

SIMULTANEOUS SCREENING OF OVER THE COUNTER AND COMMONLY USED PRESCRIPTION DRUGS FROM A SINGLE BLOOD SAMPLE WITH A BIOCHIP ARRAY ON THE EVIDENCE INVESTIGATOR ANALYSER

Introduction

A variety of over the counter and prescription drugs can cause drug overdoses when not used properly. The monitoring of these drugs involves measuring drug concentrations in biological matrices.

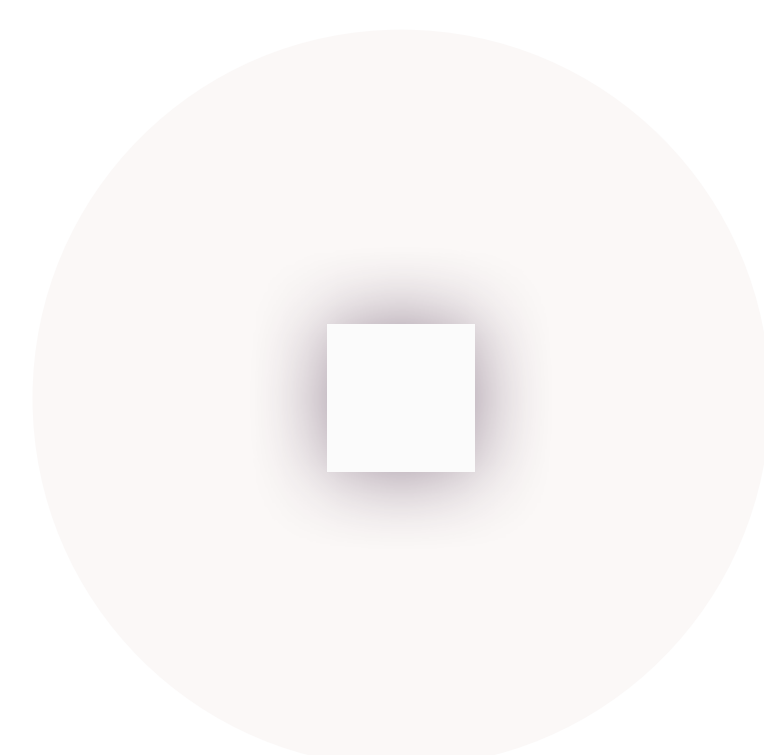
Biochip array technology allows the simultaneous screening of over the counter and commonly used prescription drugs from a single sample, which increases the screening capacity and facilitates the monitoring of the use or misuse of these compounds. This study reports the application of a biochip array to the simultaneous screening of acetaminophen, dextromethorphan, escitalopram, ethyl glucuronide, fluoxetine, haloperidol, ibuprofen, methylphenidate, salicylate, sertraline, tramadol, trazodone, tricyclic antidepressants from a single blood sample on the Evidence Investigator analyser.

Methodology

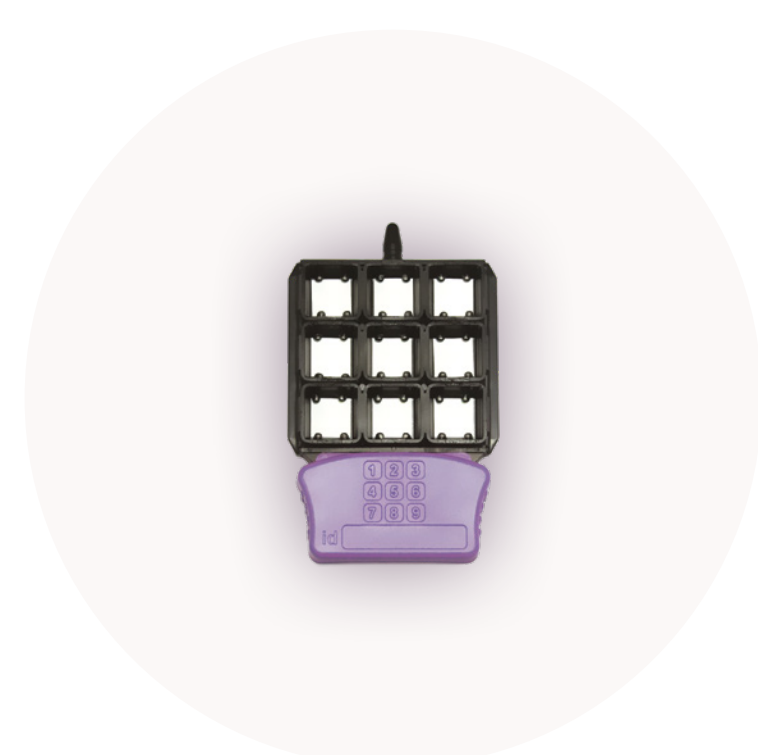
Simultaneous competitive biochip-based immunoassays applied to the semi-automated biochip analyser Evidence Investigator were employed (EV3807, EV3602, Randox Toxicology, Crumlin, UK).

The capture ligands were immobilized and stabilized on the biochip surface (9mm x 9mm) defining discrete test regions, the biochip was also the vessel for the immunoreactions.

The system incorporates dedicated software to process and archive the multiple data generated. Samples were diluted 4-fold prior analysis.



Biochip
(9mm x 9mm)



Biochip Carrier
(3 x 3 Biochips)



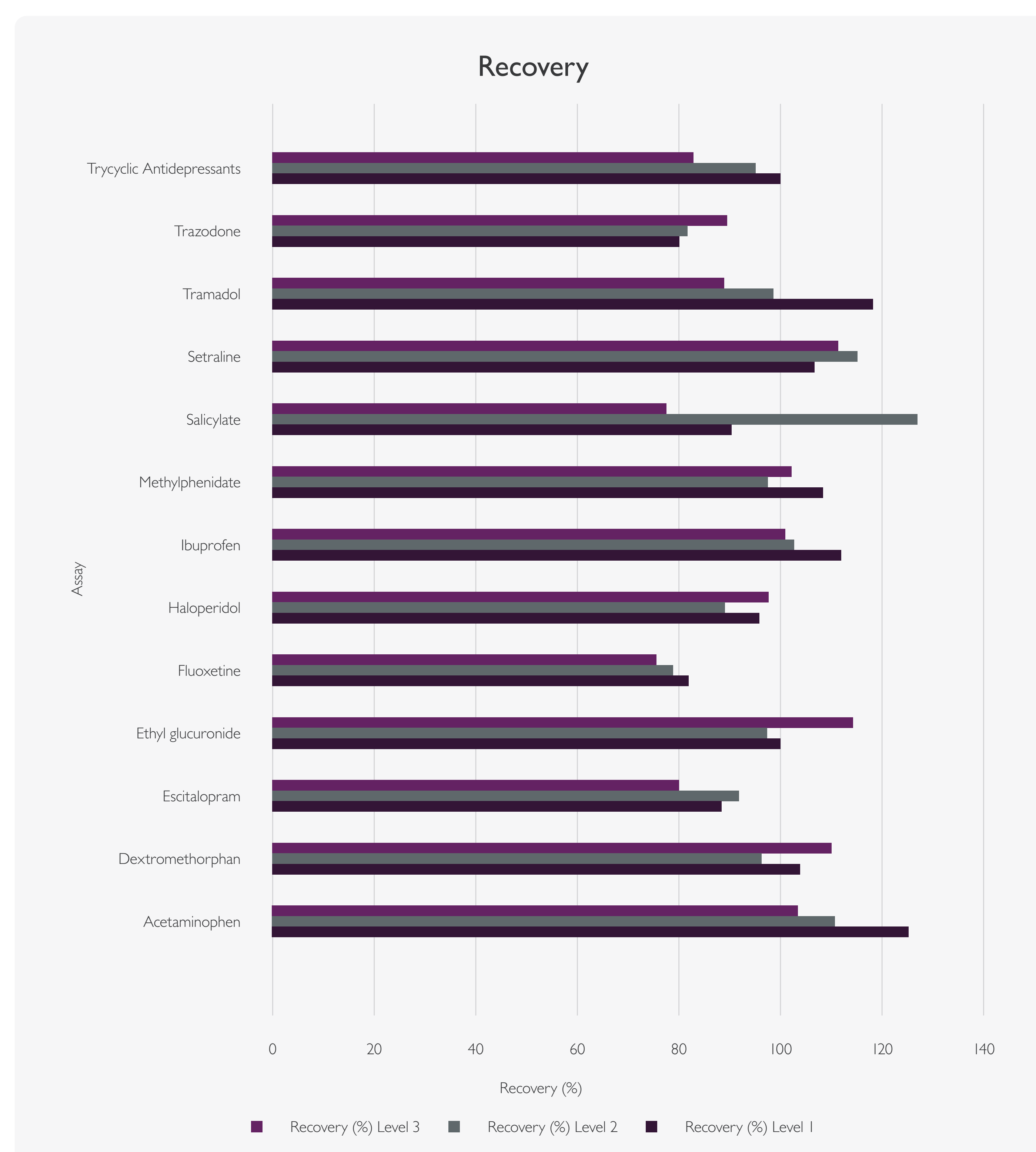
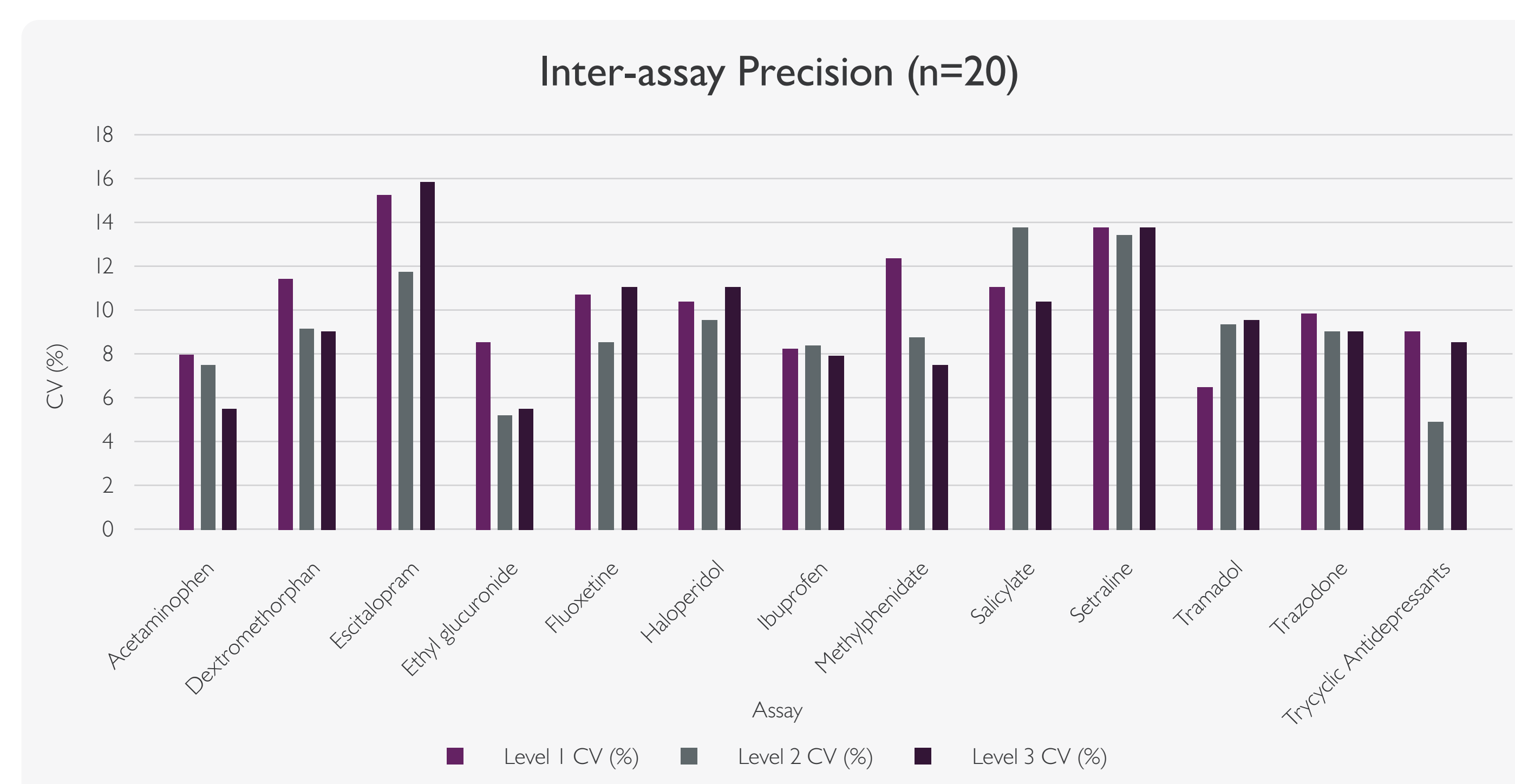
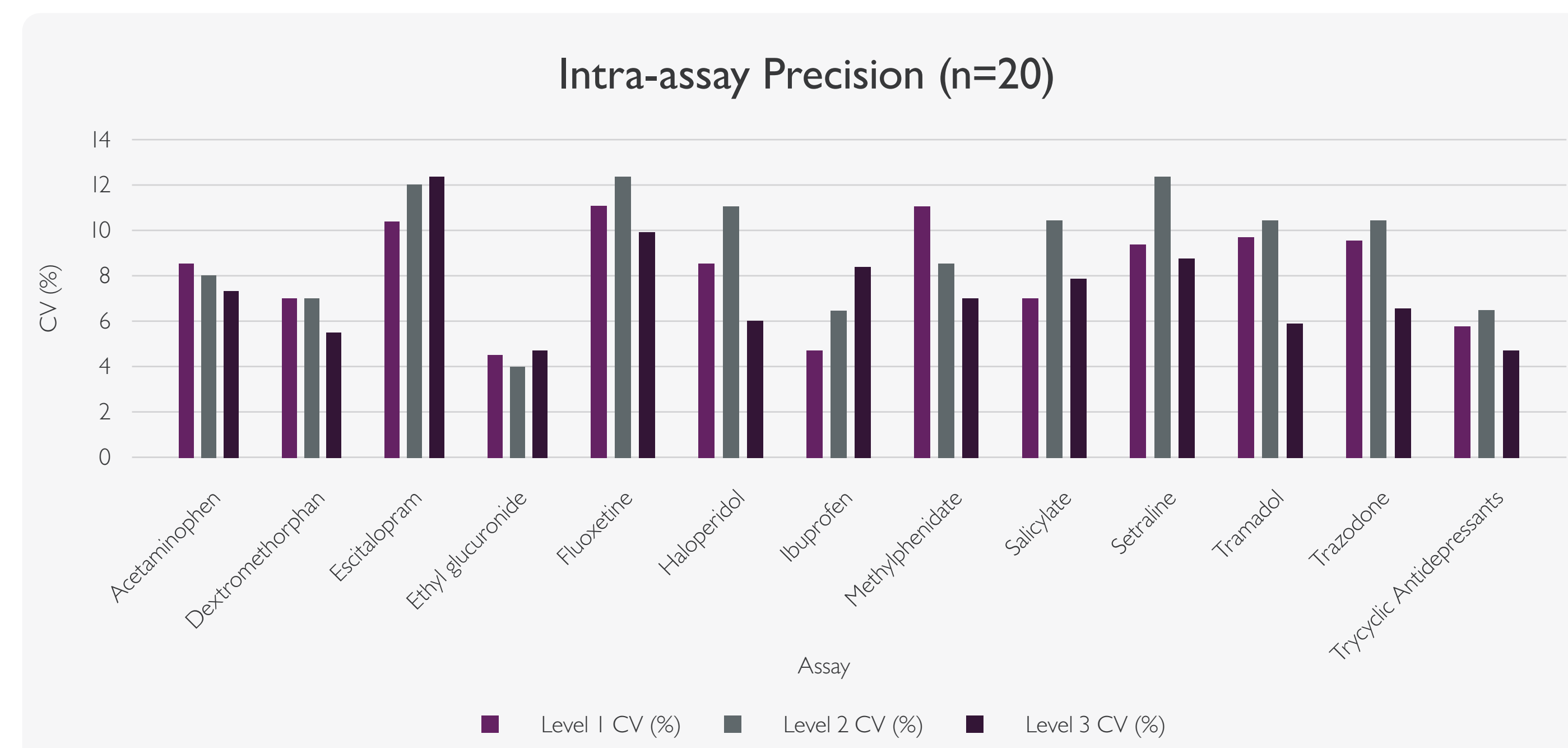
Semi-Automated Benchtop Analyser
Evidence Investigator

Results

Limit of Detection Values (LOD) in Neat Whole Blood of the Simultaneous Immunoassays

Assay	LOD	Assay range*
Acetaminophen	4.18 µg/mL	0-695 µg/mL
Dextromethorphan	0.24 ng/mL	0-70 ng/mL
Escitalopram	0.17 ng/mL	0-435 ng/mL
Ethyl glucuronide	0.09 µg/mL	0-25 µg/mL
Fluoxetine	0.73 ng/mL	0-680 ng/mL
Haloperidol	0.50 ng/mL	0-145 ng/mL
Ibuprofen	1.88 µg/mL	0-820 µg/mL
Methylphenidate	8.81 ng/mL	0-1750 ng/mL
Salicylate	1.98 µg/mL	0-665 µg/mL
Sertraline	1.08 ng/mL	0-1430 ng/mL
Tramadol	0.08 ng/mL	0-35 ng/mL
Trazodone	0.15 ng/mL	0-240 ng/mL
Tricyclic Antidepressants (nortriptyline)	2.03 ng/mL	0-660 ng/mL

* Individual ranges of calibrator batches may vary slightly



EV3807 200214rw

Conclusion

Data show applicability of the biochip array to the simultaneous screening of prescription and over the counter drugs from a single blood sample when applied to the Evidence Investigator analyser. This application increases the screening capacity and facilitates the monitoring of the use or misuse of drugs.