

ESR Forensic Toxicology

Routine Blood Screening Capability

May 2022

1. Introduction

The following tables provide a list of the drugs and metabolites that are currently included across ESR's routine Forensic Toxicology blood screening capability using LC-TOFMS¹ and LC-MSMS² instrumentation.

2. Generalised approach

Most coronial cases are screened using the routine LC-TOFMS screen for the drugs and metabolites listed in Table 1.

ESR also has five targeted LC-MSMS screening methods, the details of which are listed in Table 2.

There is some overlap in the compounds listed in the routine LC-TOFMS screen and those listed in the LC-MSMS screens. It is important to note that routine cases are not automatically screened for alcohol or other drugs, including those drugs and metabolites listed only in Table 2 below.

It is necessary to specifically and separately request analyses on the toxicology request form for: alcohol and other volatile compounds, cannabis, carbon monoxide, and those drugs and metabolites listed only in Table 2 such as GHB or synthetic cannabinoids.

3. Considerations for blood

Low blood volume and/or the condition of the blood may influence the screening options. In such cases, a combination of some or all of the LC-MSMS screens from Table 2 are likely to be undertaken instead of the routine LC-TOFMS screen.

4. Extended analysis capability

ESR's Forensic Toxicology unit can analyse for a wider range of drugs and poisons, in a broad range of matrices, including those not listed in these tables. We are also able to develop bespoke analyses on a case-by-case basis.

Please contact us on 0800 377 869 (0800 ESR TOX) or email us at toxicology@esr.cri.nz if you would like to discuss other testing capability or methodology.

¹LC-TOFMS – Liquid chromatography with time-of-flight mass spectrometric detection

²LC-MSMS – Liquid chromatography with tandem mass spectrometric detection

Table 1: Drugs and metabolites included on the routine LC-TOFMS Screen

Antidepressants	Antipsychotics	Drugs of Abuse Continued	Narcotics Continued
Amitriptyline Amoxapine Bupropion Citalopram Clomipramine Desipramine Desmethylmirtazapine Dothiepin Doxepin Fluoxetine Imipramine Maprotiline Mianserin Mirtazapine Mirtazapine-N-oxide Moclobemide Nefazodone Norfluoxetine Nortriptyline O-Desmethylvenlafaxine Paroxetine Phenelzine Sertraline Tranylcypromine Trazodone Trimipramine Venlafaxine	Amisulpride Aripiprazole Chlorpromazine Clozapine Droperidol Flupenthixol Fluphenazine Haloperidol Loxapine Methotrimeprazine Olanzapine Paliperidone Pericyazine Pimozide Prochlorperazine Promazine Quetiapine Risperidone Thioridazine Thiothixene Trifluoperazine Trifluopromazine Ziprasidone Zuclopenthixol	Methylphenidate Modafinil Naphyrone N-Methylephedrine Pemoline Pentylone Phencyclidine Phendimetrazine Phentermine Phenylephrine Phenylpropanolamine PMA Pseudoephedrine/Ephedrine Pyrovalerone Synephrine Trifluoromethylphenylpiperazine	Pethidine Tramadol
			Sedatives 7-Aminoclonazepam 7-Aminoflunitrazepam 7-Aminonitrazepam Alpha-Hydroxyalprazolam Alpha-Hydroxytriazolam Alprazolam Bromazepam Chlordiazepoxide Clobazam Clonazepam Dantrolene Diazepam Etizolam Flunitrazepam Glutethimide Lorazepam Lormetazepam Medazepam Meprobamate Midazolam Nitrazepam Nordiazepam Oxazepam Phenazepam Prazepam Temazepam Triazolam Zolpidem Zopiclone
		Heart Medications Acebutolol Alprenolol Amiodarone Amlodipine Atenolol Benzatropine Bisoprolol Carvedilol Desacetyldiltiazem Diltiazem Labetalol Metoprolol Nadolol Oxprenolol Pindolol Propranolol Sotalol Timolol Verapamil	
	Barbiturates Amobarbital Barbital Butobarbital Pentobarbital Phenobarbital Secobarbital Thiopental		
Antihistamines Betahistine Brompheniramine Butethamate Cetirizine Chlorpheniramine Clemastine Cyclizine Cyproheptadine Diphenhydramine Doxylamine Hydroxyzine Loratadine Pheniramine Physostigmine Promethazine Triprolidine	Drugs of Abuse 3-Fluoromethcathinone 4-Methylephedrine 4-Methylethcathinone 4-Methylmethcathinone Alpha-PVP Amphetamine Benzoyllecgonine Benzylpiperazine Butylone Cocaine Dextromethorphan Diethylpropion Dimethyltryptamine Ecgonine methyl ester Eutylone Fenfluramine Fenproporex Ketamine LSD MDA MDMA Methamphetamine Methylenedioxypyrovalerone Methylone	Narcotics 6-Monoacetylmorphine Alfentanil Apomorphine Codeine Dextropropoxyphene Dihydrocodeine Dihydromorphine EDDP EMDP Fentanyl Hydrocodone Hydromorphone Methadone Morphine Naloxone Noroxycodone Norpropoxyphene O-Desmethyltramadol Oxycodone Oxymorphone	Synthetic Cannabinoids* 4F-MDMB-BINACA 4F-MDMB-BINACA butanoic acid 5F-MDMB-PICA ADB-FUBINACA CUMYL-PEGACLONE MDMB-4en-PINACA MDMB-4en-PINACA butanoic acid
Anticonvulsants Carbamazepine Gabapentin Lacosamide Lamotrigine Levetiracetam Methsuximide Normethsuximide Phenytoin Pregabalin Primidone Sulthiame Topiramate			Miscellaneous Atropine Bupivacaine Caffeine Colchicine Cotinine Kavain Lignocaine Mepivacaine Metoclopramide Orphenadrine Paracetamol Phenethylamine Pholcodine Rocuronium Ropivacaine Sildenafil Sumatriptan Theobromine Warfarin

** Please specify synthetic cannabinoid screening to ensure analysis for full capacity of synthetic cannabinoids*

Table 2: Drugs and metabolites included on the LC-MSMS screens - across five separate analyses

Anticonvulsants	Drugs of Abuse	Narcotics Continued	Synthetic Cannabinoids Continued
Carbamazepine Gabapentin Lamotrigine Levetiracetam Phenytoin Pregabalin Topiramate	Amphetamine Benzoyllecgonine Benzylpiperazine Cocaine Ecgonine Methyl Ester Ephedrine Ephylone Ketamine MDA MDMA MDPV Mephedrone Methamphetamine Methylone Methylphenidate pFPP Phentermine Pseudoephedrine THC THC-acid	Naloxone Oxycodone Oxymorphone Tramadol	EG-018 FUB PB 22 JWH-018 <i>N</i> -5-hydroxypentyl JWH-073 <i>N</i> -4-hydroxybutyl JWH-200 5-hydroxyindole MDMB-4en-PINACA MDMB-4en-PINACA butanoic acid MDMB-FUBINACA acid MDMB-CHMICA MDMB-CHMICA acid MDMB-FUBICA acid MDMB-PICA acid MMB-018 acid MMB-2201 acid MMB-CHMICA acid NM 2201 PB-22 3-carboxyindole PB-22 <i>N</i> -5-hydroxypentyl SDB 006
Antidepressants	Heart Medications	Sedatives	Miscellaneous
Amitriptyline Bupropion Citalopram Clomipramine Desipramine Dothiepin Doxepin Fluoxetine Imipramine Mianserin Mirtazapine Norfluoxetine Nortriptyline Paroxetine Sertraline Venlafaxine	Acebutolol Alprenolol Atenolol Carvedilol Labetalol Metoprolol Nadolol Oxprenolol Pindolol Propranolol Timolol	Alprazolam Clobazam Clonazepam Diazepam Flunitrazepam Lorazepam Midazolam Nitrazepam Nordiazepam Oxazepam Temazepam Triazolam Zolpidem Zopiclone	Amobarbital Butobarbital Ethyl glucuronide (ethanol metabolite) Ethyl sulfate (ethanol metabolite) Gamma-hydroxybutyrate (GHB/GBL) Ibuprofen Metformin Metoclopramide Naproxen Orphenadrine Paracetamol Pentobarbital Phenobarbital Pholcodine Salbutamol Salicylic acid Secobarbital Sumatriptan U47700 Warfarin
Antihistamines	Narcotics	Synthetic Cannabinoids	
Cetirizine Cyclizine Diphenhydramine Hydroxyzine Promethazine	6-Monoacetylmorphine Buprenorphine Codeine Dextromethorphan Dextropropoxyphene Dihydrocodeine EDDP Fentanyl Hydrocodone Hydromorphone Methadone Morphine	4F-MDMB-BINACA 4F-MDMB-BINACA butanoic acid 5CI-AB-PINACA 5F-AB-PINACA 5F-ADB 5F-ADB acid 5F-AKB-48 5F-AMB acid 5F-CUMYL PINACA 5F-MDMB-PICA 5F-MDMB-PICA acid 5F-PB 22 5F-PB-22 3-carboxyindole AB CHMINACA AB FUBINACA AB-CHMINACA M1A AB-FUBINACA M2B ADB-FUBINACA AM2201 <i>N</i> -4-hydroxypentyl AMB-FUBICA acid AMB-FUBINACA AMB-FUBINACA acid BB-22 BB-22 3-carboxyindole CUMYL-PEGACLONE	
Antipsychotics			
Aripiprazole Chlorpromazine Clozapine Haloperidol Methotrimeprazine Olanzapine Pimozide Promazine Quetiapine Risperidone Thioridazine Trifluoperazine Ziprasidone Zuclopenthixol			