

Supplemental information

Effects of the LC mobile phase in Vacuum Differential Mobility Spectrometry-Mass Spectrometry for the Selective Analysis of Antidepressant Drugs in Human Plasma

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Figure S1: Chemical structures of isobaric and structural related analytes. (1) amitriptyline (2) maprotiline (3) venlafaxine (4) nortriptyline (5) imipramine (6) desipramine.

Figure S2: Short LC-DMS-MS configuration.

Figure S3: MS/MS spectra of isobaric and related structural antidepressants drugs.

Figure S4: CV plots for amitriptyline, maprotiline and venlafaxine.

Figure S5: Calibration plots of plasma spiked with antidepressants drugs (25 to 2500 ng/mL).

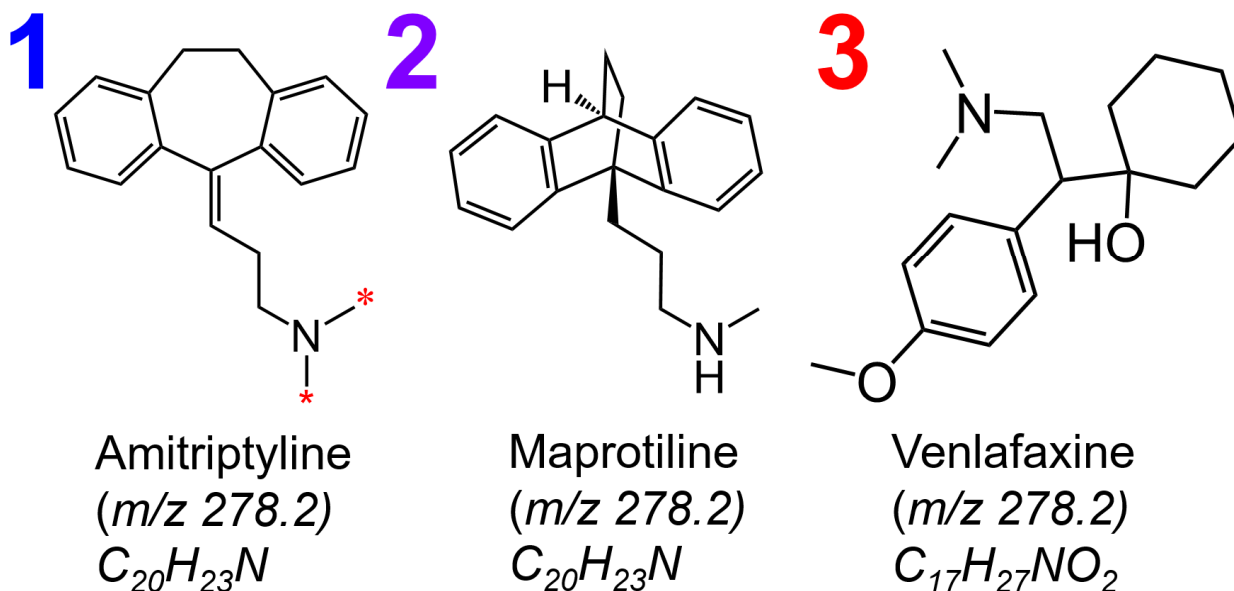
Figure S6: Inter-assay accuracy at LLOQ level (25 ng/ml) of spiked antidepressant drugs in plasma samples

Figure S7: Representative zoomed chromatograms of human plasma for LC-MRM/MS method.

Table S1: MS conditions and RT for LC-DMS-SIM/MS and LC-MRM/MS.

Figure S1. Chemical structures of isobaric and structural related analytes. (1) amitriptyline (2) maprotiline (3) venlafaxine (4) nortriptyline (5) imipramine (6) desipramine. Red stars indicate atoms isotopically labeled for internal standards (D_3)

Isobaric compounds



Structural related compounds

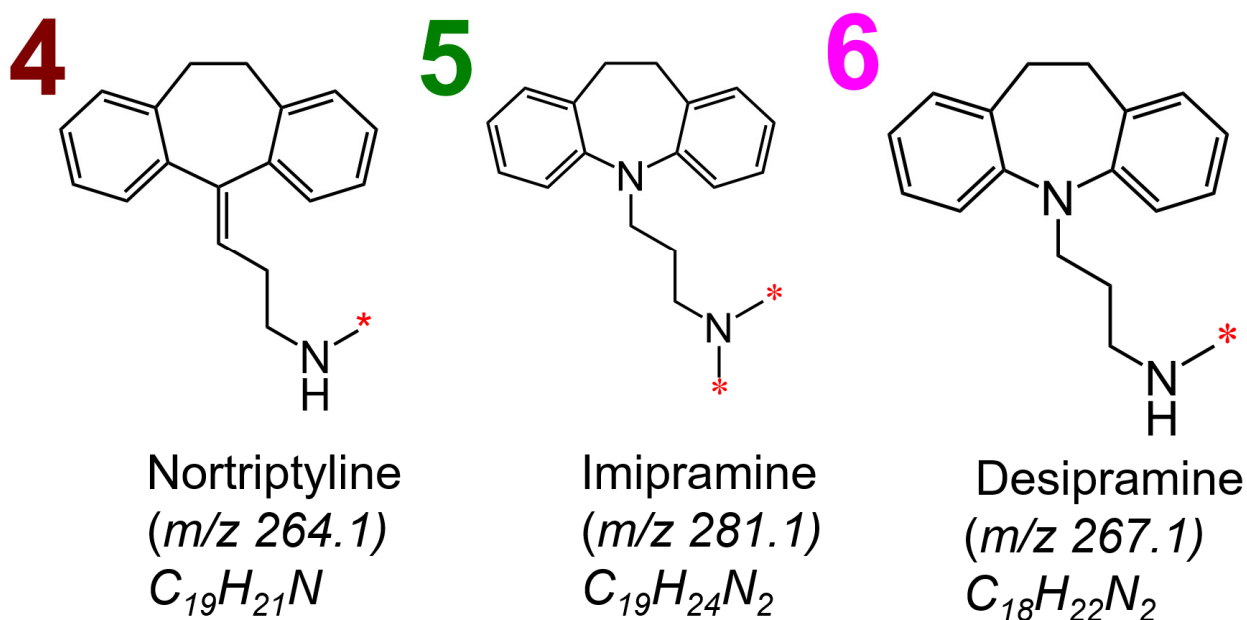
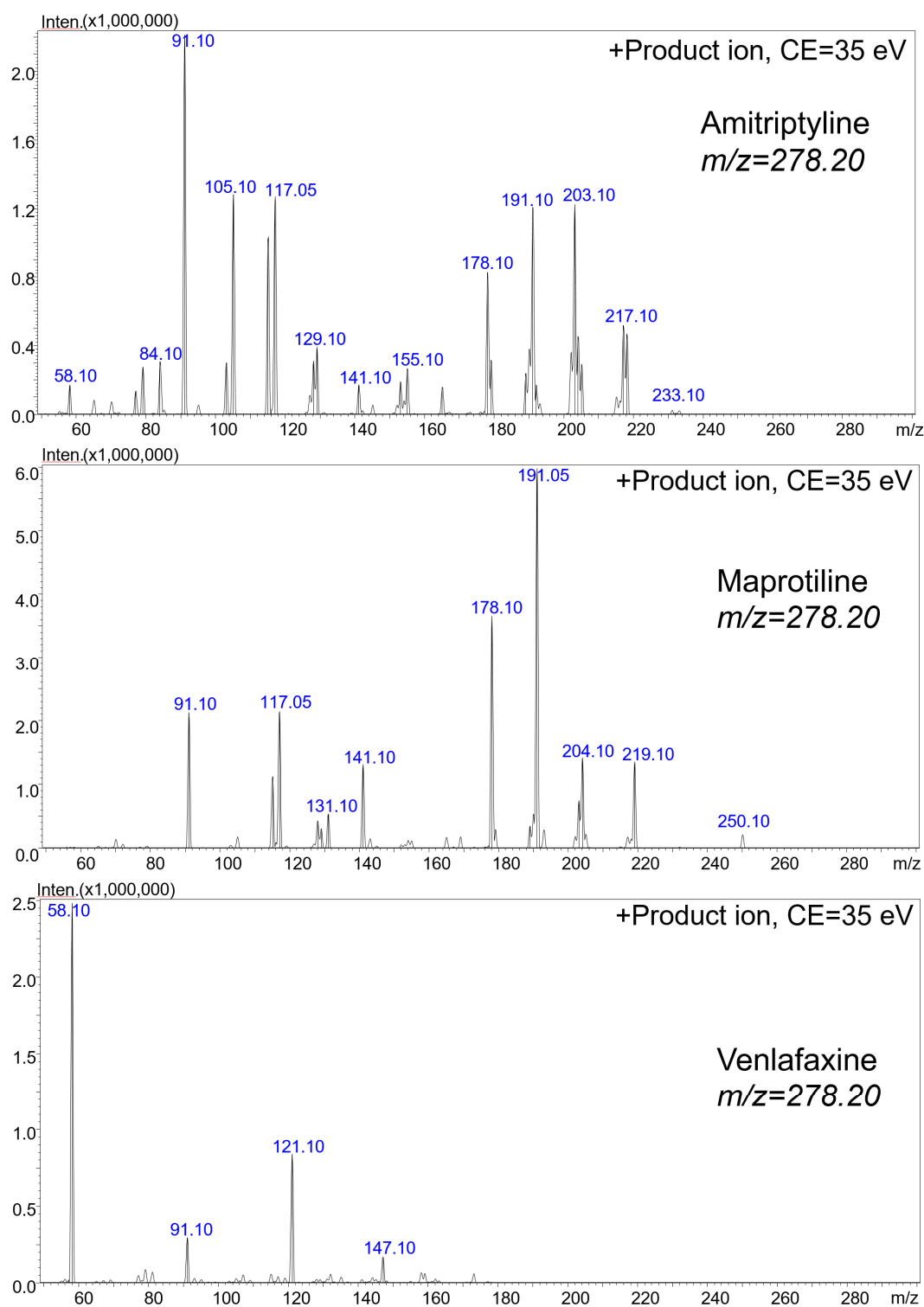


Figure S2. Product ion spectra of antidepressants drugs used in the study and acquired on LCMS-8050 (Shimadzu Corporation, Japan) at a collision energy of 35 eV.



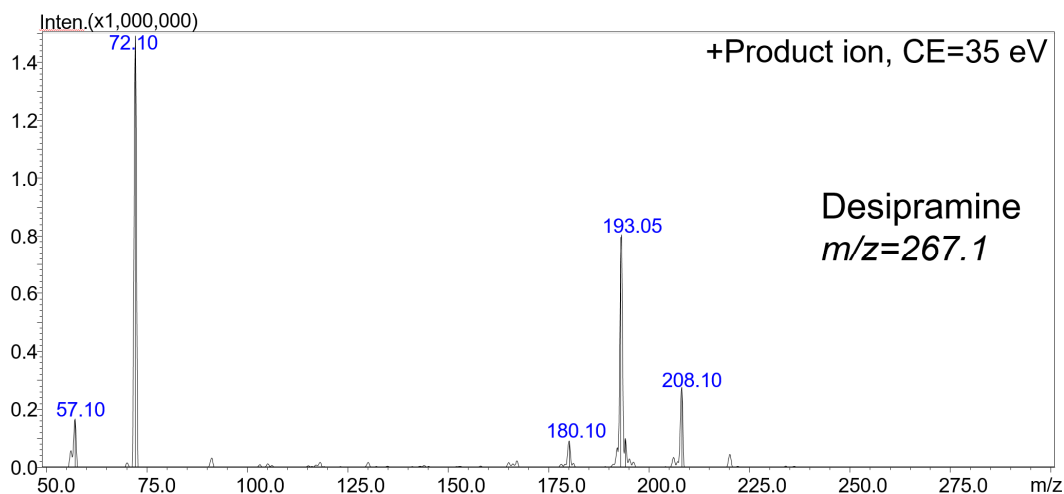
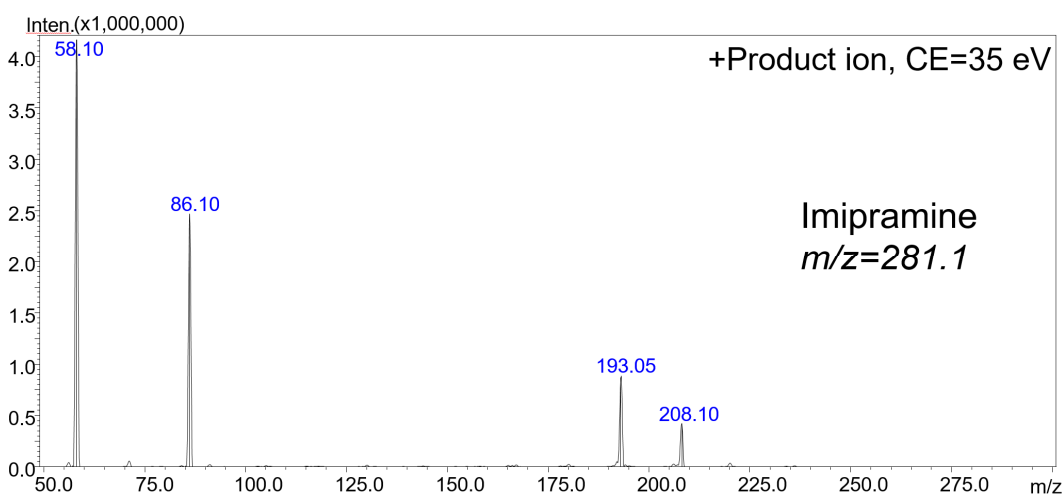
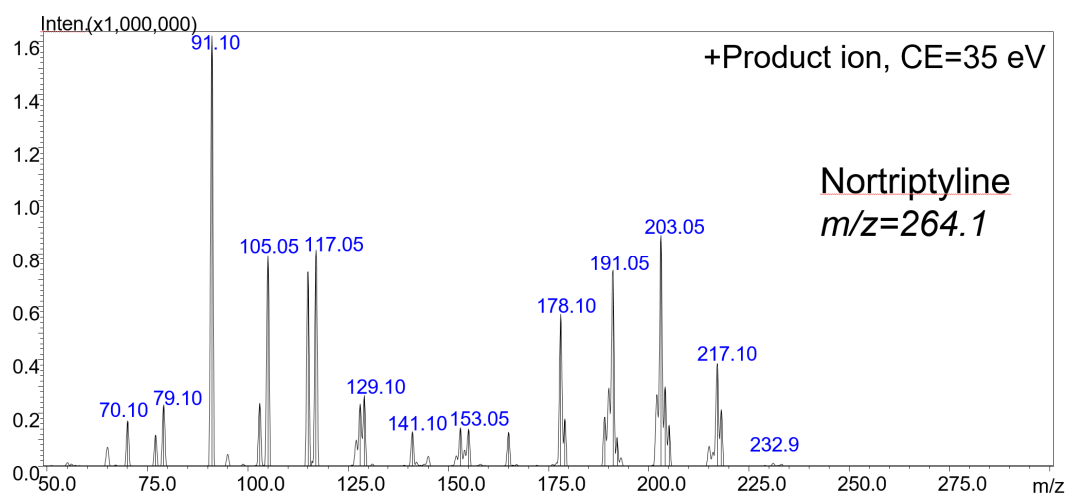


Figure S3: Trap-elute LC-DMS-MS configuration. A short column Luna Omega C18 (20 x 0.5 mm, 5 μm 100A°) was used to analyzed the samples in 2 steps: front-flush injection (A) and back-flush elution of analytes (B) acquired in SIM mode of antidepressants drugs.

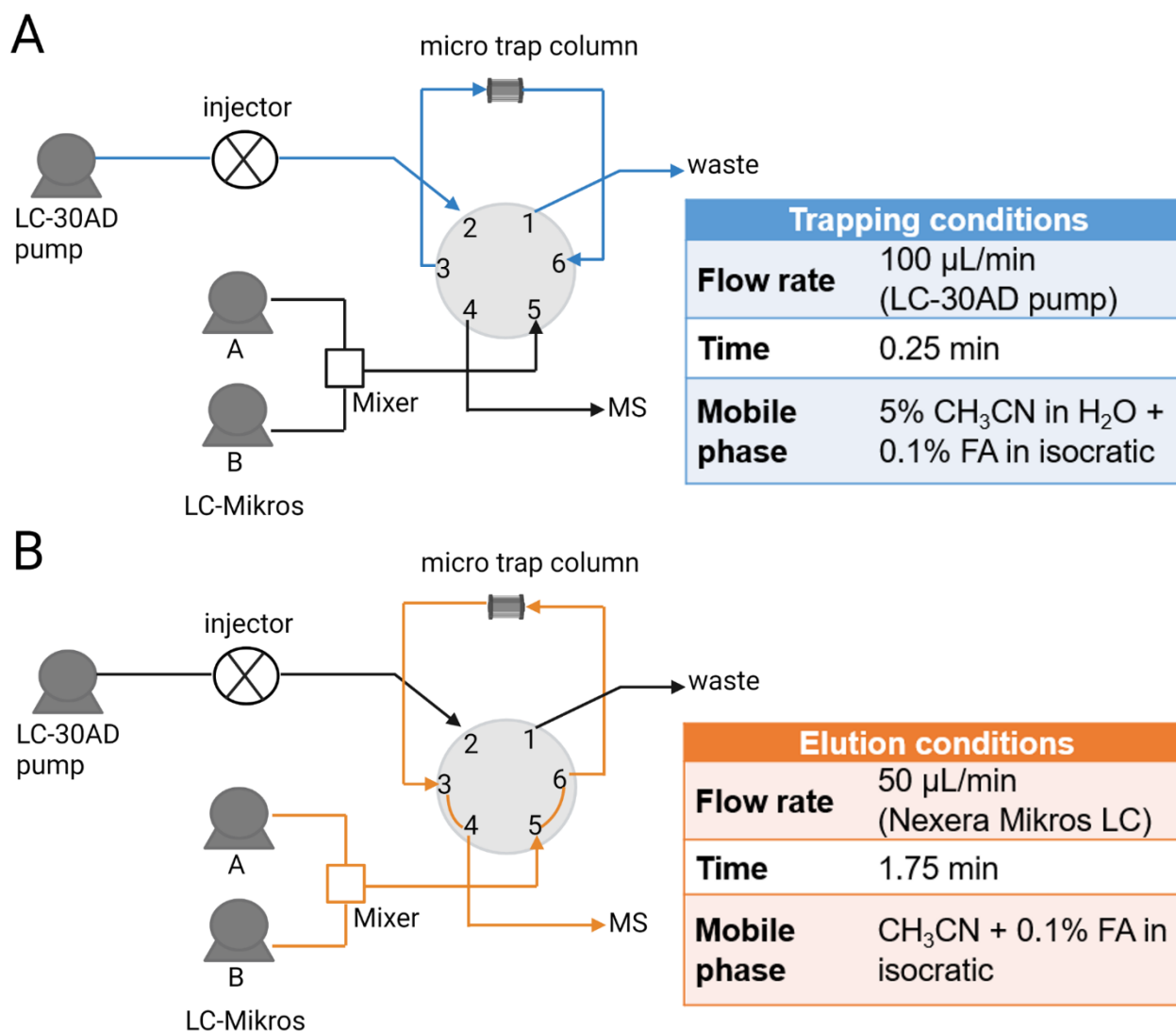


Figure S4: CV plots for amitriptyline, maprotiline and venlafaxine with A) 100 % acetonitrile 0.1 % FA, B) 100 % ethanol, 0.1 % FA. The analytes were infused at 500 ng/mL at a flow rate of 50 μ L/min. The SV was of 800 V and CV steps of 0.2 V.

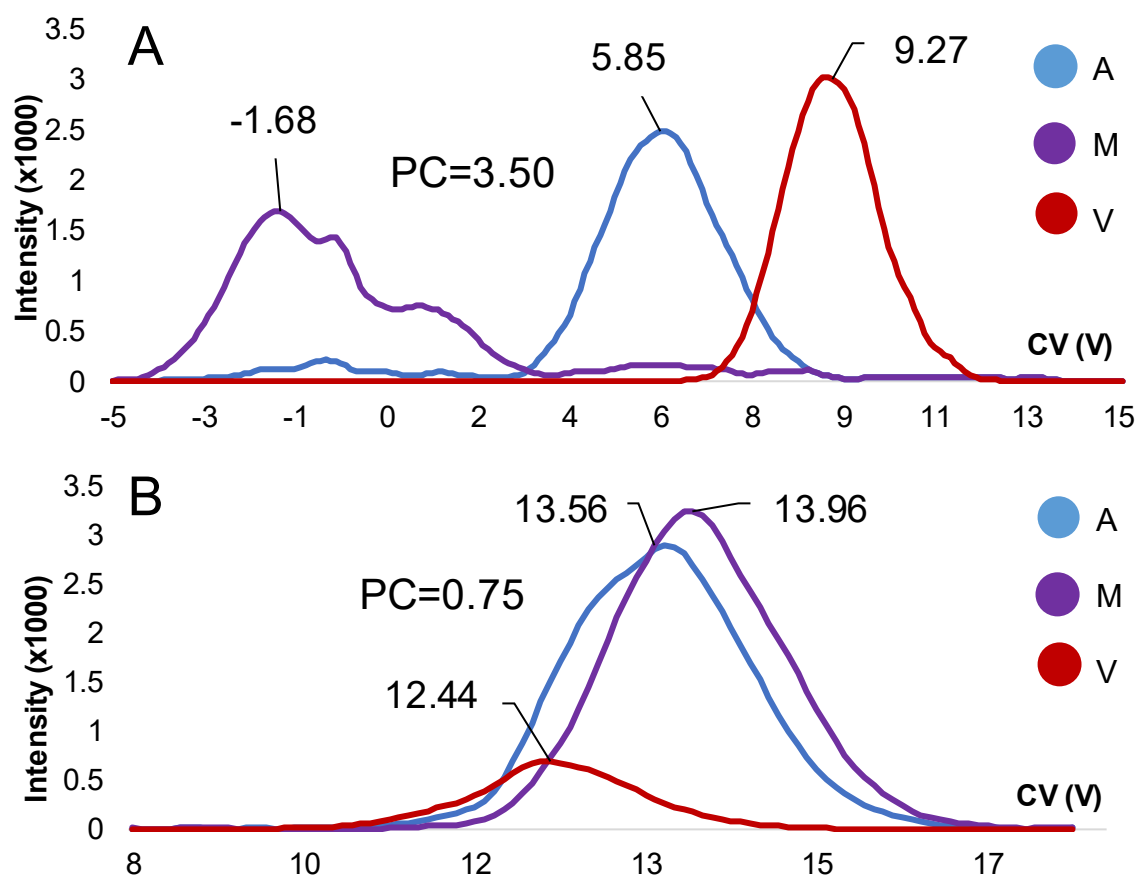
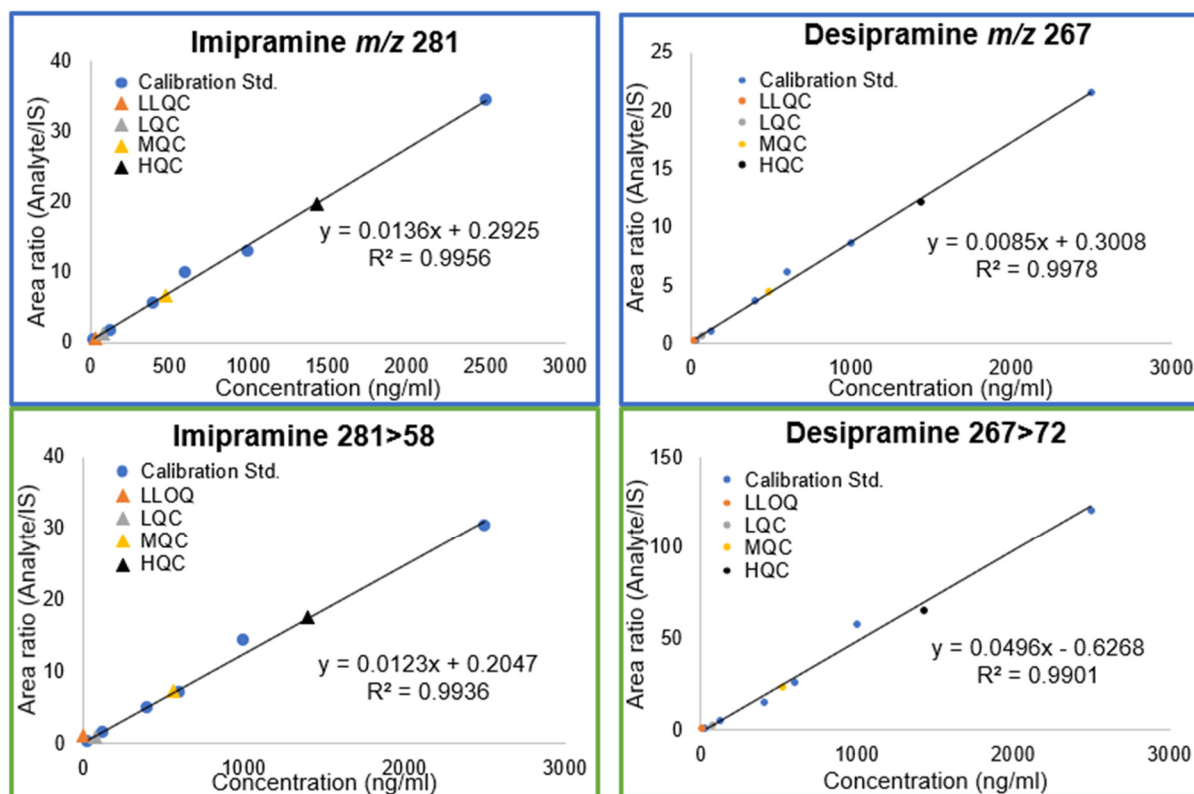


Figure S5. Calibration plots of plasma spiked with antidepressants drugs (25 to 2500 ng/mL). Triangles represents the accuracy QC levels (LLOQ, LQC, MQC, HQC). Samples were analyzed by the short LC-DMS-MS (acquired in SIM mode) highlighted in blue and LC-MS/MS (acquired in MRM mode) in green trace. Imipramine-D₃ was used as internal standard to correct matrix effect in short LC-DMS-MS in contrast to LC-MS was used the corresponding analog deuterium labelled compound. Amitriptyline-D₃ (for isobaric compounds), nortriptyline-D₃, desipramine-D₃ and imipramine-D₃.



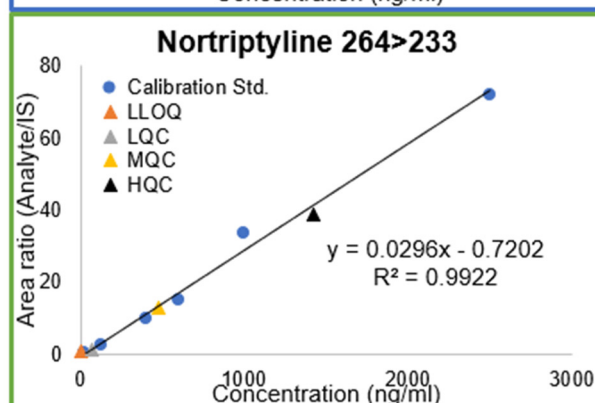
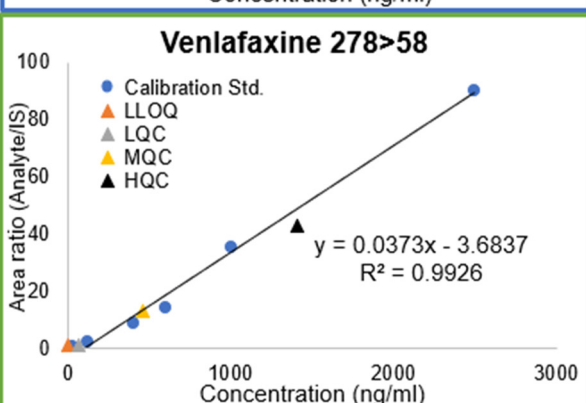
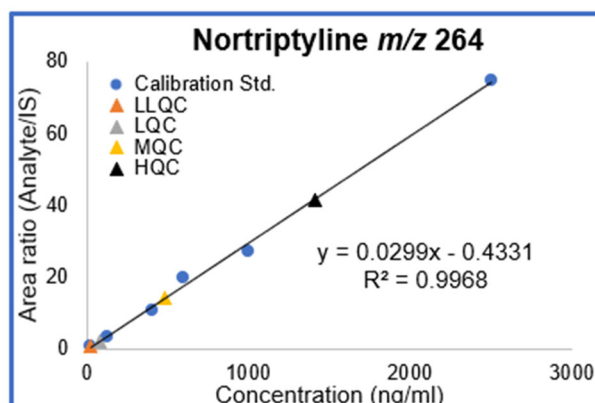
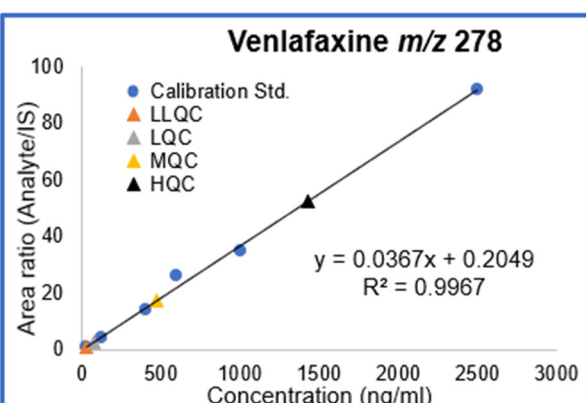
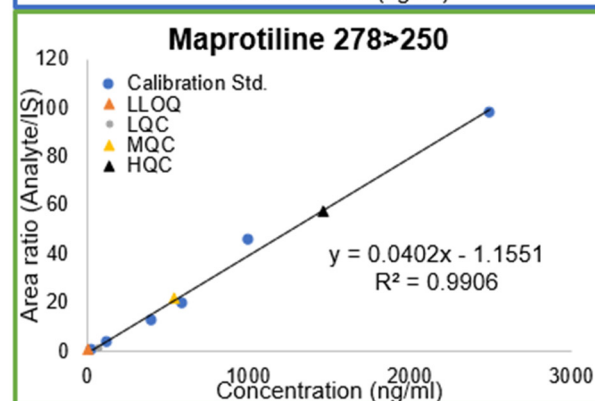
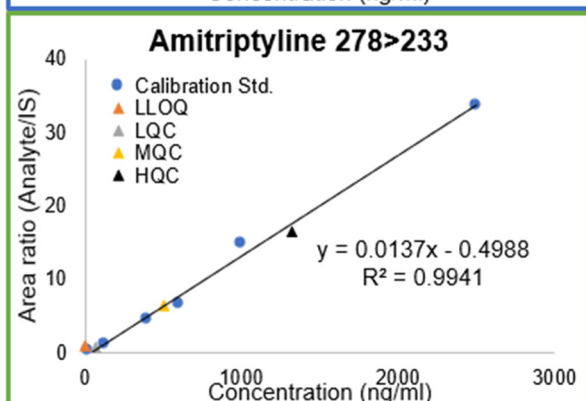
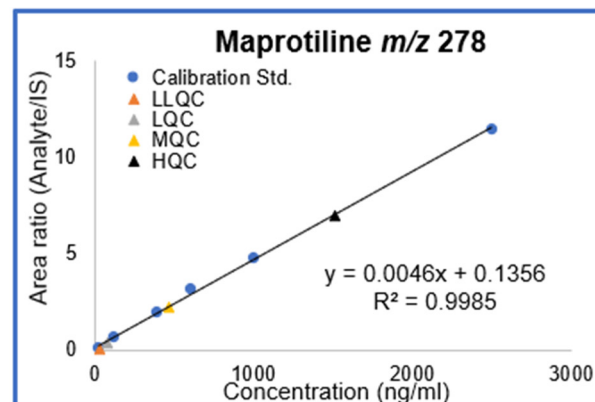
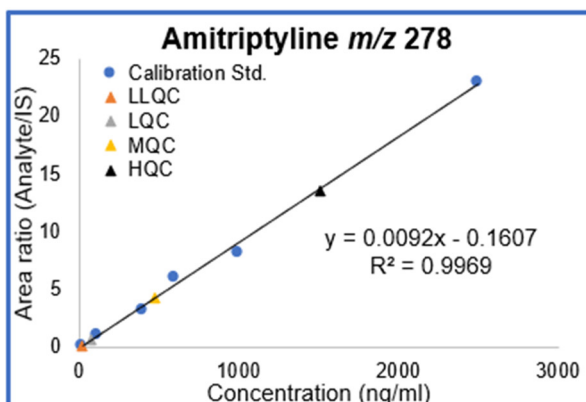


Figure S6: Inter-assay accuracy at LLOQ level (25 ng/ml) of spiked antidepressant drugs in plasma samples acquired by LC-MRM/MS and LC-DMS-SIM/MS methods.

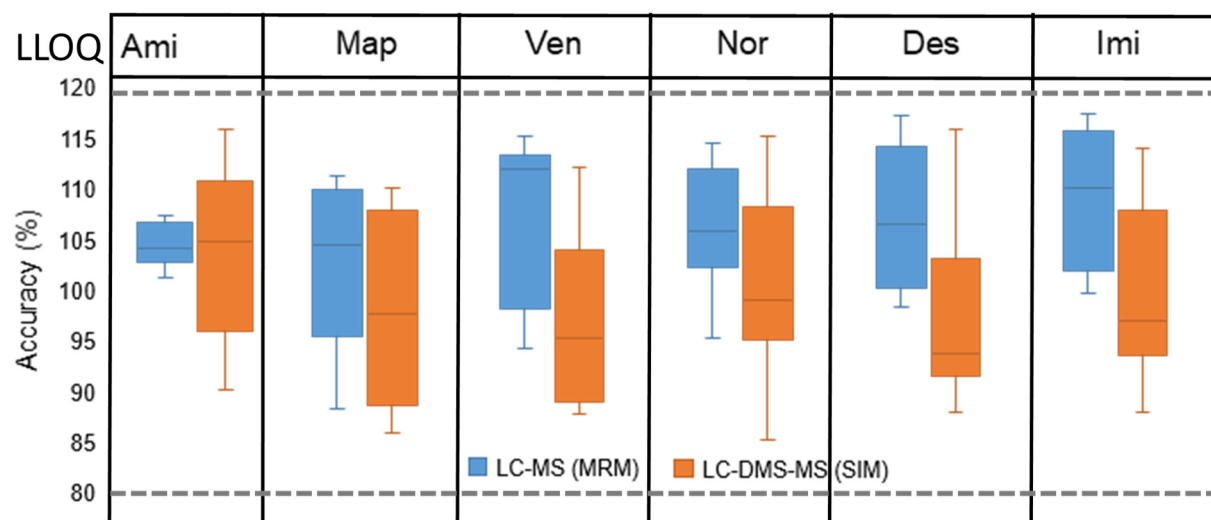


Figure S7: Representative extracted ion chromatograms LC-MRM/MS of human plasma with 400 ng/mL antidepressants drugs (IS 150 ng/mL)

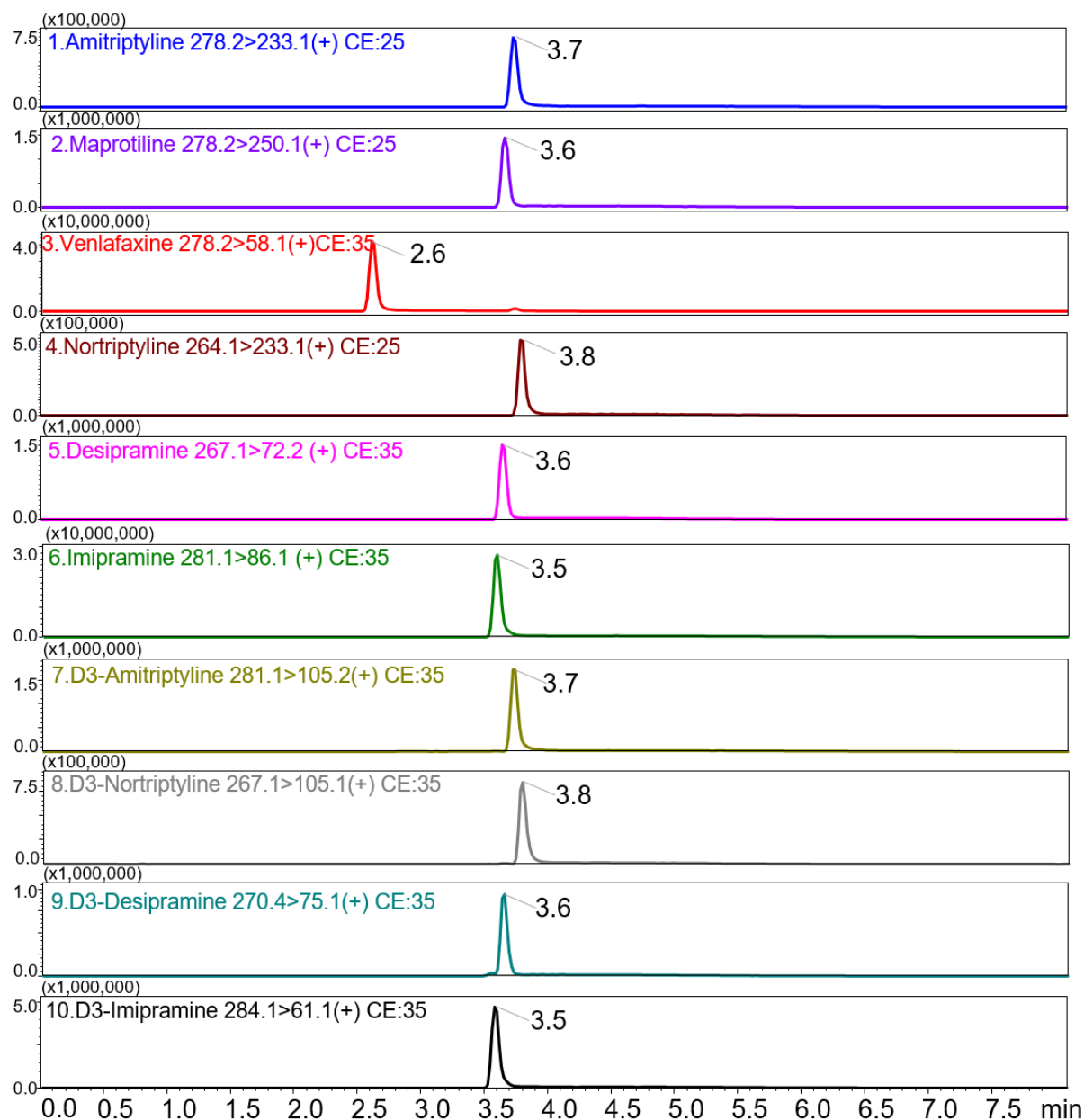


Table S1: MS conditions and RT for LC-DMS-SIM/MS and LC-MRM/MS methods. N/A not applied,

IS : Internal Standard

Antidepressants	LC-MRM/MS					LC-DMS-SIM/MS			
	Q1 (m/z)	Q3 (m/z)	CE (V)	RT (min)	IS	RT (min)	IS	CV (V)	DV (V)
Amitriptyline (A)	278.2	233.1	25	3.7	A-D3	0.7	I-D3	6.8	760
		105.2	35						
Maprotiline (M)	278.2	250.1	29	3.6	A-D3	0.7	I-D3	-1.1	760
		117.1	35						
Venlafaxine (V)	278.2	58.1	43	2.6	A-D3	0.7	I-D3	10.4	760
		121.1	25						
Nortriptyline (N)	264.1	233.1	21	3.8	N-D3	0.7	I-D3	-4.9	760
		105.1	35						
Desipramine (D)	267.1	72.2	29	3.6	D-D3	0.7	I-D3	-1.9	760
		193.1	35						
Imipramine (I)	281.1	86.1	25	3.5	I-D3	0.7	I-D3	10.4	760
		58.1	35						
D ₃ -Amitriptyline (A-D3)	281.1	233.1	25	3.7	N.A.	N.A.	N.A.	N.A.	N.A.
		105.2	35						
D ₃ -Nortriptyline (N-D3)	267.2	233.1	21	3.8	N.A.	N.A.	N.A.	N.A.	N.A.
		105.1	35						
D ₃ -Desipramine (D-D3)	270.2	75.1	29	3.6	N.A.	N.A.	N.A.	N.A.	N.A.
		193.1	25						
D ₃ -Imipramine (I-D3)	284.1	61.1	25	3.5	N.A.	0.7	-	10.6	760
		89.1	35						