Application Note

ACQUITY™ UPLC™ I-Class/Xevo™ TQD IVD System: Analytical Performance for Antidepressant Drugs

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Este é um Resumo de aplicações e, por isso, não inclui uma seção de experimento detalhada.

For *in vitro* diagnostic use. Not available in all countries.

Abstract

The Waters ACQUITY UPLC I-Class/Xevo TQD IVD System enables the quantification of organic compounds in human biological liquid matrices.

This document describes a test of the analytical performance of the ACQUITY UPLC I-Class/Xevo TQD IVD System for the analysis of citalopram, desmethylfluoxetine, duloxetine, fluoxetine, fluvoxamine, O-desmethylvenlafaxine, mirtazapine, sertraline, trazodone, and venlafaxine in plasma.

Experimental

The ACQUITY UPLC I-Class/Xevo TQD IVD System was controlled by MassLynx™ Software (v4.2) and the data processed using the TargetLynx™ XS Application Manager. Calibrators and Quality Controls were prepared by spiking commercially available reference material in plasma and the samples were processed using the following conditions:

Sample Preparation Conditions

A 50 µL sample was processed with acetonitrile and centrifuged, then subsequently diluted with water prior to analysis.

LC Conditions

Column:	XSelect™ Premier HSS T3, 2.5 µm, 2.1 mm x 100 mm
Mobile phase A:	2 mM ammonium acetate in water
Mobile phase B:	2 mM ammonium acetate in methanol
Flow rate:	0.4 mL/min / 0.6 mL/min
Gradient:	40% A initial, hold until 1.70 minutes, then ramp gradient 6 until 20% A at 4.00 minutes, at 4.01 minutes switch to 100% B at a flow rate of 0.6 mL/min until 4.50 minutes, finally return to 40% A

at 0.4 mL/min from 4.50 until 5.0 minutes.

MS Conditions

Resolution:	MS1 (0.75 FWHM), MS2 (0.75FWHM)
Acquisition mode:	MRM
Polarity:	ESI+

Results and Discussion

Chromatographic selectivity of a range of antidepressants using the ACQUITY UPLC I-Class/Xevo TQD IVD System is illustrated in Figure 1. Performance characteristics of the antidepressant drugs are shown in Table 1.

Compound	Calibration range* (ng/mL)	LLOQ (ng/mL)	Linear range ng/mL	Total precision	Repeatability
Citalopram	10–1000	7.5	7.7–1300	≤7.2%	≤2.6%
Desmethylfluoxetine	10–1000	7.5	7.7–1300	≤7.6%	≤3.2%
Duloxetine	10–1000	7.5	7.7–1300	≤6.7%	≤3.4%
Fluoxetine	10–1000	7.5	7.7–1300	≤6.5%	≤2.3%
Fluvoxamine	10–1000	7.5	7.7–1300	≤7.3%	≤2.6%
O-Desmethylvenlafaxine	10–1000	5	7.7–1300	≤5.9%	≤2.4%
Mirtazapine	5–500	5	3.83–650	≤10.0%	≤5.5%
Sertraline	10–1000	5	7.7–1300	≤9.1%	≤3.3%
Trazodone	30–3000	15	23–3900	≤5.8%	≤2.4%
Venlafaxine	10–1000	7.5	7.7–1300	≤6.7%	≤2.3%

*Table 1. Performance characteristics of the analytes evaluated. *Calibration Range was defined by linear fit where r^2 >0.995 for O-Desmethylvenlafaxine and duloxetine; for all other analytes a quadratic fit was used. LLOQ defined by S/N (PtP) >10 with %RSD ≤20% and ≤15% bias (with the exception of fluoxetine, for which bias was 17.6%). %RSD at LLOQ determined through analytical sensitivity experiments performed over five occasions (n=50). Total precision and repeatability of QCs performed over five occasions in plasma (n=25).*

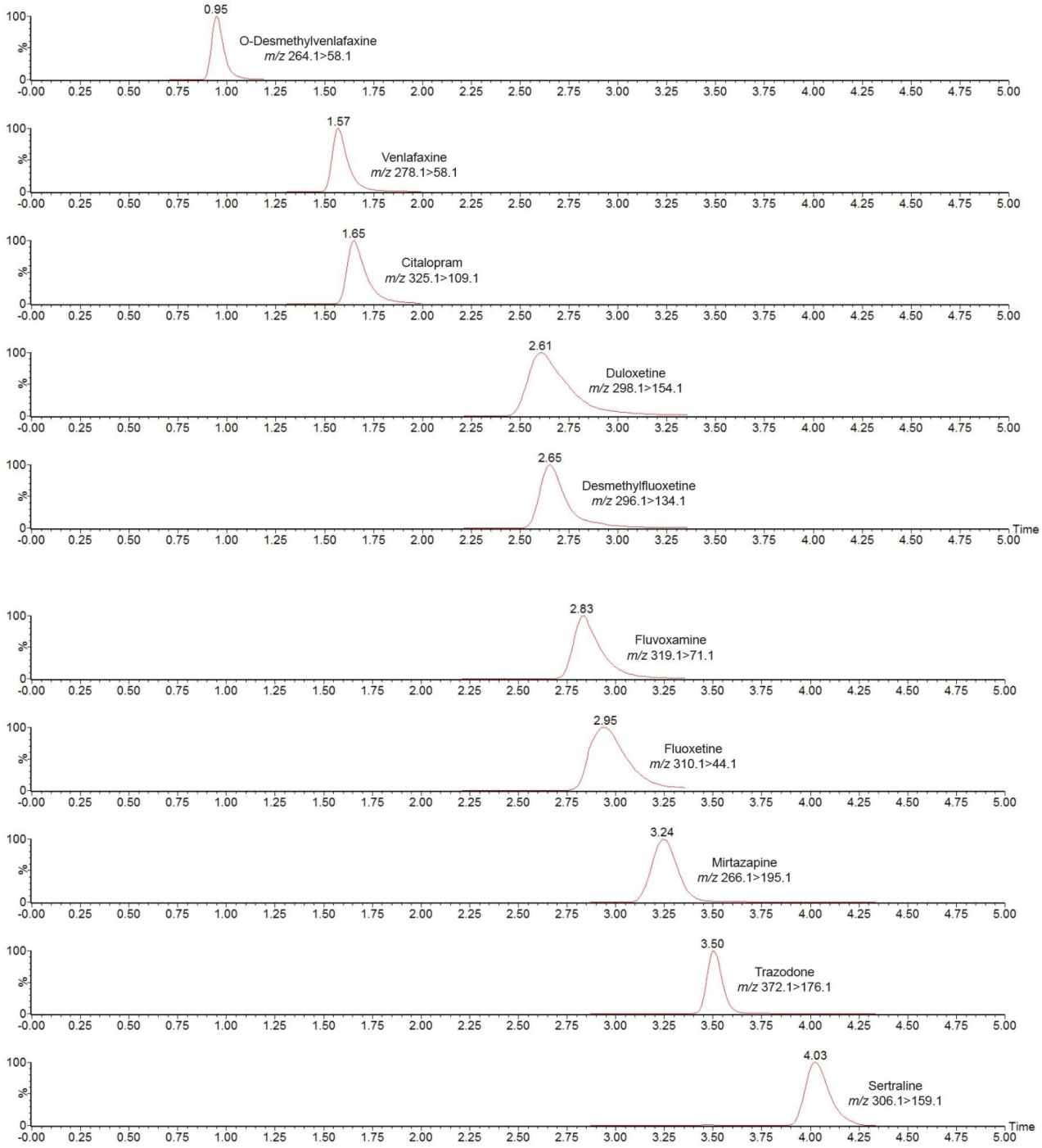

Figure 1. Chromatographic selectivity of a range of antidepressant drugs using the ACQUITY UPLC I-Class/ Xevo TQD IVD System.

Conclusion

The Waters ACQUITY UPLC I-Class/Xevo TQD IVD System has demonstrated the capability to analyze a panel of antidepressant drugs in plasma.

Disclaimer

The analytical performance data presented here is for illustrative purposes only. Waters does not recommend or suggest analysis of the analytes described herein. These data are intended solely to demonstrate the performance capabilities of the system for analytes representative of those commonly analyzed using liquid chromatography and tandem mass spectrometry. Performance in an individual laboratory may differ due to a number of factors, including laboratory methods, materials used, intra-operator technique, and system conditions. This document does not constitute a warranty of merchantability or fitness for any particular purpose, express or implied, including for the testing of the analytes in this analysis.

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MassLynx MS Software <https://www.waters.com/513662>

TargetLynx <https://www.waters.com/513791>

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