OH 11-OH-tetrahydrocannabinol
Diltiazem	Midazolam	Thiopental
Diphenhydramine	Mirtazepine	Thioridazine
Doxepin	Moclobemide	Tramadol
Doxylamine	Morphine	Trimipramine
EDDP	Naproxen	Venlafaxine
Ethylmorphine	N-desmethyloanzapine	
Sample Type		
Serum/Plasma		

### Sample Preparation

1	Pipette 100 µl serum or plasma sample into a microcentrifuge tube
2	Add 900 µl of Reagent-1 and vortex for 15 sec. Then, centrifuge at 10000-12000 rpm for 5 min.
3	Decant the clear supernatant into HPLC vial

### Example Chromatogram



Example ion chromatogram for TDM analytes

## Method Performance

All results were obtained using Agilent 6465 TQ (Ultivo) instrument

	Analytes	LOQ (µg/L)	Linearity (µg/L)	Recovery (%)	Repeatability (%CV)
1	6-Acetylmorphine	0.33	0.33 – 100.0	99	5.56
2	7-Aminoclonazepam	0.34	0.34 – 100.0	109	5.74
3	Alprazolam	0.29	0.29 – 100.0	104	5.48
4	Amisulpride	0.30	0.3 – 100.0	96	5.26
5	Amitriptyline	0.44	0.44 – 100.0	100	5.31
6	Amlodipine	0.70	0.7 – 100.0	99	6.76
7	Amphetamine	0.36	0.36 – 100.0	107	7.79
8	Atenolol	0.28	0.28 – 100.0	98	4.88
9	Atropine	0.29	0.29 – 100.0	101	5.65
10	Benzoylcegonine	0.36	0.36 – 100.0	103	5.15
11	Biperiden	0.33	0.33 – 100.0	104	5.83
12	Bromazepam	0.46	0.46 – 100.0	104	5.85
13	Buprenorphine	4.02	4.02 – 100.0	109	6.46
14	Carbamazepine	0.40	0.4 – 100.0	102	5.45
15	Chlordiazepoxide	0.50	0.5 – 100.0	102	5.57
16	Chlorpheniramine	0.34	0.34 – 100.0	101	5.47
17	Chlorpromazine	0.32	0.32 – 100.0	103	5.60
18	Citalopram + Escitalopram	0.40	0.4 – 100.0	105	5.69
19	Clobazam (Urbadan)	0.35	0.35 – 100.0	103	5.80
20	Clomipramine	0.44	0.44 – 100.0	102	5.92
21	Clonazepam	0.79	0.79 – 100.0	106	6.02
22	Clozapine	0.32	0.32 – 100.0	105	5.76
23	Cocaethylene	0.38	0.38 – 100.0	97	5.25
24	Cocaine	0.63	0.63 – 100.0	104	5.63
25	Codeine	0.53	0.53 – 100.0	99	5.16
26	Desipramine	0.64	0.64 – 100.0	100	6.88
27	Desmethylclomipramine	0.32	0.32 – 100.0	106	5.86
28	Desmethyloanzapine	0.06	0.06 – 100.0	112	1.67
29	Dextromethorphan	0.29	0.29 – 100.0	104	5.50
30	Diazepam	0.31	0.31 – 100.0	103	5.60
31	Diclofenac	0.32	0.32 – 100.0	94	5.46
32	Digoxin	6.40	6.4 – 100.0	91	4.58
33	Dihydrocodeine	0.28	0.28 – 100.0	98	5.31
34	Diltiazem	0.44	0.44 – 100.0	101	5.64
35	Diphenhydramine	0.36	0.36 – 100.0	102	5.56
36	Doxepin	0.48	0.48 – 100.0	105	5.92
37	Doxylamine	0.21	0.21 – 100.0	98	6.23

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Analytes		LOQ (µg/L)	Linearity (µg/L)	Recovery (%)	Repeatability (%CV)
38	EDDP	0.56	0.56 – 100.0	99	5.83
39	Ephedrine + Pseudoephedrine	0.43	0.43 – 100.0	96	6.42
40	Ethylmorphine	0.40	0.4 – 100.0	96	6.02
41	Etodolac	0.18	0.18 – 100.0	93	4.93
42	Famotidine	0.51	0.51 – 100.0	103	5.47
43	Fentanyl	0.32	0.32 – 100.0	100	5.48
44	Fluconazole	0.55	0.55 – 100.0	100	6.64
45	Flunitrazepam	0.48	0.48 – 100.0	101	5.47
46	Fluoxetine	0.30	0.3 – 100.0	100	6.25
47	Flurazepam	0.50	0.5 – 100.0	108	6.22
48	Fluvoxamine	0.37	0.37 – 100.0	101	5.61
49	Gabapentin	0.52	0.52 – 100.0	103	6.32
50	Glibenclamide	0.30	0.3 – 100.0	103	5.25
51	Haloperidol	0.29	0.29 – 100.0	105	5.36
52	Hydroxyzine	0.41	0.41 – 100.0	101	5.72
53	Imipramine	0.50	0.5 – 100.0	100	5.72
54	Ketamine	0.44	0.44 – 100.0	99	5.78
55	Lansoprazole	0.40	0.4 – 100.0	52	8.60
56	Levetiracetam	0.39	0.39 – 100.0	99	5.33
57	Lidocaine (Diocaine)	0.30	0.3 – 100.0	99	5.61
58	Loperamide	0.38	0.38 – 100.0	102	5.87
59	Lorazepam	1.30	1.3 – 100.0	104	6.33
60	MBDB	0.34	0.34 – 100.0	104	6.32
61	MDA	0.32	0.32 – 100.0	102	5.54
62	MDEA	0.28	0.28 – 100.0	98	5.26
63	MDMA	0.29	0.29 – 100.0	100	5.52
64	Medazepam	0.50	0.5 – 100.0	103	6.09
65	Memantine	0.32	0.32 – 100.0	102	5.54
66	Metformin	0.61	0.61 – 100.0	96	2.87
67	Methadone	0.33	0.33 – 100.0	102	5.74
68	Methamphetamine	0.39	0.39 – 100.0	102	5.53
69	Methylecgonine	0.34	0.34 – 100.0	98	2.79
70	Metoclopramide	0.31	0.31 – 100.0	98	5.24
71	Metoprolol	0.37	0.37 – 100.0	100	5.30
72	Metronidazole	0.43	0.43 – 100.0	102	5.07
73	Mianserin	0.29	0.29 – 100.0	102	5.64
74	Midazolam	0.48	0.48 – 100.0	102	5.83

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Analytes		LOQ (µg/L)	Linearity (µg/L)	Recovery (%)	Repeatability (%CV)
75	Mirtazepine	0.34	0.34 – 100.0	103	5.80
76	Moclobemide	0.33	0.33 – 100.0	104	5.75
77	Morphine	0.24	0.24 – 100.0	99	5.16
78	Naproxen	0.67	0.67 – 100.0	99	5.69
79	N-desmethylozapine	0.29	0.29 – 100.0	100	6.13
80	Nifedipine	0.65	0.65 – 100.0	94	4.92
81	Nitrazepam	0.32	0.32 – 100.0	104	5.64
82	Norbuprenorphine	0.40	0.4 – 100.0	102	5.39
83	Nordiazepam	0.24	0.24 – 100.0	102	5.08
84	Nortriptyline	0.34	0.34 – 100.0	100	5.34
85	Olanzapine	0.27	0.27 – 100.0	93	5.36
86	Opi Pramol	0.33	0.33 – 100.0	102	5.66
87	Ornidazole	0.49	0.49 – 100.0	101	5.96
88	Oxazepam	1.10	1.1 – 100.0	108	4.77
89	Oxcarbazepine	0.50	0.5 – 100.0	94	4.78
90	Oxycodone	0.50	0.5 – 100.0	99	4.94
91	Paliperidone	0.29	0.29 – 100.0	102	5.64
92	Paracetamol	0.90	0.9 – 100.0	99	5.85
93	Paroxetine	0.77	0.77 – 100.0	105	6.14
94	Pentoxifylline	0.52	0.52 – 100.0	103	5.83
95	Pethidine	0.28	0.28 – 100.0	103	5.77
96	Pheniramine	0.48	0.48 – 100.0	100	5.87
97	Phenytoin	5.60	5.6 – 100.0	113	5.21
98	Prilocaine	1.26	1.26 – 100.0	116	6.03
99	Propafenone	0.48	0.48 – 100.0	105	5.58
100	Propranolol	0.51	0.51 – 100.0	100	5.45
101	Propyphenazone	0.36	0.36 – 100.0	102	5.39
102	Quetiapine	0.31	0.31 – 100.0	101	5.97
103	Ranitidine	0.28	0.28 – 100.0	97	3.85
104	Risperidone	0.28	0.28 – 100.0	98	5.17
105	Sertraline	0.37	0.37 – 100.0	103	5.33
106	Delta-9- THC	0.32	0.32 – 100.0	106	5.43
107	THC-COOH	1.99	1.99 – 100.0	96	5.49
108	THC-OH	1.07	1.07 – 100.0	95	5.21
109	Thiopental	1.54	1.54 – 100.0	94	7.25
110	Thioridazine	0.30	0.3 – 100.0	100	5.47
111	Tramadol	0.32	0.32 – 100.0	105	5.60

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Analytes		LOQ (µg/L)	Linearity (µg/L)	Recovery (%)	Repeatability (%CV)
112	Trimipramine	0.29	0.29 – 100.0	102	5.66
113	Venlafaxine	0.36	0.36 – 100.0	102	5.93
114	Pentobarbital	80.96	80.96 – 100.0	89	15.84
115	Phenobarbital	9.42	9.42 – 100.0	80	21.80
116	Pantoprazole	2.16	2.16 – 100.0	90	10.35



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