PRICING PROPOSAL (5.1.9)

All of the Axis panels described in the Technical and Pricing Proposals meet the requirements for report content and toxicology consultation (5.1.9.6 and 5.1.9.7). Please reference Exhibit J for a Sample Report. Analysis can be performed on antemortem or postmortem specimens of the described matrices, including decomposed tissues (5.1.9.7 and 5.1.9.8). For non-biological testing, see Trace in the price list (5.1.9.6). Pricing includes all shipping costs (5.1.9.9), supplies (5.1.9.10), and any referred testing (5.1.9.11). Storage from 12-24 months is listed at the previously agreed flat fee in the Advanced Pricing table and individual cases can be retained for longer than 2 years at the Extended Storage rate in the 2023 Price List (5.1.9.12).

DISCOUNTED ADVANCED PRICING FOR THE RFP

This listing of related panels to the Technical Proposal submission states whether ordering services will include testing on all specimens submitted for testing or whether separate charges will be incurred on a per specimen basis (5.1.9.5). The 70510: Comprehensive Drug Panel, Blood, Urine Vitreous and the 70530: Drugs of Abuse Panel, Blood, Urine Vitreous panels are bundled charges for testing blood, urine, and vitreous, as described in the Whole Case Approach. All other order codes are charged on a per specimen basis.

Order Code	Test Name, Specimens Tested	2018-22	RFP Advanced Pricing
70510:	Comprehensive Drug Panel, Blood, Urine Vitreous	$ 200.00	$ 200.00
70510FL:	Comprehensive Drug Panel, Fluid	$ 425.00	$ 350.00
70510T:	Comprehensive Drug Panel, Tissue	$ 325.00	$ 350.00
70510V:	Comprehensive Drug Panel, Vitreous	$ 325.00	$ 350.00
70530:	Drugs of Abuse Panel, Blood, Urine Vitreous	$ 130.00	$ 130.00
70555FL:	Drugs of Abuse Panel, Fluid	$ 245.00	$ 245.00
70555T:	Drugs of Abuse Panel, Tissue	$ 245.00	$ 245.00
70555V:	Drugs of Abuse Panel, Vitreous	$ 245.00	$ 245.00
13610:	Psychoactive Substances Panel, Blood		$ 200.00
13610U:	Psychoactive Substances Panel, Urine		$ 200.00
13810:	Designer Opioids Panel, Blood		$ 200.00
13810U:	Designer Opioids Panel, Urine		$ 200.00
13810V:	Designer Opioids Panel, Vitreous		$ 200.00
13710:	Novel Emerging Substances Panel, Blood		$ 200.00
13710U:	Novel Emerging Substances Panel, Urine		$ 200.00
13710V:	Novel Emerging Substances Panel, Vitreous		$ 200.00
42130:	Synthetic Cannabinoids, Blood		$ 200.00
32400:	Electrolytes Panel (5.1.9.4)	$ 75.00	$ 20.00
44060:	Carbon Monoxide, Blood		$ 65.00
	Bulk Extended 2nd Year Storage (monthly flat fee)		$ 500.00
	Maximum Charge for a single case (5.1.9.3)		**$900.00**

2023 PRICE LIST (5.1.9.1 AND 5.1.9.2)

Axis Order Code	Test Name	2023 List Price
40600	Acetaminophen, Blood	$ 140.00
40600FL	Acetaminophen, Fluid	$ 235.00
40600T	Acetaminophen, Tissue	$ 245.00
40600V	Acetaminophen, Vitreous	$ 235.00
45500	Acetone, Blood	$ 110.00
45500FL	Acetone, Fluid	$ 140.00
45500T	Acetone, Tissue	$ 155.00
45500V	Acetone, Vitreous	$ 140.00
44000	Albuterol, Blood	$ 368.00
44500	Alprazolam, Blood	$ 175.00
44500FL	Alprazolam, Fluid	$ 275.00
44500T	Alprazolam, Tissue	$ 285.00
44500V	Alprazolam, Vitreous	$ 275.00
43010	Amiodarone and Metabolite, Blood	$ 140.00
41500	Amitriptyline and Metabolite, Blood	$ 140.00
41500FL	Amitriptyline and Metabolite, Fluid	$ 235.00
41500T	Amitriptyline and Metabolite, Tissue	$ 245.00
41500V	Amitriptyline and Metabolite, Vitreous	$ 235.00
44510	Amobarbital, Blood	$ 140.00
44510FL	Amobarbital, Fluid	$ 235.00
44510T	Amobarbital, Tissue	$ 245.00
44510V	Amobarbital, Vitreous	$ 235.00
41510	Amoxapine and Metabolite, Blood	$ 341.00
45075	Amphetamine, Blood	$ 140.00
45075FL	Amphetamine, Fluid	$ 235.00
45075V	Amphetamine, Vitreous	$ 235.00
45130	Amphetamines Panel, Blood	$ 205.00
45130FL	Amphetamines Panel, Fluid	$ 275.00
45130T	Amphetamines Panel, Tissue	$ 285.00
45130V	Amphetamines Panel, Vitreous	$ 275.00
10072	Amphetamines, Urine	$ 205.00
45075T	Amphetemine, Tissue	$ 245.00
44030U	Anabolic Steroids, Urine	$ 211.00
41710	Antidepressants, Blood	$ 205.00
41710FL	Antidepressants, Fluid	$ 275.00
41710T	Antidepressants, Tissue	$ 285.00
41710V	Antidepressants, Vitreous	$ 275.00
42400	Aripiprazole, Blood	$ 175.00
47000	Arsenic, Blood	$ 171.00
43020	Atenolol, Blood	$ 205.00
43020FL	Atenolol, Fluid	$ 340.00
43020T	Atenolol, Tissue	$ 360.00

Axis Order Code	Test Name	2023 List Price
43020V	Atenolol, Vitreous	$ 340.00
45140	Atomoxetine, Blood	$ 564.00
40000	Baclofen, Blood	$ 405.00
44525	Barbiturates, Blood	$ 205.00
44525FL	Barbiturates, Fluid	$ 275.00
44525T	Barbiturates, Tissue	$ 285.00
44525V	Barbiturates, Vitreous	$ 275.00
44530	Benzodiazepine Panel, Blood	$ 205.00
44530FL	Benzodiazepine Panel, Fluid	$ 275.00
44530T	Benzodiazepine Panel, Tissue	$ 285.00
44530V	Benzodiazepine Panel, Vitreous	$ 275.00
44040	Benztropine, Blood	$ 217.00
33570	Betahydroxybutyric Acid, Blood	$ 273.00
33570FL	Betahydroxybutyric Acid, Fluid	$ 337.00
43085	Bisoprolol, Blood	$ 175.00
43085FL	Bisoprolol, Fluid	$ 275.00
43085T	Bisoprolol, Tissue	$ 285.00
43085V	Bisoprolol, Vitreous	$ 275.00
42200	Brompheniramine, Blood	$ 311.00
40800	Bupivacaine, Blood	$ 182.00
40610	Buprenorphine and Metabolite, Blood	$ 175.00
40610FL	Buprenorphine and Metabolite, Fluid	$ 275.00
40610T	Buprenorphine and Metabolite, Tissue	$ 285.00
40610V	Buprenorphine and Metabolite, Vitreous	$ 275.00
41520	Bupropion, Blood	$ 175.00
41520FL	Bupropion, Fluid	$ 275.00
41520T	Bupropion, Tissue	$ 285.00
41520U	Bupropion, Urine	$ 175.00
41520V	Bupropion, Vitreous	$ 275.00
42800	Buspirone, Blood	$ 192.00
44540	Butabarbital, Blood	$ 140.00
44540FL	Butabarbital, Fluid	$ 235.00
44540T	Butabarbital, Tissue	$ 245.00
44540V	Butabarbital, Vitreous	$ 235.00
44550	Butalbital, Blood	$ 140.00
44550FL	Butalbital, Fluid	$ 235.00
44550T	Butalbital, Tissue	$ 245.00
44550V	Butalbital, Vitreous	$ 235.00
40620	Butorphanol, Blood	$ 548.00
45010	Caffeine, Blood	$ 211.00
45010FL	Caffeine, Fluid	$ 403.00
45010V	Caffeine, Vitreous	$ 403.00

Axis Order Code	Test Name	2023 List Price
44050	Cannabinoids, Blood	$ 160.00
44050FL	Cannabinoids, Fluid	$ 235.00
44050T	Cannabinoids, Tissue	$ 245.00
10166	Cannabinoids, Urine	$ 140.00
44050V	Cannabinoids, Vitreous	$ 235.00
41030	Carbamazepine and Metabolite, Blood	$ 175.00
41030FL	Carbamazepine and Metabolite, Fluid	$ 235.00
41030T	Carbamazepine and Metabolite, Tissue	$ 245.00
41030V	Carbamazepine and Metabolite, Vitreous	$ 235.00
44060	Carbon Monoxide, Blood	$ 95.00
40010	Carisoprodal and Metabolite, Blood	$ 140.00
40010FL	Carisoprodal and Metabolite, Fluid	$ 235.00
40010T	Carisoprodal and Metabolite, Tissue	$ 245.00
40010V	Carisoprodal and Metabolite, Vitreous	$ 235.00
42210	Cetirizine, Blood	$ 175.00
42210FL	Cetirizine, Fluid	$ 275.00
42210T	Cetirizine, Tissue	$ 285.00
42210U	Cetirizine, Urine	$ 175.00
42210V	Cetirizine, Vitreous	$ 275.00
44560	Chlordiazepoxide and Metabolite, Blood	$ 175.00
44560FL	Chlordiazepoxide and Metabolite, Fluid	$ 275.00
44560T	Chlordiazepoxide and Metabolite, Tissue	$ 285.00
44560V	Chlordiazepoxide and Metabolite, Vitreous	$ 275.00
41685	Chlorophenylpiperazine (mCPP), Blood	$ 175.00
41685FL	Chlorophenylpiperazine (mCPP), Fluid	$ 275.00
41685T	Chlorophenylpiperazine (mCPP), Tissue	$ 285.00
41685V	Chlorophenylpiperazine (mCPP), Vitreous	$ 275.00
41440	Chlorothiazide, Blood	$ 280.00
42220	Chlorpheniramine, Blood	$ 140.00
42220FL	Chlorpheniramine, Fluid	$ 235.00
42220T	Chlorpheniramine, Tissue	$ 245.00
42220V	Chlorpheniramine, Vitreous	$ 235.00
42410	Chlorpromazine, Blood	$ 182.00
41530	Citalopram, Blood	$ 140.00
41530FL	Citalopram, Fluid	$ 235.00
41530T	Citalopram, Tissue	$ 245.00
41530U	Citalopram, Urine	$ 140.00
41530V	Citalopram, Vitreous	$ 235.00
41540	Clomipramine and Metabolite, Blood	$ 140.00
41540FL	Clomipramine and Metabolite, Fluid	$ 235.00
41540T	Clomipramine and Metabolite, Tissue	$ 245.00
41540V	Clomipramine and Metabolite, Vitreous	$ 235.00

Axis Order Code	Test Name	2023 List Price
41045	Clonazepam and Metabolite, Blood	$ 175.00
41045FL	Clonazepam and Metabolite, Fluid	$ 275.00
41045T	Clonazepam and Metabolite, Tissue	$ 285.00
41045V	Clonazepam and Metabolite, Vitreous	$ 275.00
42420	Clozapine and Metabolite, Blood	$ 140.00
42420FL	Clozapine and Metabolite, Fluid	$ 235.00
42420T	Clozapine and Metabolite, Tissue	$ 245.00
42420V	Clozapine and Metabolite, Vitreous	$ 235.00
45020	Cocaine and Metabolites, Blood	$ 140.00
45020FL	Cocaine and Metabolites, Fluid	$ 235.00
45020T	Cocaine and Metabolites, Tissue	$ 245.00
45020V	Cocaine and Metabolites, Vitreous	$ 235.00
70510	Comprehensive Drug Panel, Blood	$ 392.00
70510FL	Comprehensive Drug Panel, Fluid	$ 610.00
70510T	Comprehensive Drug Panel, Tissue	$ 610.00
70510V	Comprehensive Drug Panel, Vitreous	$ 610.00
44080	Cyanide, Blood	$ 137.00
40030	Cyclobenzaprine, Blood	$ 140.00
40030FL	Cyclobenzaprine, Fluid	$ 235.00
40030T	Cyclobenzaprine, Tissue	$ 245.00
40030V	Cyclobenzaprine, Vitreous	$ 235.00
44565	Demoxepam, Blood	$ 140.00
44565FL	Demoxepam, Fluid	$ 235.00
44565T	Demoxepam, Tissue	$ 245.00
44565V	Demoxepam, Vitreous	$ 235.00
13810	Designer Opioids Panel, Blood	$ 325.00
13810U	Designer Opioids Panel, Urine	$ 325.00
13810V	Designer Opioids Panel, Vitreous	$ 325.00
42240	Dextromethorphan, Blood	$ 140.00
42240FL	Dextromethorphan, Fluid	$ 235.00
42240T	Dextromethorphan, Tissue	$ 245.00
42240V	Dextromethorphan, Vitreous	$ 235.00
41050	Diazepam and Metabolites, Blood	$ 175.00
41050FL	Diazepam and Metabolites, Fluid	$ 275.00
41050T	Diazepam and Metabolites, Tissue	$ 285.00
41050V	Diazepam and Metabolites, Vitreous	$ 275.00
40210	Diclofenac, Blood	$ 205.00
40210U	Diclofenac, Urine	$ 205.00
44750	Diethylene Glycol, Blood	$ 503.00
40690	Dihydrocodeine, Blood	$ 175.00
40690FL	Dihydrocodeine, Fluid	$ 275.00
40690T	Dihydrocodeine, Tissue	$ 285.00

Axis Order Code	Test Name	2023 List Price
40690V	Dihydrocodeine, Vitreous	$ 275.00
43120	Diltiazem, Blood	$ 367.00
42250	Diphenhydramine, Blood	$ 140.00
42250FL	Diphenhydramine, Fluid	$ 235.00
42250T	Diphenhydramine, Tissue	$ 245.00
42250V	Diphenhydramine, Vitreous	$ 235.00
70538B	DOA w/ Naltrexone, Blood	$ 295.00
44260	Donepezil, Blood	$ 205.00
44260FL	Donepezil, Fluid	$ 474.00
44260V	Donepezil, Vitreous	$ 474.00
41470	Dothiepin,Blood	$ 715.00
41560	Doxepin and Metabolite, Blood	$ 140.00
41560FL	Doxepin and Metabolite, Fluid	$ 235.00
41560T	Doxepin and Metabolite, Tissue	$ 245.00
41560V	Doxepin and Metabolite, Vitreous	$ 235.00
42260	Doxylamine, Blood	$ 175.00
42260FL	Doxylamine, Fluid	$ 235.00
42260T	Doxylamine, Tissue	$ 245.00
42260V	Doxylamine, Vitreous	$ 235.00
70530	Drugs of Abuse Panel, Blood	$ 270.00
70530FL	Drugs of Abuse Panel, Fluid	$ 400.00
70530T	Drugs of Abuse Panel, Tissue	$ 400.00
70080	Drugs of Abuse Panel, Urine	$ 270.00
70530V	Drugs of Abuse Panel, Vitreous	$ 400.00
41720	Duloxetine, Blood	$ 175.00
41720FL	Duloxetine, Fluid	$ 235.00
41720T	Duloxetine, Tissue	$ 245.00
11720	Duloxetine, Urine	$ 140.00
41720V	Duloxetine, Vitreous	$ 235.00
32400	Electrolyte Panel, Vitreous	$ 104.00
43130	Ephedrine, Blood	$ 140.00
43130FL	Ephedrine, Fluid	$ 235.00
43130T	Ephedrine, Tissue	$ 245.00
43130U	Ephedrine, Urine	$ 140.00
43130V	Ephedrine, Vitreous	$ 235.00
44730	Estazolam, Blood	$ 474.00
45640	Ethanol, Blood	$ 110.00
45640FL	Ethanol, Fluid	$ 140.00
45640T	Ethanol, Tissue	$ 155.00
45640V	Ethanol, Vitreous	$ 140.00
45530	Ethylene Glycol, Blood	$ 297.00
40240	Etodolac, Blood	$ 175.00

Axis Order Code	Test Name	2023 List Price
40240FL	Etodolac, Fluid	$ 275.00
40240T	Etodolac, Tissue	$ 285.00
40240U	Etodolac, Urine	$ 175.00
40240V	Etodolac, Vitreous	$ 275.00
40435	Etomidate, Blood	$ 175.00
40435FL	Etomidate, Fluid	$ 275.00
40435T	Etomidate, Tissue	$ 285.00
40435U	Etomidate, Urine	$ 175.00
40435V	Etomidate, Vitreous	$ 275.00
90301	Extended Storage - 1 Year	$ 220.00
41080	Felbamate, Blood	$ 519.00
40410	Fentanyl, Blood	$ 140.00
40410FL	Fentanyl, Fluid	$ 235.00
40410T	Fentanyl, Tissue	$ 245.00
40420	Fentanyl, Vitreous	$ 235.00
43140	Flecainide, Blood	$ 264.00
44570	Flunitrazepam, Blood	$ 140.00
44570FL	Flunitrazepam, Fluid	$ 235.00
44570T	Flunitrazepam, Tissue	$ 245.00
44570V	Flunitrazepam, Vitreous	$ 235.00
41580	Fluoxetine and Metabolite, Blood	$ 175.00
41580FL	Fluoxetine and Metabolite, Fluid	$ 235.00
41580T	Fluoxetine and Metabolite, Tissue	$ 245.00
41580V	Fluoxetine and Metabolite, Vitreous	$ 235.00
42430	Fluphenazine, Blood	$ 253.00
44585	Flurazepam and Metabolite, Blood	$ 349.00
41590	Fluvoxamine, Blood	$ 249.00
43150	Furosemide, Blood	$ 267.00
41090	Gabapentin, Blood	$ 140.00
41090FL	Gabapentin, Fluid	$ 235.00
41090T	Gabapentin, Tissue	$ 245.00
41090V	Gabapentin, Vitreous	$ 235.00
44590	Gamma Hydroxybutyrate (GHB), Blood	$ 205.00
10835	Glucose, Urine	$ 163.00
42270	Guaifenesin, Blood	$ 205.00
42270FL	Guaifenesin, Fluid	$ 340.00
42270T	Guaifenesin, Tissue	$ 360.00
42270U	Guaifenesin, Urine	$ 205.00
42270V	Guaifenesin, Vitreous	$ 340.00
42440	Haloperidol, Blood	$ 161.00
43160	Hydrochlorothiazide, Blood	$ 175.00
43160FL	Hydrochlorothiazide, Fluid	$ 275.00

Axis Order Code	Test Name	2023 List Price
43160T	Hydrochlorothiazide, Tissue	$ 285.00
43160V	Hydrochlorothiazide, Vitreous	$ 275.00
40430	Hydrocodone, Blood	$ 140.00
40430FL	Hydrocodone, Fluid	$ 235.00
40430T	Hydrocodone, Tissue	$ 245.00
40430V	Hydrocodone, Vitreous	$ 235.00
40440	Hydromorphone, Blood	$ 140.00
40440FL	Hydromorphone, Fluid	$ 235.00
40440T	Hydromorphone, Tissue	$ 245.00
40440V	Hydromorphone, Vitreous	$ 235.00
40355	Hydroxychloroquine, Blood	$ 322.00
40355FL	Hydroxychloroquine, Fluid	$ 355.00
40355T	Hydroxychloroquine, Tissue	$ 388.00
40355V	Hydroxychloroquine, Vitreous	$ 355.00
42280	Hydroxyzine, Blood	$ 205.00
42280FL	Hydroxyzine, Fluid	$ 340.00
42280T	Hydroxyzine, Tissue	$ 360.00
42280V	Hydroxyzine, Vitreous	$ 340.00
40260	Ibuprofen, Blood	$ 140.00
40260FL	Ibuprofen, Fluid	$ 235.00
40260T	Ibuprofen, Tissue	$ 245.00
40260V	Ibuprofen, Vitreous	$ 235.00
41600	Imipramine and Metabolite, Blood	$ 140.00
41600FL	Imipramine and Metabolite, Fluid	$ 235.00
41600T	Imipramine and Metabolite, Tissue	$ 245.00
41600V	Imipramine and Metabolite, Vitreous	$ 235.00
45710	Inhalants Panel, Blood	$ 495.00
45540	Isopropanol, Blood	$ 110.00
45540FL	Isopropanol, Fluid	$ 140.00
45540T	Isopropanol, Tissue	$ 155.00
45540V	Isopropanol, Vitreous	$ 140.00
40810	Ketamine and Metabolite, Blood	$ 140.00
40810FL	Ketamine and Metabolite, Fluid	$ 244.00
40810T	Ketamine and Metabolite, Tissue	$ 437.00
40810V	Ketamine and Metabolite, Vitreous	$ 244.00
33500	Ketone Panel, Blood	$ 397.00
17070	Ketone Panel, Fluid	$ 352.00
40280	Ketoprofen, Blood	$ 483.00
43340	Ketorolac, Blood	$ 453.00
43315	Labetalol, Blood	$ 626.00
43315FL	Labetalol, Fluid	$ 688.00
43315V	Labetalol, Vitreous	$ 688.00

Axis Order Code	Test Name	2023 List Price
41095	Lacosamide, Blood	$ 260.00
41100	Lamotrigine, Blood	$ 175.00
41100FL	Lamotrigine, Fluid	$ 275.00
41100T	Lamotrigine, Tissue	$ 285.00
41100V	Lamotrigine, Vitreous	$ 275.00
41110	Levetiracetam, Blood	$ 140.00
41110FL	Levetiracetam, Fluid	$ 235.00
41110T	Levetiracetam, Tissue	$ 245.00
41110V	Levetiracetam, Vitreous	$ 235.00
40830	Lidocaine, Blood	$ 140.00
40830FL	Lidocaine, Fluid	$ 235.00
40830T	Lidocaine, Tissue	$ 245.00
40830V	Lidocaine, Vitreous	$ 235.00
42450	Lithium, Blood	$ 118.00
42080	Loperamide, Blood	$ 175.00
42050	Loratadine and Metabolite, Blood	$ 343.00
41120	Lorazepam, Blood	$ 175.00
41120FL	Lorazepam, Fluid	$ 275.00
41120T	Lorazepam, Tissue	$ 285.00
41120V	Lorazepam, Vitreous	$ 275.00
44110	Lysergic Acid Diethylamide (LSD), Blood	$ 153.00
45050	MDMA, Blood	$ 140.00
45050FL	MDMA, Fluid	$ 235.00
45050T	MDMA, Tissue	$ 245.00
45050V	MDMA, Vitreous	$ 235.00
40444	Melatonin, Blood	$ 333.00
40450	Meperidine, Blood	$ 140.00
40450FL	Meperidine, Fluid	$ 235.00
40450T	Meperidine, Tissue	$ 245.00
40450V	Meperidine, Vitreous	$ 235.00
48345	Metals/Metaloids Acute Poisoning Panel, Blood	$ 491.00
40080	Metaxalone, Blood	$ 175.00
40080FL	Metaxalone, Fluid	$ 275.00
40080T	Metaxalone, Tissue	$ 285.00
40080V	Metaxalone, Vitreous	$ 275.00
40470	Methadone and Metabolite, Blood	$ 175.00
40470FL	Methadone and Metabolite, Fluid	$ 235.00
40470T	Methadone and Metabolite, Tissue	$ 245.00
40470V	Methadone and Metabolite, Vitreous	$ 235.00
45076	Methamphetamine, Blood	$ 140.00
45076FL	Methamphetamine, Fluid	$ 235.00
45076V	Methamphetamine, Vitreous	$ 235.00

Axis Order Code	Test Name	2023 List Price
45076T	Methamphetemine, Tissue	$ 245.00
45560	Methanol, Blood	$ 110.00
45560FL	Methanol, Fluid	$ 140.00
45560T	Methanol, Tissue	$ 155.00
45560V	Methanol, Vitreous	$ 140.00
45360	Methaqualone, Blood	$ 349.00
44085	Methemoglobin, Blood	$ 256.00
40050	Methocarbamol, Blood	$ 219.00
40050FL	Methocarbamol, Fluid	$ 412.00
40050V	Methocarbamol, Vitreous	$ 412.00
45060	Methylphenidate, Blood	$ 140.00
45060FL	Methylphenidate, Fluid	$ 235.00
45060T	Methylphenidate, Tissue	$ 245.00
45060V	Methylphenidate, Vitreous	$ 235.00
42020	Metoclopramide, Blood	$ 175.00
42020FL	Metoclopramide, Fluid	$ 235.00
42020T	Metoclopramide, Tissue	$ 245.00
42020V	Metoclopramide, Vitreous	$ 235.00
43170	Metoprolol, Blood	$ 175.00
43170FL	Metoprolol, Fluid	$ 275.00
43170T	Metoprolol, Tissue	$ 285.00
43170U	Metoprolol, Urine	$ 175.00
43170V	Metoprolol, Vitreous	$ 275.00
43180	Mexiletine, Blood	$ 651.00
40870	Midazolam, Blood	$ 140.00
40870FL	Midazolam, Fluid	$ 235.00
40870T	Midazolam, Tissue	$ 245.00
40870V	Midazolam, Vitreous	$ 235.00
41620	Mirtazapine, Blood	$ 175.00
41620FL	Mirtazapine, Fluid	$ 235.00
41620T	Mirtazapine, Tissue	$ 245.00
41620V	Mirtazapine, Vitreous	$ 235.00
42090	Mitragynine, Blood	$ 175.00
40480	Morphine, Blood	$ 140.00
40480FL	Morphine, Fluid	$ 235.00
40480T	Morphine, Tissue	$ 245.00
40480V	Morphine, Vitreous	$ 235.00
43190	Nadolol, Blood	$ 292.00
40650	Naloxone, Blood	$ 154.00
44120	Naltrexone, Blood	$ 510.00
40300	Naproxen, Blood	$ 140.00
40300FL	Naproxen, Fluid	$ 235.00

Axis Order Code	Test Name	2023 List Price
40300T	Naproxen, Tissue	$ 245.00
40300V	Naproxen, Vitreous	$ 235.00
45065	Nicotine/Cotinine, Blood	$ 206.00
45065FL	Nicotine/Cotinine, Fluid	$ 362.00
45065T	Nicotine/Cotinine, Tissue	$ 426.00
45065V	Nicotine/Cotinine, Vitreous	$ 362.00
43200	Nifedipine, Blood	$ 381.00
46210	Nitrazepam and Metabolite, Blood	$ 491.00
13710	Novel Emerging Substances, Blood	$ 325.00
13710U	Novel Emerging Substances, Urine	$ 325.00
13710V	Novel Emerging Substances, Vitreous	$ 325.00
42480	Olanzapine, Blood	$ 140.00
42480FL	Olanzapine, Fluid	$ 235.00
42480T	Olanzapine, Tissue	$ 245.00
42480V	Olanzapine, Vitreous	$ 235.00
40510	Opiates Panel 1, Blood	$ 175.00
40510FL	Opiates Panel 1, Fluid	$ 275.00
40510T	Opiates Panel 1, Tissue	$ 285.00
40510V	Opiates Panel 1, Vitreous	$ 275.00
40060	Orphenadrine, Blood	$ 260.00
41150	Oxcarbazepine, Blood	$ 175.00
41150FL	Oxcarbazepine, Fluid	$ 235.00
41150T	Oxcarbazepine, Tissue	$ 245.00
41150V	Oxcarbazepine, Vitreous	$ 235.00
40520	Oxycodone, Blood	$ 140.00
40520FL	Oxycodone, Fluid	$ 235.00
40520T	Oxycodone, Tissue	$ 245.00
40520V	Oxycodone, Vitreous	$ 235.00
40530	Oxymorphone, Blood	$ 140.00
40530FL	Oxymorphone, Fluid	$ 235.00
40530T	Oxymorphone, Tissue	$ 245.00
40530V	Oxymorphone, Vitreous	$ 235.00
43330	Papaverine, Blood	$ 371.00
41650	Paroxetine, Blood	$ 140.00
41650FL	Paroxetine, Fluid	$ 235.00
41650T	Paroxetine, Tissue	$ 245.00
41650V	Paroxetine, Vitreous	$ 235.00
40670	Pentazocine, Blood	$ 377.00
44630	Pentobarbital, Blood	$ 140.00
44630FL	Pentobarbital, Fluid	$ 235.00
44630T	Pentobarbital, Tissue	$ 245.00
44630V	Pentobarbital, Vitreous	$ 235.00

Axis Order Code	Test Name	2023 List Price
42490	Perphenazine, Blood	$ 238.00
41410	Phenacetin, Blood	$ 195.00
40570	Phencyclidine (PCP), Blood	$ 140.00
40570FL	Phencyclidine (PCP), Fluid	$ 235.00
40570T	Phencyclidine (PCP), Tissue	$ 245.00
40570V	Phencyclidine (PCP), Vitreous	$ 235.00
41160	Phenobarbital, Blood	$ 140.00
41160FL	Phenobarbital, Fluid	$ 235.00
41160T	Phenobarbital, Tissue	$ 245.00
41160V	Phenobarbital, Vitreous	$ 235.00
45080	Phentermine, Blood	$ 275.00
42300	Phenylpropanolamine, Blood	$ 226.00
41210	Phenytoin, Blood	$ 175.00
41210FL	Phenytoin, Fluid	$ 275.00
41210T	Phenytoin, Tissue	$ 285.00
41210U	Phenytoin, Urine	$ 175.00
41210V	Phenytoin, Vitreous	$ 275.00
43210	Pindolol, Blood	$ 314.00
40310	Piroxicam, Blood	$ 556.00
41300	Pregabalin, Blood	$ 140.00
41300FL	Pregabalin, Fluid	$ 235.00
41300T	Pregabalin, Tissue	$ 245.00
41300V	Pregabalin, Vitreous	$ 235.00
41220	Primidone, Blood	$ 211.00
41220FL	Primidone, Fluid	$ 403.00
41220V	Primidone, Vitreous	$ 403.00
42310	Promethazine, Blood	$ 140.00
42310FL	Promethazine, Fluid	$ 235.00
42310T	Promethazine, Tissue	$ 245.00
42310U	Promethazine, Urine	$ 140.00
42310V	Promethazine, Vitreous	$ 235.00
43230	Propafenone, Blood	$ 265.00
42150	Propofol, Blood	$ 294.00
40540	Propoxyphene, Blood	$ 243.00
43240	Propranolol, Blood	$ 140.00
43240FL	Propranolol, Fluid	$ 235.00
43240T	Propranolol, Tissue	$ 245.00
43240V	Propranolol, Vitreous	$ 235.00
45730	Propylene Glycol, Blood	$ 333.00
41660	Protriptyline, Blood	$ 239.00
42320	Pseudoephedrine, Blood	$ 140.00
42320FL	Pseudoephedrine, Fluid	$ 235.00

Axis Order Code	Test Name	2023 List Price
42320T	Pseudoephedrine, Tissue	$ 245.00
42320U	Pseudoephedrine, Urine	$ 140.00
42320V	Pseudoephedrine, Vitreous	$ 235.00
44240	Psilocybin	$ 493.00
13610	Psychoactive Substances Panel, Blood	$ 325.00
13610U	Psychoactive Substances Panel, Urine	$ 325.00
13610V	Psychoactive Substances Panel, Vitreous	$ 325.00
42500	Quetiapine, Blood	$ 140.00
42500FL	Quetiapine, Fluid	$ 235.00
42500T	Quetiapine, Tissue	$ 245.00
42500V	Quetiapine, Vitreous	$ 235.00
43250	Quinidine, Blood	$ 595.00
42570	Ramelteon, Blood	$ 205.00
42330	Ranitidine, Blood	$ 205.00
42330FL	Ranitidine, Fluid	$ 340.00
42330T	Ranitidine, Tissue	$ 360.00
42330U	Ranitidine, Urine	$ 205.00
42330V	Ranitidine, Vitreous	$ 340.00
9000	Return Fee	$ 70.00
42510	Risperidone and Metabolite, Blood	$ 227.00
41320	Ropinirole, Blood	$ 291.00
41235	Rufinamide, Blood	$ 255.00
40320	Salicylates, Blood	$ 292.00
40320FL	Salicylates, Fluid	$ 272.00
40320T	Salicylates, Tissue	$ 395.00
40320V	Salicylates, Vitreous	$ 272.00
44640	Secobarbital, Blood	$ 140.00
44640FL	Secobarbital, Fluid	$ 235.00
44640T	Secobarbital, Tissue	$ 245.00
44640V	Secobarbital, Vitreous	$ 235.00
11257	Sertraline and Metabolie, Urine	$ 140.00
41670	Sertraline and Metabolite, Blood	$ 140.00
41670FL	Sertraline and Metabolite, Fluid	$ 235.00
41670T	Sertraline and Metabolite, Tissue	$ 245.00
41670V	Sertraline and Metabolite, Vitreous	$ 235.00
70500	Sexual Assault Panel, Blood	$ 415.00
70055	Sexual Assault Panel, Urine	$ 375.00
44150	Sildenafil, Blood	$ 175.00
43270	Sotalol, Blood	$ 322.00
40190	Sufentanil, Blood	$ 381.00
42130	Synthetic Cannabinoids, Blood	$ 325.00
15880	Tadalafil, Blood	$ 175.00

Axis Order Code	Test Name	2023 List Price
40160	Tapentadol, Blood	$ 444.00
44650	Temazepam and Metabolite, Blood	$ 140.00
44650FL	Temazepam and Metabolite, Fluid	$ 235.00
44650T	Temazepam and Metabolite, Tissue	$ 245.00
44650V	Temazepam and Metabolite, Vitreous	$ 235.00
42520	Thioridazine, Blood	$ 247.00
43590	Thiosulfate, Serum/Plasma	$ 300.00
40070	Tizanidine, Blood	$ 528.00
41240	Topiramate, Blood	$ 175.00
41240FL	Topiramate, Fluid	$ 275.00
41240T	Topiramate, Tissue	$ 285.00
41240V	Topiramate, Vitreous	$ 275.00
20040	Trace Analysis - Drug Identification	$ 650.00
20000	Trace Analysis - Drug Quantitation	$ 1,600.00
40680	Tramadol and Metabolite, Blood	$ 140.00
40680FL	Tramadol and Metabolite, Fluid	$ 235.00
40680T	Tramadol and Metabolite, Tissue	$ 245.00
40680V	Tramadol and Metabolite, Vitreous	$ 235.00
41680	Trazodone, Blood	$ 140.00
41680FL	Trazodone, Fluid	$ 235.00
41680T	Trazodone, Tissue	$ 245.00
41680V	Trazodone, Vitreous	$ 235.00
40920	Triamterene, Blood	$ 752.00
44670	Triazolam, Blood	$ 219.00
44180	Trihexyphenidyl, Blood	$ 245.00
41690	Trimipramine, Blood	$ 140.00
41690FL	Trimipramine, Fluid	$ 235.00
41690T	Trimipramine, Tissue	$ 245.00
41690V	Trimipramine, Vitreous	$ 235.00
41280	Valproic Acid, Blood	$ 205.00
44155	Vardenafil, Blood	$ 175.00
41700	Venlafaxine, Blood	$ 175.00
41700FL	Venlafaxine, Fluid	$ 235.00
41700T	Venlafaxine, Tissue	$ 245.00
41700V	Venlafaxine, Vitreous	$ 235.00
43300	Verapamil, Blood	$ 140.00
43300FL	Verapamil, Fluid	$ 235.00
43300T	Verapamil, Tissue	$ 245.00
43300U	Verapamil, Urine	$ 140.00
43300V	Verapamil, Vitreous	$ 235.00
45650	Volatiles Panel, Blood	$ 110.00
45650FL	Volatiles Panel, Fluid	$ 140.00

Axis Order Code	Test Name	2023 List Price
45650T	Volatiles Panel, Tissue	$ 155.00
45650V	Volatiles Panel, Vitreous	$ 140.00
17010	Volatiles: Hydrocarbons and Oxygenated	$ 174.00
44190	Warfarin, Blood	$ 140.00
44190FL	Warfarin, Fluid	$ 235.00
44190T	Warfarin, Tissue	$ 245.00
44190V	Warfarin, Vitreous	$ 235.00
44690	Zaleplon, Blood	$ 310.00
42550	Ziprasidone, Blood	$ 210.00
44680	Zolpidem, Blood	$ 175.00
44680FL	Zolpidem, Fluid	$ 275.00
44680T	Zolpidem, Tissue	$ 285.00
44680V	Zolpidem, Vitreous	$ 275.00

FEE SCHEDULE FOR LITIGATION SUPPORT

Please direct questions to the Axis Forensic Toxicology Litigation Support Administrator at litigation@axisfortox.com or via phone at 317-759-4TOX.

Axis accepts check, credit card or ACH payment. Payments may be made on our website or mailed to:

Axis Forensic Toxicology
Attn: Litigation Support
P.O. Box 681513
Indianapolis, IN 46268-7513

ITEM 1: FEE SCHEDULE FOR LITIGATION DOCUMENT REQUESTS

Axis Forensic Toxicology requires a subpoena or letter of authorization requesting the tier packet which includes the Axis case number, physical address to send certified documents, and payment in full in order to release the documents.

The requisition form and final report are provided free of charge. Tier packets 2-4 are billed in hourly increments at an hourly rate of $300. Based on the specifics of the case, we will quote you a price for the requested documents.

TIER 1 - ANALYST LIST FEE: $100
Services Included
• A list of all analysts who performed each task for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results.

TIER 2 - LITIGATION PACKET FEE: approximately 2-3 hours, maximum $1200
Services Included
• A list of all analysts who performed each task for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results. • Copied chain-of-custody for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results. • Copied raw data for each assay in which the specimen was included. This includes the raw data for the specimen of interest only.

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TIER 3 - EXTENDED LITIGATION PACKET FEE: approximately 3-4 hours, maximum $1500
Services Included
• A list of all analysts who performed each task for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results. • Copied chain-of-custody for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results. • Copied raw data for each assay in which the specimen was included. This includes the raw data for the specimen of interest only. • Copied quality control data for each assay in which the specimen was included. Calibration data is not included unless otherwise specified by the client.

TIER 4 - FULL LITIGATION PACKET FEE: approximately 4-6 hours, maximum $2100
Services Included
• A list of all analysts who performed each task for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results. • Copied chain-of-custody for each assay in which the specimen was included. This includes all screening assays and confirmation assays resulting in both positive and negative results. • Copied raw data for each assay in which the specimen was included. This includes the raw data for the specimen of interest only. • Copied quality control data for each assay in which the specimen was included. Calibration data is not included unless otherwise specified by the client. • Copies of all AXIS Forensic Toxicology's Standard Operating Procedures outlining the methods utilized in the extraction, screening, confirmation, and data analysis for the specimen of interest.

FEE SCHEDULE FOR LITIGATION SUPPORT

ITEM 2: FEE SCHEDULE FOR AXIS TOXICOLOGIST TESTIMONY, DEPOSITION, CONSULTATION, AND EXPERT OPINION SERVICES**

SERVICE INCLUDED	FEE
Toxicologist testimony, deposition, or consultation via SKYPE, phone, or in person (per hour charge applies to all applicable travel and wait time)	$350 per hour/per person**
Travel expenses and all other costs and expenses	Charged at cost/per person
Retainer (payable at time of Engagement Agreement signing)	$1500
Multi-day Engagement	$2800 per day (maximum), plus expenses/per person
Cancellation Fee	$250 per person, plus expenses/per person

***Hourly fees include, but are not limited to, portal to portal, literature research, preparation time for testimony, deposition or affidavit. Expenses include, but are not limited to meals, transportation, hotel, car rental, etc.*
Once the retainer fee is received, research will begin for the case. All travel-related reservations will be finalized no earlier than seven (7) business days prior to the court date. If the court date is cancelled or postponed, or personnel are no longer needed after travel arrangements are completed, the cancellation fee will be imposed along with all non-refundable expenses and time incurred.

ITEM 3: FEE SCHEDULE FOR AXIS ANALYST FACT WITNESS

This fee schedule is applicable only to the laboratory analyst testimony services in criminal proceedings for testing performed by Axis when an Axis analyst receives a subpoena to testify regarding the chain of custody, testing methodology, and validity of the Axis test results ("Fact Witness Fee Schedule").This does not include any opinions or interpretation.

This fee schedule does not include Axis toxicologist testimony. Axis toxicology services and fees can be found under Item 2: FEE SCHEDULE FOR AXIS TOXICOLOGIST TESTIMONY, DEPOSITION, CONSULTATION, AND EXPERT OPINION SERVICES

SERVICE INCLUDED	FEE
Laboratory analyst deposition and/or trial testimony services (including preparation time) regarding the test procedure and results originally performed by Axis	$50 per hour/per person
Travel expenses and all other costs and expenses	Charged at cost/per person

PO Box 681513
Indianapolis, IN 46268
317.759.4TOX

December 6th, 2022

Axis Forensic Toxicology (Axis) is pleased to provide the following proposal package to the **Jackson County Missouri Medical Examiner's Office** in response to **RFP # 114-22: Forensic Toxicology Services.**

Axis - your industry-leading forensic toxicology partner, approaching your needs from every angle.

- Unmatched accuracy, accessibility, transparency and accountability
- Leader in designer drug testing and research & development
- Direct access and communication with our team of experts
- Forensics – the center of our work since 1990

Everything revolves around forensics.

At Axis, our mission is to contribute to an effective justice system that brings closure to people and communities by providing accurate, timely, and relevant toxicology results from our industry leading testing protocols, cost effective products, and access to subject matter experts.

Axis' "*whole case approach"* provides superior value, budgeting certainty, and highest quality outcomes. Axis charges a flat fee for screening and confirmation of common drug classes AND tests multiple matrices in every case to provide a more comprehensive understanding of the toxicology of the case, all under one bundled price to help provide certainty to your budget before you ever submit a single case. In addition to being cost effective and thorough, this approach minimizes the need for add-on testing and allows much faster results delivery. By pricing Axis' Comprehensive and Drugs of Abuse panels this way, clients have a known capitation compared to traditional fees for services and per specimen testing.

Axis receives cases daily from more than 700 clients in 45 states throughout the United States. We currently operate near 70% of our overall capacity, providing Axis more than enough additional capacity to complete work for the County in a timely manner. As a leading forensic toxicology lab with over 30 years of toxicology experience, processing casework in a timely and efficient manner is at the core of what we do. We currently provide final reports to clients within 10 days of receiving the case in-house. The County can expect timely processing similar to this result if they choose to use Axis as their toxicology lab partner.

If you have any questions concerning our submission and/or testing capabilities, we welcome the conversation. All questions may be directed to our Director of Operations and Product Management, Matt Zollman, at (317) 759-4869 or at mzollman@axisfortox.com. Additionally, we invite you to visit our website at www.axisfortox.com for more information about our laboratory, toxicologists, and test catalog.

We appreciate your consideration and look forward to continuing to serve you.

Regards,

Philip Roberts
CEO

AFFIDAVIT

ACKNOWLEDGEMENT OF ADDENDA

EXCEPTIONS

CONTRACTOR'S UTILIZATION PLAN

AFFIDAVIT

STATE OF Indiana)
) SS.
COUNTY OF Marion)

Denise Purdie Andrews of the city of Indianapolis
County of Marion State of Indiana being duly sworn on her or his oath, deposes and says,

1. That I am the Chief Operating Officer (Title of Affiant) of Axis Forensic Toxicology, Inc. (Name of Bidder) and have been authorized by said Bidder to make this Affidavit upon my best information and belief, after reasonable inquiry as to the representations herein.

2. No Officer, Agent or Employee of Jackson County, Missouri is financially interested directly or indirectly what Bidder is offering to sell to the County pursuant to this Invitation (though no representation is made regarding potential ownership of publicly traded stock of bidder).

3. If Bidder were awarded any contract, job, work or service for Jackson County, Missouri, no Officer, Agent or Employee of the County would be interested in or receive any benefit from the profit or emolument of such.

4. Either Bidder is duly listed and assessed on the tax rolls of Jackson County, Missouri and is not delinquent in the payment of any taxes due to the County or Bidder did not have on December 31, 2021, any property subject to taxation by the County and if bidder is duly listed and assessed on the tax rolls of Jackson County, Missouri, bidder agrees to permit an audit of its records, if requested by the Jackson County Director of Assessment, as they relate to the assessment of Business Personal Property.

5. Bidder has not participated in collusion or committed any act in restraint of trade, directly or indirectly, which bears upon anyone's response or lack of response to the Invitation.

6. Bidder certifies and warrants that Bidder or Bidder's firm/organization is not listed on the General Services Administration's Report of Debarred and/or Suspended Parties, or the State of Missouri and City of Kansas City, Missouri Debarment List.

7. Bidder certifies and affirms its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services.

8. Bidder certifies and affirms that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services.

Axis Forensic Toxicology (Name of Bidder)

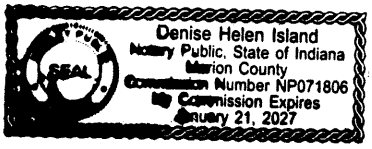
By: Denise Andrews (Signature of Affiant)

COO (Title of Affiant)

Subscribed and sworn to before me this 6th day of December, 2022

Denise Helen Island

NOTARY PUBLIC in and for the County of Marion (SEAL)



State of Indiana

My Commission Expires: January 21, 2027

ACKNOWLEDGMENT OF RECEIPT OF ADDENDA

The undersigned acknowledges receipt of Addenda through and including numbers 1 and that this Proposal is submitted in accordance with information, instructions, and stipulations set forth therein.

Denise A Andrews
Signature of Respondent

12/5/2022
Date

Axis Forensic Toxicology, Inc.
Company Name

P.O. Box 681513
Address

Indianapolis, IN 46268
City, State, and Zip

317-759-4869
Phone

EXHIBIT F

RESPONDENT'S EXCEPTIONS
TO
SCOPE OF SERVICES
OF
JACKSON COUNTY, MISSOURI REQUEST FOR PROPOSAL NO. 114-22

Respondent's attention is directed to Paragraph 4 of the General Conditions of this Request for Proposal **READ THIS PARAGRAPH CAREFULLY**.

The following exceptions to the Scope of Services of Request for Proposal No. 114-22 are requested by the undersigned Respondent: (Use additional pages as necessary.)

REFERENCE PARA # & PAGE #	**EXCEPTION REQUESTED**
None	

Name of Firm: Axis Forensic Toxicology

Signature of Bidder: Denise A Andrews

OFFICE OF THE COUNTY AUDITOR
COMPLIANCE REVIEW OFFICE
415 E 12TH STREET, 2ND FLOOR
KANSAS CITY, MISSOURI 64106

(816) 881-3302
FAX (816) 881-3340
CRO@JACKSONGOV.ORG
WWW.JACKSONGOV.ORG/AUDITOR

JACKSON COUNTY, MISSOURI
CONTRACTOR UTILIZATION PLAN

Bid/RFP/RFQ Number: 114-22
Bid/RFP/RFQ Title: Forensic Toxicology Services
Contracting Department: Medical Examiners' Office
Respondent: Axis Forensic Toxicology

I, Denise Purdie Andrews, of lawful age and upon my oath state as follows:

1. This Affidavit is made for the purpose of complying with the provisions of the MBE/WBE/VBE submittal requirements on the above Bid/RFP/RFQ and the MBE/WBE/VBE Program and is given on behalf of the Respondent listed above. It sets out the Respondent's plan to utilize MBE and/or WBE and/or VBE prime and subcontractors on the awarded contract.

   The goals set by Jackson County, Missouri are:

   0 % MBE 0 % WBE 0 % VBE

2. **Bidder stipulates that it will utilize a minimum of the following percentages of MBE/WBE/VBE participation in the above bid:**

   0 % MBE 0 % WBE 0 % VBE

3. The following are the MBE/WBE/VBE Contractors to be utilized on the above-named solicitation. **Respondent maintains that it either has a formal contract or a conditional contract contingent upon award.**

Please note:

a. If Bidder is a certified MBE, WBE, or VBE firm, it may list itself in the appropriate area below.

b. No contractor may be listed under multiple categories below regardless of certifications.

*****INTERNAL USE ONLY*****

CUP RECEIVED: _____ **CUP APPROVED:** _____

GFE RECEIVED: _____ **GFE APPROVED:** _____

CUP REVISED: _____ **REVISION APROVED:** _____

APPROVED GOALS: _____ **MBE** _____ **WBE** _____ **VBE**

RES/ORD: _____ **AMT AWARDED:** _____

NOTES:

MBE SUBCONTRACTORS

Add Additional Pages as Necessary

	Description	Bidder Response	
A.	MBE Firm:		**INTERNAL USE ONLY**
	Address line 1:		
	Address line 2-include County:		**Certifying Agency:**
	Telephone Number:		**_____KCMO**
	President/Owner:		**_____State of MO**
	Email Address:		**Approved: Y N**
	Certifying Agency		
	Expiration Date of Certification:		**Sub A Contract Value:**
	Scopes of Work Utilized:		**$**
	Percentage of Contract Awarded:		

B.	MBE Firm:		**INTERNAL USE ONLY**
	Address line 1:		
	Address line 2-include County:		**Certifying Agency:**
	Telephone Number:		**_____KCMO**
	President/Owner:		**_____State of MO**
	Email Address:		**Approved: Y N**
	Certifying Agency		
	Expiration Date of Certification:		**Sub B Contract Value:**
	Scopes of Work Utilized:		**$**
	Percentage of Contract Awarded:		

C.	MBE Firm:		**INTERNAL USE ONLY**
	Address line 1:		
	Address line 2-include County:		**Certifying Agency:**
	Telephone Number:		**_____KCMO**
	President/Owner:		**_____State of MO**
	Email Address:		**Approved: Y N**
	Certifying Agency		
	Expiration Date of Certification:		**Sub C Contract Value:**
	Scopes of Work Utilized:		**$**
	Percentage of Contract Awarded:		
		TOTAL MBE VALUE	**$**

WBE SUBCONTRACTORS

Add Additional Pages as Necessary

	Description	Bidder Response	
A.	WBE Firm:		INTERNAL USE ONLY
	Address line 1:		
	Address line 2-include County:		Certifying Agency: _____KCMO _____State of MO
	Telephone Number:		
	President/Owner:		Approved: Y N
	Email Address:		
	Certifying Agency		
	Expiration Date of Certification:		Sub A Contract Value:
	Scopes of Work Utilized:		$
	Percentage of Contract Awarded:		

B.	WBE Firm:		INTERNAL USE ONLY
	Address line 1:		
	Address line 2-include County:		Certifying Agency: _____KCMO _____State of MO
	Telephone Number:		
	President/Owner:		Approved: Y N
	Email Address:		
	Certifying Agency		
	Expiration Date of Certification:		Sub B Contract Value:
	Scopes of Work Utilized:		$
	Percentage of Contract Awarded:		

C.	WBE Firm:		INTERNAL USE ONLY
	Address line 1:		
	Address line 2-include County:		Certifying Agency: _____KCMO _____State of MO
	Telephone Number:		
	President/Owner:		Approved: Y N
	Email Address:		
	Certifying Agency		
	Expiration Date of Certification:		Sub C Contract Value:
	Scopes of Work Utilized:		$
	Percentage of Contract Awarded:		
		TOTAL WBE VALUE	$

VBE SUBCONTRACTORS

Add Additional Pages as Necessary

	Description	Bidder Response	
A.	VBE Firm:		INTERNAL USE ONLY Certifying Agency: _____KCMO _____State of MO Approved: Y N Sub A Contract Value: $
	Address line 1:		
	Address line 2-include County:		
	Telephone Number:		
	President/Owner:		
	Email Address:		
	Certifying Agency		
	Expiration Date of Certification:		
	Scopes of Work Utilized:		
	Percentage of Contract Awarded:		

B.	VBE Firm:		INTERNAL USE ONLY Certifying Agency: _____KCMO _____State of MO Approved: Y N Sub B Contract Value: $
	Address line 1:		
	Address line 2-include County:		
	Telephone Number:		
	President/Owner:		
	Email Address:		
	Certifying Agency		
	Expiration Date of Certification:		
	Scopes of Work Utilized:		
	Percentage of Contract Awarded:		

C.	VBE Firm:		INTERNAL USE ONLY Certifying Agency: _____KCMO _____State of MO Approved: Y N Sub B Contract Value: $
	Address line 1:		
	Address line 2-include County:		
	Telephone Number:		
	President/Owner:		
	Email Address:		
	Certifying Agency		
	Expiration Date of Certification:		
	Scopes of Work Utilized:		
	Percentage of Contract Awarded:		
		TOTAL VBE VALUE	$

ACKNOWLEDGMENT

Respondent acknowledges that it is responsible for considering the effect that any change order and/or amendments changing the total contract amount may have on its ability to meet or exceed the subcontractor participation goals.

Good Faith Effort:
Respondent further acknowledges that it is responsible for submitting a **Good Faith Effort Form** if it will be unable to meet the participation goals. A **Good Faith Effort Form** documents the efforts a respondent puts forth to achieve the MBE and/or WBE and/or VBE goals on a project. **Simply stating that goals cannot be met is not considered sufficient.**

Contractor Modification Form:
If, at any point during the life of the awarded contract, the contractor needs to substitute an approved subcontractor a **Contractor Modification Form** must be submitted to the Compliance Review Office.

Any Good Faith Effort or Contractor Modification Form must be approved by the Compliance Review Office.

*****Contact the Compliance Review Office for assistance or to request forms.*****

I hereby certify that I am authorized to make this Affidavit on behalf of the Respondent named below and who shall abide by the terms set forth herein. I acknowledge that the assigned values determined by this CUP shall be enforceable under the contract terms and conditions.

Respondent Primary Contact: Denise Purdie Andrews Denise A Andrews

Title: COO **Email:** dpandrews@axisfortox.com

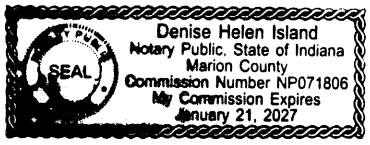
Date: 12/5/2022 **Phone:** 317-759-4869

Subscribed and sworn to before me this 6th day of December, 2022

My Commission Expires: January 21, 2027

Denise Helen Island

Notary Public
(Attach corporate seal if applicable)



For questions on this form please contact:

Compliance Review Office
816-881-3302
CRO@jacksongov.org

Jackson County, Missouri
Medical Examiner's Office

In Response to Request for:

FORENSIC TOXICOLOGY SERVICES

RFP 114-22

December 8, 2022

PRESENTED BY:

AXIS FORENSIC TOXICOLOGY

www.axisfortox.com

Phone:(317) 759–4TOX

TABLE OF CONTENTS

Moved to separate Pricing document

TECHNICAL PROPOSAL (5.1.8)

Axis Forensic Toxicology (Axis) is pleased to provide the following Proposal to the **Jackson County Medical Examiner Office** (JCMEO) in response to the request for **Forensic Toxicology Services**.

At Axis, our mission is to contribute to an effective justice system that brings closure to people and communities by providing accurate, timely, and relevant toxicology results from our industry leading testing protocols, cost effective products, and access to subject matter experts. That mission starts with preparing you to submit accurate and complete testing requests, so that we can deliver your results as quickly and completely as possible.

Axis is proud to have served the County since 2018 and of the relationship that has been established with the JCMEO. Axis is confident our services and products will meet and/or exceed the needs and requirements of the JCMEO. Axis has worked closely with the JCMEO staff to customize and fine tune its products and processes to best serve the County.

Axis understands the importance of providing quality work in a timely and cost-effective manner. As a leading forensic toxicology lab with over 30 years of toxicology experience, processing casework in a timely and efficient manner is at the core of what we do. We routinely provide final reports to clients within 10 business days of receiving the case in-house. The County can expect timely processing if continue with Axis as their toxicology lab partner.

Axis Forensic Toxicology receives cases daily from more than 700 clients throughout The United States. We operated near 70% of our overall capacity while previously serving the County, and continue to maintain more than enough additional capacity to complete work for the County in a timely manner.

SPECIFICATIONS OF WORK TO BE PERFORMED (5.1.6 AND 5.1.7)

Axis Forensic Toxicology provides clients with a wide breadth of testing options and services that meet the needs of most postmortem toxicology cases. Axis toxicology panels provide a whole case approach that gives the client the ability to have multiple specimens from one case tested, thereby providing the client with the opportunity to review results from blood, urine, and (as relevant) vitreous specimens for one cost. This model is in contrast to the typical charge of a fee per each individual tested specimen in a case that many other labs provide.

In addition to toxicology testing, Axis' standard services provide additional benefits at no additional cost to the client. These services include: free specimen collection supplies; free shipping materials; free case consultation and interpretation by a toxicologist (does not include expert witness or testimony); free case management portal access; free storage of remaining specimens in a case for one (1 year) from the last date of testing.

OVERVIEW OF SERVICES

Axis Forensic Toxicology, Inc. (Axis) provides forensic toxicology testing and litigation services to medical examiners, coroners, reference laboratories, state crime laboratories, federal, state, and local law-enforcement agencies, government agencies, sexual assault centers, attorneys, courts of law and correctional centers.

Axis provides a comprehensive and systematic approach to the analysis of biological fluids, tissues and drug dosage forms on behalf of our clients throughout the United States. As part of the forensic program, Axis follows strict chain-of-custody and confidentiality guidelines as well as providing complete professional consultation and expert witness testimony. Axis' commitment in forensic toxicology is to determine the potential role of drugs and chemicals in postmortem and antemortem cases.

The toxicology test services offered by Axis were developed through our team of experts and consultation with recognized authorities within the forensic toxicology community. These tests are grouped into:

1. Panels which provide an economic means of screening for the possible presence of specific Drugs or Drug Classes (i.e., Barbiturates, Opiates, etc.) and then confirming the quantitative/qualitative presence or absence of the specific drug(s)/chemical(s) using a second confirmatory test.
2. Directed Tests, which provide for quantitative analysis of the specimen for specific drug(s).

As a result of our on-going research efforts, new assays and panels are constantly validated and introduced into laboratory services. If you require analysis for a specific drug or chemical or a Panel, please contact the Axis' Lab Client Support group for further assistance at labclientsupport@axisfortox.com. Axis will notify the JCMEO regarding changes made to the panels or new product offerings.

Axis' primary toxicology panels are setup to provide a "whole case approach" to testing. When the Comprehensive Panel with Analyte Assurance™ or Drugs of Abuse Panel is ordered and a blood, urine, and/or vitreous sample are submitted with a case, the total price of the panel will include corroborative testing between matrices (see Exhibit H for a detailed description of the features of Axis's panels).

All services will be provided at Axis' laboratory, which is located at 5780 West 71st Street, Indianapolis, IN 46278. From this location, Axis serves clients throughout the United States. As the Crossroads of America, Indianapolis is within easy shipping and travel distance to the JCMEO and most areas of the United States.

Axis does more than 99% of its own testing, but will use reference laboratories when it best serves the case. Axis uses only accredited laboratories, consolidates the results onto a single report, cites the performing laboratory, and handles all billing and administration. (5.1.8.11)

TESTING AND SERVICES OFFERED

The JCMEO has requested the following testing: detection and quantitation of substances including but not limited to: ethanol, methanol, ethylene glycol, amphetamines, benzodiazepines, barbiturates, cocaine, and metabolites (including cocaethylene), fentanyl, opiates (including morphine, hydromorphone, methadone, oxymorphone and heroin), gabapentin, carbon monoxide, phencyclidine, propoxyphene, salicylates, acetaminophen, THC and metabolite, cyanide, arsenic, inhalants, ibuprofen and common therapeutic drugs. Axis can provide analysis of the substances requested.

To meet these needs, Axis has created a standard Drugs of Abuse Panel and the Comprehensive Panel with Analyte Assurance™. Both panels provide the requested results with a "Whole Case Approach". When the Comprehensive Panel with Analyte Assurance™ (Order Code 70510) or DOA Panel (Order Code 70530) is ordered and a blood, urine, and vitreous sample are submitted with a case, the total price of the panel will include testing of the blood, urine and vitreous alcohols, if warranted.

In addition to the standard toxicology panels offered, Axis provides additional testing options that may be ordered on a case-by-case basis, depending on the needs of the County. Axis is an industry leader in providing results for specialty substance testing including (but not limited to) the Synthetic Cannabinoids Panel, Psychoactive Substances Panel, Designer Opioids Panel, and Novel Emerging Compounds Panel. Please see Exhibit H for a complete list of tests available.

Please visit our test catalog at www.axisfortox.com for the most up-to-date listing of panel scopes and test offerings.

NON-ROUTINE ANALYSIS

Axis can provide non-routine and trace analysis testing for non-biological specimens such as syringes, residues, tablets, pills, capsules, liquids, or other circumstantial evidence found at a crime scene. See Exhibit H for further information on these services.

NON-TOXICOLOGICAL ANALYSIS

The JCMEO has requested chemical analysis of vitreous fluid to quantitate electrolytes and other substances including potassium, sodium, urea nitrogen, creatinine, and glucose. Axis can provide these results to the County where needed.

Axis maintains reference laboratory arrangements with accredited laboratories that can perform non-toxicological analyses such as bacterial and viral cultures and DNA. This arrangement provides for a single collection and shipment process for coroners and medical examiners.

LABORATORY TECHNIQUE

Axis determines the scope of its toxicology panels by performing an annual/biannual review of client needs and new and emergent drugs found in the population. This review ensures our panels meet the needs of our clients while providing a cost-effective approach to keeping our panels accurate and relevant. See Exhibit K for our policy on the Surveillance of Forensic Testing Capabilities.

Occasionally, the County may need testing for a substance that falls outside the scope of Axis's standard panels. Axis has the resources and capabilities to meet the needs of the County in these circumstances. Axis' chemists and toxicologists have honed their expertise over many years of non-routine testing and Axis's instrumentation gives it access to a vast library of compounds. Axis is proud of the work it has done to help its clients with unusual or unexpected cases and materials.

SPECIMEN COLLECTION, SUPPLIES, AND PICK-UP SERVICE (5.1.8.6, 5.1.8.7, 5.1.8.16)

Axis provides collection kits that include the materials listed below in addition to the requisition form (Exhibit I), specimen bag, security seals, specimen volume instruction sheet, and blood manifest form (Exhibit I). Shipping materials such as FedEx PrePaid return labels and FedEx Overpak bags are also provided at no charge (see included samples of the mailing supplies). Scheduled pickup by FedEx Overnight service is available and recommended. Using the Axis supplied shipping labels will allow the County to track the status of the shipment through receipt. Please refer to the Client Guide in Exhibit L for more details including case submission instructions using these supplies.

Standard kit contents:

Container(s)	Preservative	Matrix	Volume Needed
30 mL bottle	Sodium fluoride EDTA	Blood (Peripheral Site)	20 mL
Gray-top tube	Sodium fluoride potassium oxalate	Blood (Central Site)	5 mL (5 mL/tube)
Clear-top tube	No preservative	Vitreous fluid	2-3 mL
Yellow-top tube	No preservative	Urine	5-8 mL
60 mL screw-top cup	No preservative	Tissue	10 grams

Axis also provides the County with the syringes and needles appropriate to collect and fill the above-containers. The supplies were identified in collaboration with the County.

Axis understands that not all toxicology case needs are the same and the supplies needed may vary depending on the type of test being requested and sometimes specialty supplies are required. For that reason, Axis will work with the County to ensure the supplies shipped will meet the County's needs.

Axis will ensure that all coroners and Medical Examiner offices have the supplies needed to begin submission in a timely manner.

ORDERING PROCESS (5.1.8.5)

Prior to testing, Axis clients are required to complete and submit a written forensic requisition form (Exhibit I). The requisition form requires the following information:

- Account Information
  - Full name and account number
  - Mailing address of agency
- Chain of Custody Information
  - Signatures are required to maintain Axis' Chain of Custody
    - If the Chain of Custody is not filled out completely, Axis is not authorized to proceed with testing
  - A signature is required of the person by whom the specimens were obtained or sent to the laboratory, investigator, pathologist and submitting official
- Test Request Information
  - Type of test(s) being requested
- Subject Information
  - Subject's first and last name
  - Date of death
  - Agency case number
  - Sex
  - Age
- Specimens Submitted
  - Type of specimen – whether it is to be tested
  - Date the specimen was collected
  - A barcode sticker is to be affixed to each specimen container
  - Volume provided
- Brief Case History (optional)

In addition to the preprinted, triplicate requisition form required by the RFP (standard for Axis), Axis also offers a fillable PDF requisition. Axis may also be able to accept orders generated from death investigation software if it maintains and prints the critical information for submission.

RECEIVING, ACCESSIONING, AND TEMPORARY STORAGE OF SPECIMENS

Axis provides legal chain-of-custody procedures that comply with state and federal legislation and case law. Laboratory results from Axis have been accepted in federal, state, military and local courts on behalf of prosecutors in more than forty-five (45) states including the County, the U.S. federal courts, the U.S. Navy, and the U.S. Alcohol, Tobacco, and Firearms Agency.

Specimens are received into the laboratory with documentation of the following:

- Date, time, and manner of delivery
- "Received By" information
- Condition of package/container (e.g. intact and sealed, damaged, etc.)
- Condition of sample (i.e. turbid, clotted, etc.)

Following receipt, the specimens are individually accessioned with documentation of the following:

- Date and time of accessioning
- Accessioner's name
- Identification of each specimen and matching with client identification of specimen
- Assignment of accession number (unique to the case and specimen)

If there are questions about the information provided on the requisition form, an Affidavit will be issued to clarify the information/instructions. See Exhibit I for a sample Affidavit.

CHAIN OF CUSTODY (5.1.8.8)

Axis enforces strict security measures to guarantee the integrity of each sample.

- Lab access is limited to authorized personnel only and samples are stored in secured cooler/freezer locations.
- Each specimen and aliquot (a small portion to be used in a specific analytical procedure) is bar-coded to ensure traceability throughout the testing process. Containers are labeled prior to the transfer of specimen and only one container is opened at a time.
- Once accessioned, the specimens are maintained in a secure refrigerated temporary storage location until final testing is completed.
- Based on the testing required, specimen analysis is batched in the LIMS and a physical chain of custody document is generated which is used to record the process, lot numbers, and personnel associated with that batch.
- At each phase of processing of the batch, the technician, analyst or certifier will sign to acknowledge their work. These documents are maintained as scientific work product according to record retention policies.
- Once the results of the batch are entered into the LIMS, they are also electronically verified in addition to the paper batch record, and the audit of this activity is maintained in LIMS.
- After all chemical analysis is completed, the results are presented to one of Axis' credentialed toxicologists, who will review the end to end processing of the case and determine if it is acceptable to be released or returned for further analysis. When this process is successfully completed in the LIMS, the final report is released to the client and includes the signature of the releasing toxicologist.
- Any remaining specimen will be placed in long-term frozen storage for the agreed retention period.

For the full details of Axis' thorough Chain of Custody procedures, see the attached Specimen Handling Procedure in Exhibit K.

METHODS

Axis uses a variety of high-tech instrumentation and analysis methods such as gas chromatography (GC), mass spectrometry (MS), gas chromatography/mass spectrometry (GC/MS), liquid chromatography/mass spectrometry (LC/MS), liquid chromatography-mass spectrometry/mass spectrometry (LC/MS/MS), ultra-performance liquid chromatography-mass spectrometry/mass spectrometry (UPLC/MS/MS), and ultra-performance liquid chromatography-Quadrapole Time of Flight mass spectrometry/mass spectrometry (LC/QTOF/MS).

Axis has more than 50 laboratory-developed analytical methods. Each method is carefully developed through research and experimentation by our highly qualified Analytical Chemists, and then validated to ensure that qualitative and quantitative results can be reliably obtained for the analytes of interest and the matrices submitted. Any time a new method is developed, or an existing method improved, a thorough production onboarding process is conducted, consisting of verification that the method is executable within the production laboratory, meets client needs, and performs on an ongoing basis, followed by training of personnel, and a scheduled implementation date once the foregoing has been successfully completed.

Axis does not typically distinguish between the Limits of Detection (LOD) and the Limits of Quantification (LOQ) because we strive to validate quantitatively to the lowest level that we can detect, although there are exceptions where an analyte would be reported present below the LOQ.

QUALITY ASSURANCE

Quality is an integral part of everything we do at Axis. All work is conducted in compliance with controlled Standard Operating Procedures. These SOPs are reviewed at least annual by the Laboratory Director and any time

an update is requested by a member of Laboratory Management. Changes will be implemented after appropriate staff training has been conducted.

Axis processes specimens in batches, for which strict chain of custody is maintained. Axis follows laboratory best practices in its use of Quality Control specimens to ensure that each batch and each specimen within the batch meet or exceed the quality measures established during validation. Each batch is calibrated as a unique batch and controls are run with each calibrated batch to verify that the calibration meets validated criteria. To the degree that a specimen or a batch does not meet criteria, testing is repeated until confidence in the result is established.

Axis understands that the nature of postmortem work means that the County sometimes must submit specimens in less than ideal conditions. Axis will make its best effort to return a result whenever possible, including re-running a specimen or switching to an alternate specimen where one is available. If an analyte can be detected, but a valid quantitative value not obtained, it may be reported as Present. In extreme cases, if no valid result can be obtained, the analyte would be reported as Unsuitable for analysis. If insufficient specimen volume is available to complete testing, it will be reported as Quantity Not Sufficient.

QUALITY CONTROL (5.1.8.15)

The mission of Quality Control is to provide value through its ability to supply and monitor the standards, controls (QCs), and reagents required for the analysis of client samples at Axis Forensic Toxicology. The QC Team is committed to providing these materials in an accurate, precise and timely fashion. Through monitoring QC trends, problem solving assay failures and participation in proficiency testing programs, the department supports Axis's mission – providing accurate, timely, and relevant toxicology results.

Quality control procedures are designed to monitor analytical performance and alert analysts to problems that might limit the usefulness of a test result for its intended purpose. Quality control ensures that the analytical performance characteristics of the test are appropriate for the decisions that need to be made.

The performance of analytical methods is monitored by routine analysis of materials with established values (quality controls or QCs) and statistical analysis of the QC data. The statistics are used to make judgments about the quality of analytical results:

- whether system correction is necessary
- whether data should be accepted or rejected and retested
- estimating performance parameters which can be compared to the analytical and medical goals.

Good quality control materials should emulate actual specimens when possible. The quality control materials are typically prepared in human urine, animal sera, or a negative blood solution containing human red blood cells. Other matrices include synthetic urine and human whole blood. The appropriate matrix is spiked with analytes at levels within the linear range or around critical decision points as required by some accrediting bodies. It is important that controls be compatible with the analytical method and reliably indicate acceptable or unacceptable performance.

The acceptance of quality control values is determined based on comparison to target values or control ranges. When obtained quality control values fall within a set range, the method is considered to be operating properly, and results are assumed to be valid. When obtained quality control values fall outside a set range, the subject results may be invalid, and therefore repeated.

Measuring equipment is used daily in a variety of tasks that require both exact and non-exact measurements of volume transfer. Precise measurements are made using micropipettes, volumetric flasks, and other calibrated equipment. Imprecise measurements are made using graduated cylinders or other equipment where required volume is not needed to be exact. Typically, precision is required for tasks where specific volumes measured in microliters (µL) are required. Imprecise measurements are typically acceptable in instances where volumes measured in liters (L) are required. In instances where imprecise but small volumes are required, checklists should

be notated as being approximate volumes. Checklists and SOPs should always be referenced in situations where measuring is required to determine the most appropriate equipment for the volume and task.

QC MATERIALS (CONTROLS, CALIBRATORS, STANDARD DILUTIONS AND INTERNAL STANDARDS)

Whether purchased or prepared, high quality QC materials must be obtained. Each specific analytical procedure at Axis outlines the type of QC material used in the assay. When QC material is purchased, a certificate of analysis is requested from the vendor. These certificates of analysis are kept for reference in Axis Forensic Toxicology's electronic library. If any material requires a specific purity, that will be indicated on a specific analytical method preparation checklist. Acceptance criteria may vary for each QC material. Each material placed into production by Quality Control personnel will have corresponding paperwork, stored with all other assay checklists and forms, which must be signed off on as approved for service.

Records of QC material preparation must be maintained and readily retrievable. For traceability purposes, the date of preparation, the expiration date, and the identification of the individual preparing the material should be documented. In addition to the information required during original preparation, each aliquot of QC material should be labeled with the preparation date, the expiration date, the concentration, the storage conditions and the initials of the individual who prepared the material providing space is not limited. At minimum, traceability to original documentation is required to access the above-mentioned information.

REAGENTS

Reagent preparation will be performed according to the appropriate Axis analytical method checklist or form, and records of preparation will be documented. If the checklist or form is deviated from, the deviation from preparation will be documented directly on the preparation paperwork. In-house prepared reagents or solutions will be labeled with the reagent name (including concentration or amount of active ingredient if applicable), date of preparation, date of expiration, lot number, proper storage conditions, and initials of the preparer. The label information will be traceable to the reagent preparation and verification records. Expired reagents will be discarded or removed from the laboratory properly so as to be inaccessible to analysts.

CONTROLS

Controls are used to support the information obtained in the original method validation and to assure proper calibration is present prior to the analysis of data for an assay. To ensure the accuracy of the control material, new lots of QCs will be verified before being placed into routine use. These new lots of QCs include materials prepared by QC personnel and materials from outside vendors received into the laboratory. Testing methods and acceptance parameters vary.

CALIBRATORS AND STANDARD DILUTIONS

Samples are quantified by comparison to the calibrator(s). For many analytical methods, a working standard is used to prepare a working curve in lieu of a calibrator. Accuracy of these materials is essential and will be verified before being placed into routine use. Testing methods and acceptance parameters vary.

REAGENTS AND INTERNAL STANDARDS

Buffers with a specific pH are required by some analytical methods to maximize the extraction of the desired analytes from the matrix. As such, these materials will be verified for efficacy before being placed into routine use. Testing methods and acceptance parameters vary.

Internal standards are used as a reference to confirm proper extraction and are generally used in the quantitation of the analyte of interest. With this application in mind, internal standards tend to be compounds of similar

structure and characteristic (e.g. deuterated drug standard) to the analyte of interest. New lots of internal standard will be verified before being placed into routine use. Testing methods and acceptance parameters vary.

DATA ANALYSIS

On a monthly basis, QC plotted graphs for analytical assays are printed and reviewed for trends or shifts. A group, consisting of the Director of Lab Operations and QC personnel, reviews the monthly data and decides the appropriate action to take, if any. This information is then reviewed, documented in a monthly review memo, and approved by the Lab Director. All data used in the analysis of these charts is logged in addition to the signed memo.

PROFICIENCY TESTING

An important aspect of laboratory quality assurance is proficiency testing, which is also an element of our accreditation processes. Proficiency testing, sometimes called interlaboratory comparison, provides an additional quality check by benchmarking performance on blind specimen submissions across multiple laboratories. Axis participates in several Proficiency Testing surveys through the College of American Pathologists that are required by ABFT, plus several that are optional but relevant to our work.

TURNAROUND TIME (5.1.8.9 AND 5.1.8.10)

Axis understands that the community and families in the JCMEO expect quick response regarding their case and we strive to be your partner in timely service as well as quality. Specimens are processed upon receipt of complete submissions and test results are reported to the client as soon as possible. Turnaround time varies depending on the nature of the request and the amount of time required to perform testing. Typical turnaround time for cases (blood, urine, and vitreous fluid) is within 10 business days of receiving the case in-house. The County can expect timely processing if they use Axis as their toxicology lab partner. As your partner, we will advise of unexpected delays and provide any requested turnaround time reports in a timely manner.

Axis understands that sometimes certain cases require expediting. Axis will work with the JCMEO to move those cases to the front of the queue without compromising quality.

SAFETY

Axis is committed to the safety of its employees and community. All employees participate in initial and annual safety training programs. Axis uses best industry safety practices, including Personal Protective Equipment, safety cabinets and fume hoods, and procedures to prevent repetitive use injuries. Axis adheres to CDC guidelines regarding mitigation of the Covid-19 pandemic and will comply with any applicable requirements for health and safety.

QUALIFICATIONS (5.1.3)

COMPANY CERTIFICATIONS AND ACCREDITATIONS (5.1.8.1)

Axis Forensic Toxicology, Inc., was incorporated in Indiana on June 17, 2016 when two executive members from the American Institute of Toxicology, Inc. (AIT Laboratories) purchased the AIT Laboratories' forensic business. The acquisition of AIT Laboratories' forensic business has brought Axis over 25 years of forensic toxicology quality, innovation, and service to Axis.

Axis is accredited by ANAB to ISO/IEC 17025:2017 and the American Board of Forensic Toxicology (ABFT) in the field of Forensic Toxicology (Exhibit A), accredited by the College of American Pathologists (CAP) (Exhibit B), and CLIA certified (Exhibit C). Axis follows Society of Forensic Toxicologists (SOFT) guidelines.

Axis maintains a Drug Enforcement Administration license due to handling very limited quantities of controlled substance for use as standards in analysis and while conducting non-biological trace analysis. A copy of that license is available if it is desired.

This combination of accreditation and certification standards ensure each forensic sample is processed and handled appropriately, maintains a strict chain of custody, and that test methods have been validated appropriately to ensure optimal quality test results that may be upheld in a court of law.

PROFESSIONAL REFERENCES (5.1.4 AND 5.1.5)

Name	Dr. Diane Peterson, MD, Johnson County KS Chief Medical Examiner
Agency	Dept of Health and Environment, Kansas
Address	11875 S Sunset, Suite 300 Olathe, KS 66061
Phone	913-477-8419 (direct)
Email Address	diane.peterson@jocogov.org
Alternate Contact	Dr. Kim Samano, PhD, Chief Toxicologist
	913-826-3535 (direct)
	kim.samano@jocogov.org
Service	Postmortem forensic toxicology testing services provided to office since August 2020 and to medical examiner since September 2018.
Description of Client	The MEO responds to death scenes in all nineteen cities (Olathe, Overland Park, Shawnee, Lenexa, Leawood, Mission, Gardner, Prairie Village, Merriam, Roeland Park, De Soto, Mission Hills, Spring Hill, Fairway, Lake Quivira, Edgerton, Westwood, Mission Woods, and Westwood Hills) in addition to all of unincorporated Johnson County comprising an overall geographical area of approximately 480 square miles. (For more: https://www.jocogov.org/department/medical-examiner)

Name	Wendolyn Sneed, MD, District 15 Medical Examiner
Agency	Palm Beach County Medical Examiner's Office
Address	3126 Gun Club Road, West Palm Beach, FL 33406
Phone	561-688-4575 (main), 786-423-1050 (cell)
Email Address	WSneed@pbcgov.org
Alternate Contact	Paul Petrino, Director of Operations
	561-688-4595 (direct), 561-308-2902 (cell)
	PPetrino@pbcgov.org
Service	Postmortem forensic toxicology testing services provided to office since July 2017.
Description of Client	According to the Florida Legislature Office of Economic and Demographic Research1, Palm Beach County is Florida's 4th most populous county, with 6.8% of Florida's population. In addition to its' year round and seasonal residents, Palm beach County has several million visitors per year. If any person, resident or visitor, dies within Palm Beach County, and the circumstances of the death

	fulfill the criteria defined by Florida Statute 406.11, they will be referred to the Palm Beach County Medical Examiner Office for investigation of the circumstances. In 2020, 5,416 deaths were reported to the PBCMEO. This included 1,834 cases investigated and determined to NOT fulfill the criteria of F.S. 406.11. These are called non-medical examiner (non-ME) cases. The PBCMEO reviewed the death certificates of 9,015 decedents who were to be cremated to determine if any fulfilled the criteria of F.S. 406.11 and thus become a medical examiner (ME) case. Of those 9,015 cremation reviews in 2020, 114 (1.2%) became ME cases because they fulfilled the criteria of F.S. 406.11. The total number of ME cases in 2020 was 3,582. The 2020 annual report concentrates on the 3,582 Medical Examiner (ME) cases.

Name	Mandy Combest on behalf of William Ralston, MD
Agency	Commonwealth of Kentucky Office of the Chief Medical Examiner
Address	Bingham Building 1st Floor, 10511 LaGrange Rd. Louisville, KY 40233
Phone	(502) 489-5209
Email Address	William.Ralston@ky.gov
Alternate Contact	William Ralston, MD
Service	Postmortem forensic toxicology testing services provided to office since 2006.
Description of Client	Axis currently serves the Commonwealth of Kentucky Medical Examiner System and has developed a strong partnership that includes the public health information tracking desired by the State. Axis provides forensic toxicology testing of blood, urine, and vitreous to all Kentucky Counties and Regional Medical Examiner offices. Axis works with the state office to manage the testing provided consistent with their statewide mandate. In addition, Axis assists with training, testimony, grant proposals, and reporting to the Violent Death Reporting System and the statisticians at the University of Kentucky who are consolidating and working with the toxicology data to identify ways to help the citizens of Kentucky. In 2017, the Medical Examiner Division performed services for about 2,471 deaths. Perform upon request from the Commonwealth of Kentucky an analysis on postmortem specimens including whole blood, vitreous fluid, tissue, and other specimen unique to the postmortem state as directed from the office of the state Medical Examiner and/or from Kentucky's 120 county coroners and their deputies with approval from the Chief Medical Examiner and/or his /her designee.

PROFESSIONAL EXPERIENCE, LICENSES, CERTIFICATIONS, AND EDUCATION

Axis's company structure (Exhibit E) ensures business stakeholders and laboratory expert input is used to drive business and product development decisions. This structure allows for a strong foundation that incorporates science-based information and business practices that are mutually beneficial to the business, its employees, and the clients we serve. This structure ensures Axis remains a good steward to the resources and services it provides to the community and our clients and meets the values the company stands on:

Innovation | Relevance | Integrity | Leadership

The key Axis personnel listed below have worked with the County for the duration of the business relationship. The extended tenure has enabled them to build rapport and credibility with the coroners and medical examiners of the County, as well as the extended justice system.

Axis' toxicologists routinely provide consultation regarding the returned results and have provided testimony for trials in the state of Missouri. Axis' operations management team consults with the coroners and medical examiners to ensure that critical and complex cases receive special handling as needed to ensure that Axis is providing timely, relevant and accurate testing results.

TOXICOLOGISTS AND LAB MANAGEMENT (5.1.8.2)

Please see the attached Curriculum Vitae or resume for the following key laboratory personnel:

- George Behonick, Ph.D., F-ABFT - Laboratory Director and Chief Toxicologist
- Kevin G. Shanks, MS, D-ABFT-FT - Senior Toxicologist
- Matthew Zollman, BS, MBA – Director of Operations and Product Management
- Katherine Alexander, BS, MBA – Operations Manager
- Marcie Larson, BS – Technical Manager
- Stuart Kurtz, MS - Toxicologist

LABORATORY DIRECTOR AND CHIEF TOXICOLOGIST, GEORGE S. BEHONICK, PH.D., F-ABFT (5.1.8.3)

George S. Behonick, Ph.D., has been a member of the toxicology team at Axis (formerly the forensic division of AIT Laboratories) since 2009, after serving as the director of forensic toxicology at UMass Memorial Medical Center Department of Hospital Laboratories and assistant professor of pathology at the University of Massachusetts Medical School in Worcester, MA. Prior to that, Dr. Behonick was a forensic toxicologist for six years with the Virginia Department of Forensic Science Western Laboratory in Roanoke, Va. This period of time included extensive experience in complex postmortem drug-related cases, notably involving the opiate and opioid classes, extensive scientific expert witness testimony in driving under the influence (DUI/DUID) of alcohol and/or drug(s) criminal court cases.

Dr. Behonick earned his bachelor's degree from The Citadel in Charleston, S.C.; his master's degree from Hahnemann University in Philadelphia, PA.; and his doctorate from St. John's University in Queens, N.Y. In 1998, Dr. Behonick completed a postdoctoral research associateship through the National Research Council/National Academy of Sciences at the United States Army Medical Research Institute of Chemical Defense, Aberdeen-Edgewood Area, and M.D. He also holds Fellow status with the American Board of Forensic Toxicology (ABFT).

See Exhibit F for Dr. Behonick's Curriculum Vitae and proof of Fellow status with the American Board of Forensic Toxicology.

SENIOR FORENSIC TOXICOLOGIST, KEVIN G. SHANKS, MS, D-ABFT-FT

Toxicologist Kevin Shanks Kevin has been with Axis Forensic Toxicology (formerly the forensic business division of AIT Laboratories) since 2003. He has extensive experience in research and development as well as laboratory supervision and management. His areas of expertise include liquid chromatography mass spectrometry (LC/MS) and the analytical detection and toxicology of new psychoactive substances (NPS) such as substituted cathinones, synthetic cannabinoids, NBOME hallucinogens, fentanyl analogs, and opioid research chemicals. Kevin oversees all method development and validation of analytical methods for NPS and other esoteric substances at Axis. He has provided fact and expert witness testimony in drug chemistry, human performance toxicology, and postmortem toxicology matters in numerous states across the USA.

His educational background includes a Bachelor of Arts in Biology from Franklin College in Franklin, Indiana and a Master of Science in Forensic Toxicology form the University of Florida. He is certified as a Diplomate of the American Board of Forensic Toxicology in forensic toxicology (D-ABFT-FT) and holds regular membership with the American Academy of Clinical Toxicology (AACT) and the Society of Forensic Toxicologists (SOFT). He is a member of SOFT's Young Forensic Toxicologist committee and SOFT's Designer Drugs committee. Kevin has published papers on new psychoactive substances in journals such as Journal of Analytical Toxicology (JAT) and Forensic Science International (FSI) and presented research at national meetings such as the SOFT annual conference.
See Exhibit F for Kevin Shanks's Curriculum Vitae and proof of Diplomate status with the American Board of Forensic Toxicology.

DIRECTOR OF OPERATIONS AND PRODUCT MANAGEMENT, MATTHEW ZOLLMAN, BS, MBA

Matt Zollman is the Director of Operations & Product Management for Axis Forensic Toxicology where he oversees the daily operations of the laboratory and test offerings to meet market needs. He has been with Axis/AIT Laboratories since 2008. Matt graduated from Purdue University with a Bachelor of Science degree in Biology and from Butler University with a Master of Business Administration.

See Exhibit G for Matthew Zollman's Resume.

OPERATIONS MANAGER, KATHERINE ALEXANDER, BS, MBA

Katherine Alexander is the Operations Manager of the laboratory for Axis Forensic Toxicology. She has been with Axis/AIT Laboratories since 2010, with most of those years in a supervisory or management role. Her primary focus is ensuring an efficient throughput of workflow from arrival of a case through to reporting results to the client to meet client's turnaround time and quality expectations. She graduated with a Bachelor of Science in Environmental Management from Indiana University - Bloomington and a Master of Business Administration at Butler University.

See Exhibit G for Katherine Alexander's Resume.

TECHNICAL MANAGER, MARCIE LARSON, BS

Marcie Larson is a Technical Manager for Axis Forensic Toxicology where she oversees the instrumentation and aids in providing technical expertise to R&D and laboratory staff. She has been with Axis/AIT Laboratories since 2007. In the summer of 2008, Marcie presented a poster titled A UPLC-MS/MS Method for Analyzing Eight Drugs: A Sixty Percent Reduction in Runtime vs. HPLC-MS/MS at AACC's annual conference. Her experience includes confirmatory instrumentation, data analysis, and data certification. Marcie received her Bachelor of Science in Chemistry and a Bachelor of Arts in History from Saint Joseph's College.

See Exhibit G for Marcie Larson's resume.

TOXICOLOGIST, STUART KURTZ, MS

Stuart Kurtz is a Toxicologist for Axis Forensic Toxicology where he reviews cases for release. He has been with Axis since 2018. Stuart received his Bachelor of Arts in Chemistry from Goshen College and Master of Science in Forensic Science/Forensic Chemistry from Indiana University Purdue University Indianapolis.

See Exhibit F for Stuart Kurtz's resume.

LABORATORY PERSONNEL

Laboratory personnel assigned to the testing and analyzing of laboratory results (i.e. Analytical Chemist I, II, and R&D Scientist) at Axis Forensic Toxicology meet or exceed the minimum laboratory experience and education requirements as set forth by the American Board of Forensic Toxicology, CLIA, and CAP for high complexity tests. In addition to meeting the minimum training and education requirements as set forth in the accreditations and certifications, laboratory personnel must undergo a minimum of 10 hours of continuing education per year and pass an annual competency.

DESCRIPTION OF LABORATORY (5.1.8.4)

Axis' facility meets or exceeds all NAME standards for toxicology laboratory space, including working, instrumentation, and storage space. It includes fume hoods and adequate workplace ventilation as well as sufficient aisle space to allow for safe movement within the facility.

See Exhibit D for the Laboratory Floor Plan.

ADMINISTRATION

BILLING (5.1.8.17)

Axis will furnish JCMEO with an itemized invoice that meets with specifications of the RFP. Standard client invoices are sent weekly for the prior week's reported cases/tests and the terms of payment are due upon receipt. Invoices contain the following information:

- Axis' name and remittance address
- Invoice date
- Axis Client Account ID
- Subject name
- Date of service (toxicology case report date)
- Laboratory order number
- Test(s) order code and description
- Charges

Please see Exhibit I for an example of an Axis invoice.

PAYMENT OPTIONS

Axis provides three (3) convenient ways to pay:

- Online via credit card by going to www.axisfortox.com and clicking on "Payments." All credit card carriers accepted.
- Check remittance to Axis Forensic Toxicology, P.O. Box 681513, Indianapolis, IN 46268.

- Via ACH/EFT payment. Please email billing@axisfortox.com or call them at 317-759-4TOX (option 1) to set up this payment option.

COMPREHENSIVE REPORTING (5.1.8.14)

Axis reports meet or exceed the standards and requirements set forth by CAP, CLIA, ABFT and ISO/IEC 17025:2017. Toxicology reports from Axis contain all information necessary to identify the cases and its source.

Information includes*:

- Agency name and address of client
- Name of subject
- Case number/autopsy number
- Date of death/autopsy
- Date specimens received and date of report
- Identification of all case specimens
- Identification of testing performed (test code and test name)
- Quantitative/Qualitative test results for all case specimens
- Reference ranges (therapeutic), if available, for all test results
- Signature of certifying toxicologist

*Some information must be provided by client to be included on final report

Please see Exhibit J for an example of an Axis Forensic Toxicology Report.

After a toxicologist certifies and releases the final toxicology report, the report is released to the JCMEO via fax or secure web portal. If JCMEO needs a partial release of information, they can request a preliminary release of the case (through its established reporting queues), following by resumption of testing and a final report.

CASE MANAGEMENT PORTAL (5.1.8.5)

Axis' Case Management Portal provides clients with a secure and easily accessible way to view the status of cases sent for testing and view/print toxicology reports that have been completed. A unique web portal account will be set up for each user requested by the JCMEO and there is no limit to the number of accounts that can be set up.

When a final toxicology report has been released, the County's portal users receive an email notification. Online portal results may be accessed by going to www.axisfortox.com and clicking on "Portal" in the upper right-hand corner of our website. In addition to receiving reports, portal users may check on the status of cases sent to our laboratory to see if a case has been received, testing is still pending, or testing has been completed. Final toxicology reports may be printed or downloaded from the portal to be included in the final case file.

A copy of the Case Management Portal User Guide is included in Exhibit L.

SPECIMEN STORAGE, RETURN, AND RECORD RETENTION (5.1.8.13)

Once toxicology testing is complete, Axis will preserve in long term storage the case and any remaining specimen volume that was not used during testing for a minimum of one (1) year after the last toxicology report date. There is no charge for storage of untested specimens within a case. Specimen storage for an additional year is charged at a flat fee per month (regardless of the number of cases), see price list.

Axis can also return a case and any remaining specimen volume that was not used during testing (including specimens that were submitted but not tested) to the client upon completion of testing.

Axis's Records Retention policy, which complies with ABFT and CAP guidelines, is to retain testing records for five (5) years from final case report.

CUSTOMER SUPPORT (5.1.8.14)

Axis is committed to providing a knowledgeable and efficient client services model that ensures the most qualified individuals meet the needs of our clients. Depending on the County's need, each area of Axis may be reached by calling 317-759-4TOX or via the contact information below: (Scope item 21/22)

Department	Description	Email
Billing	Billing questions and payment assistance	billing@axisfortox.com
Supplies	Request collection supplies, update account information	supplies@axisfortox.com
Toxicologists	Interpretation and discussion of test results	toxicologists@axisfortox.com
Lab Client Support	Check case status or request changes to the testing performed	labclientsupport@axisfortox.com
Case Management Portal	Troubleshooting assistance for online portal	portal@axisfortox.com
Litigation	Securing records or testimony	litigation@axisfortox.com

In addition to its standard support services, Axis has established relationships with the JCMEO to enable direct access between JCMEO staff and Axis management/leadership that extends the level of service offered in both scope and availability.

PRIVACY AND AUTHORIZATION

At Axis, we know that our toxicology report is only one piece of the puzzle when it comes to solving a case. We respect the needs of our clients to control access to that information, so that they can share with their community the full picture.

In support of that objective, Axis has strict controls in place to prevent disclosure of information or release of specimens to unauthorized parties. We are diligent in our efforts to determine the identity and authorization status of persons requesting anything with regard to cases.

Axis agrees to maintain strict confidentiality of information on any and all County cases, including any and all involved names, dates, histories, specimens, results and communications with the JCMEO and that information, results, records or specimens may not be released Axis employees to any person or organization without prior express written permission of the JCMEO or a signed court order from a court of competent jurisdiction.

When permission is given, Axis will serve the authorized party as it would the County. See Exhibit I for a sample Case Release Form.

TOXICOLOGIST CONSULTATION AND TESTIMONY

Axis' toxicologists work directly with the laboratory's Research and Development department and their work has been published in distinguished scientific journals such as the American Academy of Forensic Sciences Journal of Forensic Science and at the annual Society of Forensic Toxicologists (SOFT) Conference.

Axis prides itself on making its toxicologists freely available to clients to provide important consultation to ensure confidence in the client's final determination. Our toxicologists know that there is more to a case than numbers on a page and are committed to supporting our clients to have confidence in their determinations.

Axis can also provide a board-certified toxicologist for neutral testimony via telephone, videoconference, or in person if required by the court. Axis provides a Litigation Specialist who is available by phone to assist in arranging your expert services (i.e. subpoenas, litigation packages, and scheduling testimony) and answer your questions, if the need arises.

FELLOWSHIP (5.1.8.12)

Axis provides a week-long forensic pathology fellow training program that meets the requirements of ACGME at no additional charge to the county. (The County bears the cost of transportation, lodging, and food.)

INSURANCE

Axis shall continuously maintain insurance as specified and appropriate to its business.

EXHIBITS

CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Axis Forensic Toxicology, Inc.

5780 W 71st Street, Indianapolis, Indiana 46278 USA

Fulfills the requirements of

ISO/IEC 17025:2017

ANAB Forensic Testing & Calibration AR 3125:2019

ABFT Forensic Toxicology Laboratory Accreditation Requirements:2013

In the field of

Forensic Testing

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

Pamela L. Sale, Vice President, Forensics

Expiry Date: 31 July 2023
Certificate Number: FT-0152

SCOPE OF ACCREDITATION TO:
ISO/IEC 17025:2017
ANAB Forensic Testing & Calibration AR 3125:2019
ABFT Forensic Toxicology Laboratory Accreditation Requirements:2013

Axis Forensic Toxicology, Inc.

5780 W 71st Street
Indianapolis, Indiana 46278 USA

FORENSIC TESTING

Expiry Date: 31 July 2023 Certificate Number: FT-0152

Discipline: Toxicology		
Component/Parameter	**Item**	**Key Equipment/Technology**
Qualitative Determination	Ante-Mortem Biological Item Post-Mortem Biological Item	Gas Chromatography Liquid Chromatography Mass Spectrometry Ultraviolet Spectroscopy Visible Spectroscopy
Qualitative Determination (Volatiles)	Biological Item	Gas Chromatography
Quantitative Measurement	Ante-Mortem Biological Item Post-Mortem Biological Item	Gas Chromatography Liquid Chromatography Mass Spectrometry Ultraviolet Spectroscopy Visible Spectroscopy
Quantitative Measurement (Volatiles)	Biological Item	Gas Chromatography

When published on a forensic service provider's Scope of Accreditation, ANAB has confirmed the competence required to develop and validate methods and perform on-going quality assurance for accredited activities. For a listed component/parameter, the forensic service provider may add or modify methods for activities without formal notice to ANAB for items and key equipment/technology listed. Contact the forensic service provider for information on the method utilized for accredited work.

Pamela L. Sale
Vice President, Forensics

2000 Regency Parkway, Suite 430, Cary, NC 27518
414-501-5494
www.anab.org

COLLEGE of AMERICAN PATHOLOGISTS

CERTIFICATE OF ACCREDITATION

Axis Forensic Toxicology Inc
Laboratory
Indianapolis, Indiana
George S. Behonick, PhD

CAP Number: 6948901
AU-ID: 1195687
CLIA Number: 15D0647225

The organization named above meets all applicable standards for accreditation and is hereby accredited by the College of American Pathologists' Laboratory Accreditation Program. Reinspection should occur prior to **December 7, 2023** to maintain accreditation.

Accreditation does not automatically survive a change in director, ownership, or location and assumes that all interim requirements are met.

Michael Bradley Datto, MD, PhD, FCAP
Chair, Accreditation Committee

Emily Volk, MD, FCAP
President, College of American Pathologists

CENTERS FOR MEDICARE & MEDICAID SERVICES

CLINICAL LABORATORY IMPROVEMENT AMENDMENTS

CERTIFICATE OF ACCREDITATION

LABORATORY NAME AND ADDRESS

AXIS FORENSIC TOXICOLOGY
5780 W 71ST
INDIANAPOLIS, IN 46278

CLIA ID NUMBER

15D0647225

EFFECTIVE DATE

01/07/2022

LABORATORY DIRECTOR

GEORGE S BEHONICK Ph.D.

EXPIRATION DATE

01/06/2024

Pursuant to Section 353 of the Public Health Services Act (42 U.S.C. 263a) as revised by the Clinical Laboratory Improvement Amendments (CLIA), the above named laboratory located at the address shown hereon (and other approved locations) may accept human specimens for the purposes of performing laboratory examinations or procedures.

This certificate shall be valid until the expiration date above, but is subject to revocation, suspension, limitation, or other sanctions for violation of the Act or the regulations promulgated thereunder.

CMS
CENTERS FOR MEDICARE & MEDICAID SERVICES

Regina S. Van Brakle

Regina S. Van Brakle, Acting Director
Division of Laboratory Services
Survey and Certification Group
Center for Clinical Standards and Quality

167 Certs2_011122

If you currently hold a Certificate of Compliance or Certificate of Accreditation, below is a list of the laboratory specialties/subspecialties you are certified to perform and their effective date:

LAB CERTIFICATION (CODE)	EFFECTIVE DATE	LAB CERTIFICATION (CODE)	EFFECTIVE DATE
TOXICOLOGY (340)	06/15/2005		

FOR MORE INFORMATION ABOUT CLIA, VISIT OUR WEBSITE AT WWW.CMS.GOV/CLIA
OR CONTACT YOUR LOCAL STATE AGENCY. PLEASE SEE THE REVERSE FOR
YOUR STATE AGENCY'S ADDRESS AND PHONE NUMBER.
PLEASE CONTACT YOUR STATE AGENCY FOR ANY CHANGES TO YOUR CURRENT CERTIFICATE.

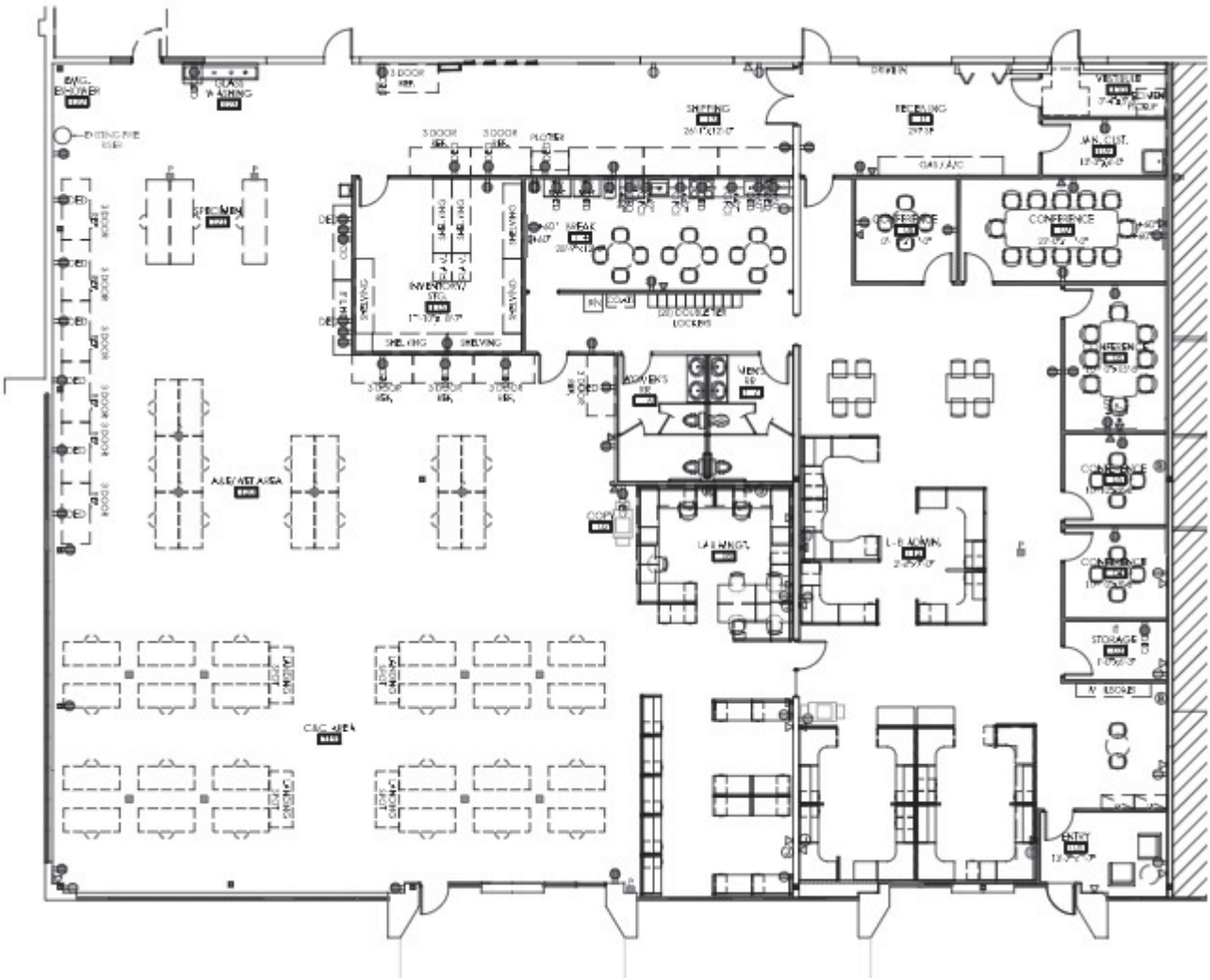
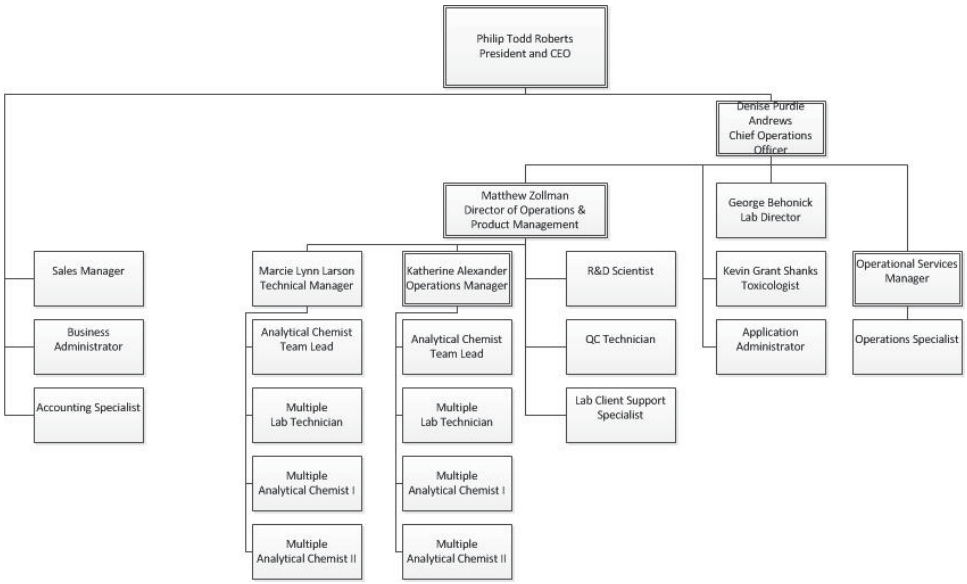

CONFERENCE
CONFERENCE
STORAGE
ENTRY

EXHIBIT E – AXIS ORGANIZATIONAL CHART



GEORGE S. BEHONICK

KEVIN G. SHANKS

STUART KURTZ

AMERICAN BOARD OF FORENSIC TOXICOLOGY

INCORPORATED 1976 IN THE DISTRICT OF COLUMBIA

THE AMERICAN BOARD OF FORENSIC TOXICOLOGY, INC., HEREBY DECLARES
THAT THE PROFESSIONAL EDUCATION, ATTAINMENTS,
AND COMPETENCE OF

GEORGE BEHONICK, Ph.D.

HAVE BEEN FOUND SATISFACTORY, AND THAT THE OTHER REQUIREMENTS OF
THIS BOARD HAVE BEEN FULFILLED; AND THEREFORE GRANTS THIS
CERTIFICATE OF QUALIFICATION IN FORENSIC TOXICOLOGY AS A

FELLOW

GRANTED THE FIRST DAY OF JANUARY, 2020
EXPIRES THE THIRTY-FIRST DAY OF DECEMBER, 2024

RECOGNIZED BY

American Academy of Forensic Sciences
California Association of Toxicologists
Society of Forensic Toxicologists
Canadian Society of Forensic Science
Southwestern Association of Toxicologists

PRESID

VICE-PRESI

SECR

CURRICULUM VITAE

As of June 2022

George S. Behonick BS, MS, Ph.D., F-ABFT

Axis Forensic Toxicology

P.O. Box 681513

Indianapolis, Indiana 46241

Office Phone: 317-759-4869

Mobile Phone: 317-627-9663

Email: gbehonick@axisfortox .com

CURRENT POSITION

Director, Chief Toxicologist-Axis Forensic Toxicology, Indianapolis, IN

(Effective July 2016 Axis Forensic Toxicology became incorporated and purchased the Forensic Toxicology Unit from American Institute of Toxicology, Inc., aka AIT Laboratories)

- Ensures compliance to ABFT/ISO17025(ANAB), CAP and CLIA accreditation standards
- Approval authority to all technical standing operating procedures (SOPs)
- Provides oversight to and approval authority for the validation and re-validation procedures of analytical methods
- Scientific technical advisor to laboratory executive and business management groups
- Reviews/certifies forensic toxicology reports
- Provides expert scientific testimony in criminal/civil litigations and depositions
- Compiles written scientific opinions and interpretation to clients
- Consults with medical examiners, coroners, law enforcement and prosecuting/defense attorneys and other stakeholders

PRIOR ACADEMIC APPOINTMENT (2005-09)

Assistant Professor of Pathology

Department of Pathology

University of Massachusetts Medical School

Worcester, MA

EDUCATION

High School: Pope John XXIII Regional High School 1971-75, Sparta NJ (Diploma)

EDUCATION (Cont.)

Preparatory School: Admiral Farragut Academy Naval Preparatory School 1975-76, Pine Beach, NJ (Postgraduate Certificate)

Undergraduate: The Citadel 1976-80, Charleston, SC (BS)

Graduate: Hahnemann University 1980-83, Philadelphia, PA (MS)

Graduate: St. John's University 1992-1997, Jamaica, NY (Ph.D.)

Postdoctoral: Research Associate, National Research Council/National Academy of Sciences, U.S. Army Medical Research Institute of Chemical Defense (USAMRICD), Edgewood Area-Aberdeen Proving Ground, MD, 1997-98

OTHER TRAINING

The care and use of laboratory animals (short course), Renaissance Research Associates August 1997, USAMRICD, Edgewood Area-Aberdeen Proving Ground, MD

Fundamentals of alcohol testing and interpretation, SOFT Annual Meeting Workshop, Salt Lake City, UT, October 1997

American Red Cross adult CPR course, USAMRICD, Edgewood Area-Aberdeen Proving Ground, MD, November 1997

Drug testing and forensic analyses seminar, Hewlett Packard-Wilmington, DE, March 1998

Liquid chromatography electrochemical detection (LCEC) and chromatography control and data acquisition workshop, Bioanalytical Systems, Inc. -Neptune, NJ, April 1998

Postmortem pediatric forensic toxicology: Issues in childhood poisoning, American Academy of Forensic Sciences Workshop, Orlando, FL, February 1999

Marijuana: A forensic symposium, American Academy of Forensic Sciences Workshop, Orlando, FL, February 1999

Intoxilyzer 5000 Breath Alcohol Operator Course, Division of Forensic Science-Richmond, VA, December 1999

Benzodiazepines: Pharmacology and analytical challenges, SOFT Annual Meeting Workshop, Milwaukee , WI, October 2000

"Observations and Facts": The September 11, 2001 World Trade Center Attacks, National Medical Services, Willow Grove, PA, June 2002

Agilent GC-MSD ChemStation and Instrument Operation (Course No. H4043A), Richmond , VA, July 2002

Statistics and Method Validation: FBI Laboratory Symposium on Forensic Toxicology, Joint SOFT/TIAFT Meeting, Washington, DC, August 30-September 3, 2004

OTHER TRAINING (Cont.)

Poisons and Poisoners-What a toxicologist needs to know, FBI Laboratory Symposium on Forensic Toxicology, Joint SOFT/TIAFT Meeting, Washington, DC, August 30-September 3, 2004

SOFT/AAFS guidelines & forensic toxicology laboratory accreditation, FBI Laboratory Symposium on Forensic Toxicology, Joint SOFT/TIAFT Meeting, Washington, DC, August 30-September 3, 2004

The postmortem "blood drug screen", SOFT Annual Meeting Workshop, Nashville, TN, October 2005

Postmortem toxicology interpretation, SOFT Annual Meeting Workshop, Nashville, TN, October 2005

Method validation and measurement of uncertainty for dummies...and smarties too, SOFT Annual Meeting Workshop, Austin, TX, October 2006

CE committee: How does your QA/QC program measure up? SOFT Annual Meeting Workshop, Austin, TX, October 2006

Benzodiazepines: The basics and beyond, SOFT Annual Meeting Workshop, Durham, NC, October 2007

LC-MS in the 21 st century, SOFT Annual Meeting Workshop, Durham, NC, October 2007

Preparing for ISO 17025 accreditation-what you need to know, SOFT Annual Meeting Workshop, Phoenix, AZ, October 2008

Pain management and addiction, SOFT Annual Meeting Workshop, Phoenix, AZ, October 2008

Crawford Motions: The right to confrontation & how recent rulings may affect forensic laboratory management and expert testimony, SOFT Annual Meeting Workshop, Oklahoma City, OK ,October 2009

Envenomations: Toxins, anti-venoms & clinical course, SOFT Annual Meeting Workshop, Oklahoma City, OK, October 2009

Autopsy hair collection-just pull it, SOFT Annual Meeting Workshop, Oklahoma City, OK, October 2009

Use of pharmacogenetics in personalized pain management, SOFT Annual Meeting Workshop, Richmond, VA, October 2010

A stroll through the cannabinoid field: Pharmacology, therapeutics and untoward effects, SOFT Annual Meeting Workshop, Richmond, VA, October 2010

Beyond the numbers: An objective approach to forensic toxicological interpretation, American Academy of Forensic Sciences 65th Annual Scientific Meeting Workshop (#6), Washington, DC, February 2013

Ohio's assertive approach to scheduling opioids and fentanyl analogs, American Academy of Forensic Sciences 70th Annual Scientific Meeting Workshop (#5), Seattle, WA, February 2018

Fentalogs: Chemistry, pharmacology, and toxicology of illicit fentanyl and emerging opioids, American Academy of Forensic Sciences 70th Annual Scientific Meeting Workshop (#20), Seattle, WA, February 2018

Cannabis impaired driving, SOFT Annual Meeting Workshop (SOFTember Virtual Meeting), September 2020

OTHER TRAINING (Cont.)

GC-MS and LC-MS/MS method development-a step by step guide, SOFT Annual Meeting Workshop (SOFTember Virtual Meeting), September 2020

A new realm of novel psychoactive substance (NPS) opioids and NPS benzodiazepines –analytical and interpretive considerations, American Academy of Forensic Sciences 73rd Annual Scientific Virtual Meeting-Workshop (#11), February 2021

Strategies for screening of NPS in forensic toxicology, SOFT Annual Meeting Workshop, Nashville, TN, September 2021

MILITARY SERVICE

Commission: United States Army, May 17, 1980

Branch: Medical Service Corps

Active Duty: October 1982-December 1992, Honorable Discharge, rank CPT

Reserve Duty: January-October 1993, Honorable Discharge, rank CPT(P)

POSITIONS HELD/WORK EXPERIENCE

July 2016 – Present: Director, Chief Toxicologist, Axis Forensic Toxicology

November 2009-July 2016: Toxicologist, AIT Laboratories, Indianapolis, IN

January 2005-November 2009: Director, Forensic Toxicology UMass Memorial Medical Center Department of Hospital Laboratories and Assistant Professor, Department of Pathology, University of Massachusetts Medical School, Worcester, MA

2001-December 2004: Forensic Toxicologist, Commonwealth of Virginia Department of Criminal Justice Services, Division of Forensic Science-Western Laboratory, Roanoke, VA

1998-2001: Forensic Scientist, Commonwealth of Virginia Department of Criminal Justice Services, Division of Forensic Science-Western Laboratory, Roanoke, VA

1997-1998: NRC Postdoctoral Research Associate, U.S. Army Medical Research Institute of Chemical Defense, Edgewood Area-Aberdeen Proving Ground, MD

1993-1996: Teaching fellow, Department of Pharmaceutical Sciences, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, NY

1991-1992: Personnel counselor, U.S. Army Health Professional Support Agency, Washington, DC with duty at Fort Totten, NY

1989-1991: Chief , Special Chemistry, 10th Medical Laboratory, Landstuhl, Germany

March 1989-May 1989: U.S. Army Combined Arms Services Staff School, Fort Leavenworth, KS

1988 -1989: U.S. Army Medical Department Officers' Advanced Course, Fort Sam Houston, TX

POSITIONS HELD/WORK EXPERIENCE (Cont.)

1986-1988: Chief, Pathology Service, Fox Army Community Hospital, Redstone Arsenal, AL

1985 -1986: Officer- In- Charge, Emergency Procedures (STAT} Laboratory, Dwight David

Eisenhower Army Medical Center, Fort Gordon, GA

1984-1985: Medical Service Corps Clinical Laboratory Officers' Course, Walter Reed Army Medical Center, Washington, DC

1983 -1984: Medical Platoon Leader, 5th Battalion, 16th Infantry, 1st Infantry Division (Mechanized), Fort Riley, KS

October 1982-December 1982: U.S. Army Medical Department Officers' Basic Course, Fort Sam Houston

HONORS AND AWARDS

National Honor Society, Pope John XXIII Regional High School, Sparta, NJ

Magna Cum Laude, Admiral Farragut Academy, Pine Beach, NJ

Dean's List-7 Semesters, The Citadel

Gold Stars (High Honors), The Citadel

Army Service Ribbon

Army Achievement Medal

Army Commendation Medal with two oak leaf clusters

Army Meritorious Service Medal

National Defense Service Ribbon

Expert Field Medical Badge

Outstanding Young Men of America, 1990

Beta Beta Beta Biological Honor Society, The Citadel chapter

Rho Chi Honor Society, St. John's University chapter

June K. Jones Scholarship-American Academy of Forensic Sciences Toxicology Section, 1996

Society of Forensic Toxicologists Educational Research Award, 1996

NRC/National Academy of Sciences Research Associateship, 1997

Cambridge Who's Who Registry of Executives, Professionals and Entrepreneurs, 2009-2010

SCHOLARSHIPS

United States Army-The Citadel

Spirit of '76 Scholarship-The Citadel

Teaching Fellowship-St. John's

PROFESSIONAL CERTIFICATIONS

F-ABFT, Fellow-American Board of Forensic Toxicology (ABFT Certificate No. 1021, September 2004), re-qualification effective January 1, 2020 through December 31, 2024

New York State Department of Health Certificate of Qualification, Laboratory Director with qualification in the categories of Forensic Toxicology and Therapeutic Substance Monitoring/Quantitative Toxicology, expiration September 2023

PROFESSIONAL AFFILIATIONS

American Academy of Forensic Sciences-Toxicology Section

Society of Forensic Toxicologists

TEACHING EXPERIENCE

1993-1996: Biopharmaceutical chemistry laboratory (3 semesters), Human Anatomy and Physiology laboratory (4 semesters, 2 summer sessions), College of Pharmacy and Allied Health Professions, St. John's University

2006-2009: Resident and Fellow Rotation Forensic Toxicology, Massachusetts Office of the Medical Examiner (Forensic Medicine Fellowship training) and University of Massachusetts Medical School Department of Pathology Residency Training, Worcester, MA

2013-Present: Forensic Medicine Fellow Toxicology Laboratory Rotation training

FUNDED RESEARCH

National Institutes of Health (NIH)/National Institute on Drug Abuse (NIDA), grant# 1 R03 DA019047-01AI, Opioid mortality in southwestern Virginia , co-investigator, August 5, 2005-November 2007

SCIENTIFIC PUBLICATIONS AND PRESENTATIONS

Chapters

Baskin, S.I. and Behonick, G.S. Cardiac toxicology *In:* General and Applied Toxicology, Vol. 2 (2nd ed.), eds. Ballantyne, B., Marrs, T. and Syversen, T. Macmillian Reference Ltd, London and Grove's Dictionaries Inc., pp. 803-826 (1999)

Journal Articles (Peer Reviewed)-20

Behonick, G.S., Vallaro, G.M., Hodnett, C.N.H. Wurpel, J.N.D. and Bidanset, J.H. The distribution of fatty acid ethyl esters in Long Evans rats following acute ethanol ingestion. Toxicology Methods, 7(1):17-25 (1997)

Vallaro, G.M., Behonick, G.S., Hodnett, C.N.H., Wurpel, J.N.D. and Bidanset, J.H. Acute temporal distribution of fatty acid ethyl esters in pregnant Long Evan s rats. Toxicology Methods, 7(2):97-110 (1997)

Behonick, G.S., Novak, M.J., Nealley, E.W. and Baskin, S.I., Toxicology update: the cardiotoxicity of the oxidative stress metabolites of catecholamines (aminochromes). J Applied Toxicology, 21, S15-S22 (2001)

Baskin, S.I., Behonick, G.S., Schafer, R.J., Novak, M.J. and Arroyo, C.M. Analytical methods to detect the autoxidation of adrenolutin as a step in catecholamine metabolism. Toxic Substance Mechanisms, 19:239-252 (2001)

Kuhlman, J.J. Jr., McCaulley, R., Valouch, T.J. and Behonick, G.S. Fentanyl use, misuse and abuse: A summary of 23 postmortem cases. J Analytical Toxicology, 27:499-504 (2003)

Tabor, K.L., Fell, R.D., Brewster, C.C., Pelzer, K. and Behonick, G.S. Effects of antemortem ingestion of ethanol on insect successional patterns and development of *Phormia regina* (Diptera: Calliphoridae). J Medical Entomology, 42(3):481-489 (2005)

Hull, M.J., Juhascik, M., Mazur, F., Flomenbaum, M.A. and Behonick, G.S. Fatalities associated with fentanyl and co-administered cocaine and opiates. J Forensic Sciences, 52(6):1383 -1388 (2007)

Wunsch, M.J., Nakamoto, K., Behonick, G. and Massello, W. Opioid deaths in rural Virginia: A description of the high prevalence of accidental fatalities involving prescribed medications. American Journal on Addictions, 18(1):5-14 (2009)

Wunsch, M.J., Nakamoto, K., Nuzzo, P., Behonick, G.S. Massello, W. and Walsh, S. Prescription drug fatalities among women in rural Virginia: A study of medical examiner cases. Journal of Opioid Management, 5(4):228-236 (July/August 2009)

Shanks, K.G., Dahn, T. Behonick, G. and Terrell, A. Analysis of first and second generation legal highs for synthetic cannabinoids and synthetic stimulants by ultra-performance liquid chromatography and time of flight mass spectrometry. J Analytical Toxicology, 36:360-371 (2012)

Wunsch, M.J., Nuzzo, P.A., Behonick, G., Massello, W. and Walsh, S. Methadone-related overdose deaths in rural Virginia: 1997-2003. J Addiction Medicine, 7(4):223-229, (July/August 2013)

Shanks, K.G., Dahn, T., Behonick, G. and Terrell, A. Identification of novel third generation synthetic cannabinoids in products by ultra-performance liquid chromatography and time of flight mass spectrometry. J Analytical Toxicology, 37:517-525 (2013)

Journal Articles (Peer Reviewed Cont.)

Quigley, K., Shanks, K., Behonick, G. and Terrell, A. A guide for the interpretations of postmortem methamphetamine findings: A series of case reports. J Forensic Toxicolo Pharmacol, Vol. 3. Issue 2 doi:10.4172/2325-9841.1000117 (2014)

Behonick, G., Shanks, K., Firchau, D., Mathur, G., Lynch, C., Nashelsky, M., Jaskierny, D. and Meroueh, C. Four postmortem case reports with quantitative detection of the synthetic cannabinoid, 5F-PB-22.. J Analytical Toxicology, 38:559-562 (2014)

Shanks, K., Winston, D., Heidingsfelder, J. and Behonick, G. Case reports of synthetic cannabinoid XLR-11 associated fatalities. Forensic Sci Int ., 252 ,e6-e9 {2015)

Shanks, K., Sozio, T. and Behonick, G. Fatal intoxications with 25B-NBOMe and 25I-NBOMe in Indiana during 2014. J Analytical Toxicology, 39:602-606 (2015)

Shanks, K. Clark, W. and Behonick, G. Death associated with the use of the synthetic cannabinoid ADB-FUBINACA. J. Analytical Toxicology, 40(3):240-242 (2016)

Shanks, K.G. and Behonick, G.S. Detection of carfentanil by LC-MS-MS and reports of associated fatalities in the USA. J Analytical Toxicology, 41:466-472 (2017)

Butler, D.C., Shanks, K., Behonick, G.,S. Smith D., Presnell, S.E., and Tormos, LM. Three cases of fatal acrylfentanyl toxicity in the United States and a review of literature. J Analytical Toxicology, 28:1-6 (2017)

Behonick, G.S., Vu, C., Czarnecki, L., El-Tiers, M., and Shanks, K.G. Two single-drug fatal intoxications by mitragynine. J Analytical Toxicology, 46:e110-e114 (2022)

Other Articles/Technical Notes - 5

Behonick,G.S. and Baskin, S.I. Fenfluramine and phentermine ("Fen-Phen") ToxTalk 22(1):6 (1998)

Behonick, G.S. and Massello, W. Case notes: A fatal case of poly-drug intoxication with methadone, cocaine and ethanol. ToxTalk 27(2):6-7 (2003)

Juhascik, M., Habbel, S., Barron, W. and Behonick, G.S. Validation of an ELISA method for screening methadone in postmortem blood. J Analytical Toxicology, 30(8):617-620 (2006)

Behonick, G.S.and Bundock, E.A. Case notes : Fatal exsanguination due to epistaxis with therapeutic administration of topical cocaine and adrenaline. ToxTalk 31(2): 8-9 (2007)

Siek, T.J. and Behonick,G.S. Case notes: Analytical documentation of the ingestion of sodium azide: qualitative and semiquantitative analysis of sodium azide in a suicide. ToxTalk 33(2):5-6 (2009)

Abstracts/Poster Presentations-35

Vallaro, G.M., Behonick, G.S., Hodnett, C.N.H., Wurpel, J.N.D. and Bidanset, J.H. Fatty acid ethyl esters in maternal and fetal rat tissues after ethanol ingestion. SOFT Abstract Proceedings and Annual Meeting, Denver, CO (1996)

Abstracts/Poster Presentations (Cont.)

Behonick, G.S., Vallaro, G.M., Hodnett, C.N.H., Wurpel, J.N.D. and Bidanset J.H. The acute ingestion of ethanol and the distribution of fatty acid ethyl esters in rat blood, liver and brain. AAFS Abstract Proceedings and Annual Meeting, New York, NY (1997)

Behonick, G.S., Novak, M.J. and Baskin, S.I. In vitro spectrofluorometric measurement of adrenolutin, an oxidative metabolite of epinephrine. U.S. Army Medical Defense Bioscience Review Proceedings, Hunt Valley, MD (1998)

Behonick, G.S., Nealley, E.W. and Baskin, S.I. The HPLC and spectrofluorometric analysis of adrenolutin and adrenochro me: Oxidative metabolites of catecholamines. Proceedings American Academy of Forensic Sciences, K44, 285-286, Orlando, FL (1999)

Baskin S.I., Behonick, G.S., Arroyo, C.M. and Schafer, R.J. Analysis of adrenolutin and adrenochrome: oxidative metabolites of catecholamines using HPLC, spectrofluorometry and electron paramagnetic resonance analytical techniques. 41st Rocky Mountain Conference on Analytical Chemistry, 47 (1999)

Kuhlman,J.J.Jr., Huddle, B.P., Behonick, G.S., Valouch, T.J., Massello, W., Woods, T. and Saady, J. Oxycodone associated deaths in southwestern Virginia. SOFT Abstract Proceedings and Annual Meeting, 23, New Orleans, LA (2001)

Behonick, G.S., Massello, W., Kuhlman, J.J., Jr., and Saady, J. A tale of two drugs in southwestern Virginia: Oxycodone and methadone. Proceedings American Academy of Forensic Sciences, K20, 312-313, Chicago, IL (2003)

Tabor, K.L., Fell, R.D., Brewster, C.C. Pelzer, K. and Behonick, G.S. Insect succession studies on pig carrion in southwest Virginia and the effects of antemortem ethanol ingestion on insect succession and development. Proceedings American Academy of Forensic Sciences, G6, 222-223, Dallas, TX (2004)

Behonick, G.S., Valouch, T. and Venuti, S.E. Till death do us part: fentanyl poisoning in a husband and wife. Joint Meeting of SOFT and TIAFT Program and Abstracts, P22, 357, Washington, DC (2004)

Wunsch, M.J., Behonick, G.S. and Massello, W. Opioid mortality in southwestern Virginia. SOFT Meeting Abstracts, J Analytical Toxicology, 30(2):159-160 (2006)

Behonick, G.S., Kuhlman, J.J., Jr. , Wunsch, M .J. and Massello, W. Fatal salicylate poisoning secondary to septicemia as complications to atypical abuse of OxyContin®. SOFT Meeting Program and Abstracts, P18, Durham, NC (2007)

Behonick, G.S. Toxicology and National Association of Medical Examiners' recommendations in manner of death classifications in suicide. SOFT Meeting Program and Abstracts, 515, Durham, NC (2007)

Abstracts/Poster Presentations (Cont.)

Barron, W., Behonick, G.S. and Sexton, A. The detection of cocaine and benzoylecgonine in maggots recovered from decomposing human remains. Northeastern Association of Forensic Scientists 33rd Annual Meeting,P15, page 88 Program Book (Poster Session Abstracts), Bolton Landing, NY (2007)

Behonick, G.S., Valouch, T., Sexton, A., Roberts, C., and Kuhlman , J.J., Jr. Two fatal case reports of oxymorphone occurring in Massachusetts and Virginia. SOFT Meeting Program and Abstracts, S21, Phoenix, AZ (2008)

Mazur, F., Springer, K. and Behonick , G.S. Fatal case report: postmortem concentrations of fentanyl related to oral abuse of transdermal patches. SOFT Meeting Program and Abstracts, P34, Phoenix, AZ (2008)

Oles, M.A., Kane, P., Jenner, J.J., Mazur, F. and Behonick, G.S. Detection and quantitative analyses of cyanide by Cyantesmo® paper and headspace GCMS in two cases of suicide. SOFT Meeting Program and Abstracts, Oklahoma City, OK (2009)

Behonick, G.S., Shanks, K.G., and Terrell, A.R. Methylenedioxypyrovalerone (MDPV) postmortem blood concentrations: A series of suicide case reports. Proceedings American Academy of Forensic Sciences, K3, p. 514, Washington, DC (2013)

Behonick, G.S., Shanks, K.G., Kulhanek, R. and Witek, M.J. Cause of death-acute alcohol poisoning, manner of death-suicide: a case study. Proceedings American Academy of Forensic Sciences, GI 48, p. 378, Washington, DC (2013)

Kitts, K., Shanks, K. and Behonick, G. Evaluation of postmortem methamphetamine concentrations: a series of case studies. Proceedings of the Midwestern Association of Forensic Scientists Annual Meeting, P45, Dayton, OH (2013)

Shanks, K., Behonick, G.S. and Terrell, A.R. Detection of Alpha-PVP in postmortem blood casework by UPLC/MS/MS, SOFT Annual Meeting, Orlando, FL (2013)

Okun, S., Behonick, G.S. and Tormos, L. Bismuth subsalicylate toxicity: Unexpected death due to an over-the-counter formulation. National Association of Medical Examiners Annual Meeting, P3, Milwaukee, WI (2013)

Shanks, K., Behonick, G.S. and Archuleta, P.A. Case reports: Fatalities associated with the synthetic cannabinoid AB-PINACA. SOFT Program and Abstracts, S36, Grand Rapids, MI (2014)

Shanks, K.G., Behonick, G.S., Jukes, E., and Shaker, A. Three fatalities associated with the synthetic cannabinoid AB-CHMINACA, SOFT Program and Abstracts, S30, Atlanta, GA (2015)

Shanks, K. and Behonick, G.,The ever changing scope of synthetic cannabinoids in toxicology casework (2011-2015), SOFT Program and Abstracts, Dallas, TX (2016)

Shanks, K. and Behonick, G., The elephant (tranquilizer) in the room [carfentanil]. SOFT/TIAFT Program and Abstracts, Boca Raton, FL (2018)

Abstracts/Poster Presentations (Cont.)

Shanks, K. and Behonick, G., Detection of the synthetic cannabinoid 5F-ADB in postmortem toxicology, Midwest Association for Toxicology and Therapeutic Drug Monitoring, Indianapolis, IN (April 2018)

Pisek, D. and Behonick, G., Qualitative screening of 28 analytes in postmortem urine using supported liquid extraction (SLE) and LC-MS/MS, Midwest Association for Toxicology and Therapeutic Drug Monitoring, Indianapolis, IN (April 2018)

Zagrocki, A. and Behonick, G., Conversion of six HPLC methodologies to a single rapid UPLC-MS/MS analysis, Midwest Association for Toxicology and Therapeutic Drug Monitoring, Indianapolis, IN (April 2018)

Shanks, K., Behonick, G. and Mannix, L., Fentanyl analogs in Butler County, Ohio (2016-2018), Midwest Association for Toxicology and Therapeutic Drug Monitoring, Cleveland, OH (April 2019)

Shanks, K., Behonick, G. and Mannix, L., A snapshot of fentanyl analogs and designer opioids: Butler County, Ohio (2016-2018), SOFT Program and Abstracts, San Antonio, TX (October 2019)

Behonick, G.S., Shanks, K.G. and Tormos, L.M. The detection of kavain in powder: death scene evidence and postmortem blood analysis. Proceedings American Academy of Forensic Sciences Annual 73rd Meeting (Virtual), K49, p. 787 February 2021

Shanks, K., Behonick, G. and Mannix, L. Emergence of the novel opioid metonitazene in postmortem toxicology and detection by LC-QToF-MS and LC-MS/MS, SOFT Annual Meeting, Nashville, TN (September 2021)

Shanks, K. and Behonick, G. The ever-changing scope of synthetic cannabinoids in toxicology casework II (2016-2020), SOFT Annual Meeting, Nashville, TN (September 2021)

Shanks, K. Behonick, G. and Ralston, W. Postmortem toxicology in Kentucky: looking back at 2020, SOFT Annual Meeting, Nashville, TN (September 2021)

Behonick, G.S., Wang, Z., Shanks, K.G. and Frey, M.D., Case report: detection of novel psychoactive substances in the context of fentanyl and heroin use. National Association of Medical Examiners Meeting, P35, West Palm Beach, FL (2021)

ORAL PLATFORM PRESENTATIONS/LECTURES-19

Fatty acid ethyl esters in Long Evans rats after acute and chronic ingestion of ethanol. SOFT 27th Annual Meeting, Salt Lake City, UT (1997)

Till death do us part: Fentanyl poisoning in a husband and wife, Joint SOFT/TIAFT Meeting, Washington, DC (2004)

Opioid mortality in southwestern Virginia. SOFT 35th Annual Meeting, Nashville, TN (2005)

CSI: Southwest Virginia (No, not really, just forensic toxicology!) Forensic entomology symposium, Entomological Society of America-Eastern Branch, 77th Annual Meeting, Charlottesville, VA (2006)

Forensic Toxicology Laboratory Response Network-C Conference, MDPH State Laboratory Institute & Centers of Disease Control and Prevention, Boston, MA (2007)

ORAL PLATFORM PRESENTATIONS/LECTURES (Cont.)

Toxicology and National Association of Medical Examiners' recommendations in manner of death classifications in suicide. SOFT 37th Annual Meeting, Durham, NC (2007)

Two fatal case reports of oxymorphone occurring in Massachusetts and Virginia . SOFT 38 th Annual Meeting, Phoenix, AZ (2008)

Forensic toxicology. Boston University School of Medicine Forensic Science Program, Boston, MA (2008)

Toxicology and National Association of Medical Examiners' recommendations in manner of death classifications in suicide. Massachusetts Department of Public Health, Boston, MA (2008)

K2/Spice, Bath Salts and Emerging Toxicology Trends in the Midwest, Iowa Association of County Medical Examiners Fall Meeting & Educational Expo, West Des Moines, IA (2012)

Forensic toxicology update lectures. Stark County, OH Coroner's Conference, Canton, OH (2012)

Cause of death-acute alcohol poisoning, manner of death-suicide: A case study. American Academy of Forensic Sciences 65th Annual Meeting, Washington, DC (2013)

Heroin: Awakening a sleeping giant. National Association of Medical Examiners' dinner presentation, Portland, OR (2014)

Dinner with a toxicologist: Musings and observations from a series of postmortem case studies. National Association of Medical Examiners' dinner presentation, Charlotte, NC (2015)

Case study: Alpha-PVP ("Flaaka") and excited delirium. Medical University of South Carolina Children's Hospital, Charleston , SC (2015)

Heroin epidemic issues. New York State Association of County Coroners and Medical Examiners, Fall 2016 Conference, Ellicottville, NY

Heroin: Awakening a sleeping giant. Midwest Association for Toxicology and Therapeutic Drug Monitoring (MATT), Indianapolis, IN (April 2018)

Elephants on parade: Carfentanil and other fentanyl analogs. The Ohio State Coroners Association 73rd Educational Conference, Cincinnati, OH (May 2018)

The detection of kavain in powder: death scene evidence and postmortem blood analysis, K49, American Academy of Forensic Sciences Annual 73rd Meeting (Virtual), February 2021

Workshops Chaired/Invited Faculty

The Forensic Toxicological Aspects of Chemical Terrorism (Chair), SOFT Annual Meeting, Milwaukee, WI (2000)

Beyond the Numbers: An objective approach to forensic toxicological interpretation (Presenter/Faculty), *The Role of Tolerance in Toxicological Interpretation.* American Academy of Forensic Sciences 65th Annual Meeting (Workshop #6), Washington, DC (2013)

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KEVIN G. SHANKS, MS, D-ABFT-FT

Axis Forensic Toxicology / Indianapolis, IN
(317) 715 - 0448
kshanks@axisfortox.com

EDUCATION AND CERTIFICATION

American Board of Forensic Toxicology *2012*
Diplomate of the ABFT – Forensic Toxicology (D-ABFT-FT)
1285, Requalified: December 2017, Requalification in December 2022

Master of Science, Forensic Toxicology (Veterinary Medical Sciences) *2011*
University of Florida, Gainesville, FL

Bachelor of Arts, Biology *2003*
Franklin College, Franklin, IN

PROFESSIONAL EXPERIENCE

Axis Forensic Toxicology, Indianapolis, Indiana

- *Forensic Toxicologist* *2016 – Present*

American Institute of Toxicology (AIT Laboratories), Indianapolis, Indiana

- *Forensic Toxicologist* *2011 – 2016*
- *Assistant Technical Director, Research and Development / Technical Services* *2010 – 2011*
- *Department Manager, Mass Spectrometry Screening / Trace Analysis* *2009 – 2010*
- *Department Manager, Forensics Department* *2008 – 2009*
- *Senior Chemist, Research and Development* *2005 – 2008*
- *Analytical Chemist, Research and Development* *2003 – 2005*

Professional Affiliations

Society of Forensic Toxicologists (SOFT) – Full Member *2008 – Present*

SOFT Postmortem Toxicology Committee *2021 – Present*

SOFT NPS / Designer Drugs Committee *2017 – Present*

SOFT Young Forensic Toxicologists Committee *2014 – 2021*

YFT Past Chair *2021*

YFT Chair *2020*

YFT Vice-Chair *2019*

YFT Secretary *2018*

SOFT ToxTalk "From the Toxicology Literature" editor *2015 – Present*

American Academy of Forensic Sciences (AAFS) – Associate Member (Toxicology Section) *2018 – Present*

American Academy of Clinical Toxicology (AACT) *2015 – 2017*

Midwest Association for Toxicology and Therapeutic Drug Monitoring (MATT) – Member *2013*

Advisory Committee for the Evaluation of Controlled Substance Analogs (Co-Chair) *2012 – 2014*
Toxicology and Pharmacology subcommittee (Chair)

Teaching Experience

"Toxicology of Designer Drugs". FIS49600. Indiana University – Purdue University – Indianapolis. Department of Chemistry. Forensic and Investigative Sciences Program. 2019.

"Toxicology of Designer Drugs". FIS49600. Indiana University – Purdue University – Indianapolis. Department of Chemistry. Forensic and Investigative Sciences Program. 2017.

Science Communication

Axis Forensic Toxicology Blog. Content Creator. https://axisfortox.com/blog/. 2021 – Present.

The Dose Makes the Poison: The Toxcast. Podcast. Creator, editor, producer, and host. https://anchor.fm/the-dose-makes-the-poison-cast. 2019 – Present.

Academic Research Projects

The Effects of Acquisition of Blood Specimens on Drug Levels and the Effects of Transportation Conditions on Degradation of Drugs. J. McLemore, E.W. Schwilke, K. Shanks, D. Klein. 244230, 2010-DN-BX-K216. U.S. Department of Justice.

Publications

"Two Single-Drug Fatal Intoxications by Mitragynine". G.S. Behonick, C. Vu, L. Czarnecki, M. El-Ters, K. Shanks. *J Anal Tox*, 46: e110-e114. (2022).

"Toxicological Drug Screening Using Paper Spray High-Resolution Tandem Mass Spectrometry (HR-MS/MS)". J. Mckenna, R. Jett, K. Shanks, N.E. Manicke. *J Anal Tox*, 42: 300-310. (2018).

"Three Cases of Fatal Acrylfentanyl Toxicity in the United States and a Review of the Literature", D.C. Butler, K. Shanks, G. Behonick, D. Smith, S.E. Presnell, L.M. Tormos. *J Anal Tox*, 42: e6-e11(2017).

"Detection of Carfentanil by LC-MS-MS and Reports of Associated Fatalities in the USA". K. Shanks, G. Behonick. *J Anal Tox*,41: 466-472. (2017)

"Carfentanil Identified in Two Driving Under the Influence of Drugs Cases". N.B. Tiscione and K. Shanks. ToxTalk, Society of Forensic Toxicologists, Inc. Vol. 40, No. 4, pp. 14-17 (2016).

"Rapid Screening and Identification of Novel Psychoactive Substances Using PaperSpray Interfaced to High Resolution Mass Spectrometry". J. Kennedy, K. Shanks, K. Van Natta, M.C. Prieto Conaway, J.M. Wiseman, B. Laughlin, M. Kozak. *Clin Mass Spectrometry*, 1, 3-10 (2016)

"Synthetic Cannabinoid Product Surveillance by LC/ToF in 2013-2015". K. Shanks, G. Behonick. *J Forensic Toxicol Pharmacol*, 4: 3 (2016)

"Death After Use of the Synthetic Cannabinoid 5F-AMB". K. Shanks, G. Behonick. *For Sci Int*, 262, e21-e24 (2016)

"Death Associated with the Use of the Synthetic Cannabinoid ADB-FUBINACA". K. Shanks, W. Clark, G. Behonick. *J Anal Tox*, 40: 3, 24-242 (2016)

"Fatal Intoxications with 25B-NBOMe and 25I-NBOMe in Indiana during 2014". K. Shanks, T. Sozio, G. Behonick. *J Anal Tox*, 39: 602-606 (2015)

"Case Reports of Synthetic Cannabinoid XLR-11 Associated Fatalities". K. Shanks, D. Winston, J. Heidingsfelder, G. Behonick. *For Sci Int*, 252, e6-e9 (2015)

"Four Postmortem Case Reports with Quantitative Detection of the Synthetic Cannabinoid, 5F-PB-22". G. Behonick, K. Shanks, D. Firchau, G. Mathur, C. Lynch, M. Nashelsky, D. Jaskierny, C. Meroueh. *J Anal Tox*, 38, 559-562 (2014)

"A Guide for the Interpretation of Postmortem Methamphetamine Findings: A Series of Case Reports". K. Quigley, K. Shanks, G. Behonick, A. Terrell. *J Forensic Toxicol Pharmacol*, 3:2 Doi: 10.4172/2325-9841.1000117 (2014)

"Identification of Novel Third Generation Synthetic Cannabinoids in Products by Ultra Performance Liquid Chromatography and Time of Flight Mass Spectrometry". K. Shanks, T. Dahn, G. Behonick, A. Terrell. *J Anal Tox,* 37: 517-525 (2013)

"Detection of Synthetic Cannabinoids and Synthetic Stimulants in First- and Second-Generation Legal Highs by Ultra Performance Liquid Chromatography with Time of Flight Mass Spectrometry (UPLC/ToF)". K. Shanks, T. Dahn, G. Behonick, A. Terrell. *J Anal Tox,* 36: 360-371 (2012)

"Detection of JWH-018 and JWH-073 by UPLC/MS/MS in postmortem whole blood casework". K. Shanks, T. Dahn, A. Terrell.. *J Anal Tox,* 36: 145-152 (2012)

"New Drug: metachlorophenylpiperazine (mCPP)". K. Shanks. ToxTalk. Society of Forensic Toxicologists, Inc. Vol 35, No. 1, p. 21-22.

"New 'Old' Drug: Rocuronium (Zemuron)". K. Shanks. ToxTalk. Society of Forensic Toxicologists, Inc. Vol. 34, No. 2, p. 15-17.

"Evaluation of a LC/MS Method to Screen for Drugs in Postmortem Whole Blood Specimens". K. Shanks, T. Dahn, A. Terrell, J. Bohuslavek – Waters Corporation Application Note, 720002113EN, Milford, MA, 2007

Poster Presentations

"The Ever-Changing Scope of Synthetic Cannabinoids in Toxicology Casework II (2016 – 2020). K. Shanks, G. Behonick – Society of Forensic Toxicologists, Nashville, TN, 2021.

"Postmortem Toxicology in Kentucky: Looking Back at 2020". K. Shanks. G. Behonick, W. Ralston. – Society of Forensic Toxicologists, Nashville, TN, 2021.

"Case Report: Detection of Novel Psychoactive Drugs in the Context of Fentanyl and Heroin Use". G.S. Behonick, Z. Wang, K. Shanks, M.D. Frey. – National Association of Medical Examiners, West Palm Beach, FL, 2021.

"A Snapshot of Fentanyl Analogs and Designer Opioids: Butler County, Ohio (2016-2018)", K. Shanks, G. Behonick, L. Mannix – Society of Forensic Toxicologists, San Antonio, TX, 2019.

"Detection of Three Synthetic Cannabinoid Butanoic Acid Metabolites in Postmortem Blood by LC-MS/MS". K. Shanks, G. Behonick – Midwest Association of Toxicology and Therapeutic Drug Monitoring, Cleveland, OH, 2019.

"Detection of the Synthetic Cannabinoid, 5F-ADB, in Postmortem Toxicology", K. Shanks, G. Behonick – Midwest Association of Toxicology and Therapeutic Drug Monitoring, Indianapolis, IN, 2018.

"Analysis of AB-CHMINACA in Hair by Solid Phase Extraction and Liquid Chromatography-Tandem Mass Spectrometry", C. Soni, D. Engelhart, E.S. Lavins, K. Shanks, C.K. Naso-Kaspar, T.P. Gilson – Midwest Association of Toxicology and Therapeutic Drug Monitoring, Milwaukee, WI, 2016.

"Detection of Synthetic Cannabinoids in Two E-Cigarette Liquids", K. Shanks – Society of Forensic Toxicologists, Atlanta, GA, 2015

"Postmortem Tissue Distribution of AB-CHMINACA Following Lethal Intoxication Compared with AB-CHMINACA Concentrations in Impaired Drivers", E.S. Lavins, K. Shanks, D.E. Englehart, H.E. Schueler, D.A. Galita, A.D. McCollum, C.H. Soni, P.D. Boggs, D.E. Rohde, C.K Naso-Kaspar, S. Sofalvi, M. Hansbrough, C. Carroll-Pankhurst, T.P Gilson. – Society of Forensic Toxicologists, Atlanta, GA, 2015

"Rapid Screening and Identification of Designer Drugs in Powders or Plant Materials Using Paper Spray Ionization-Mass Spectrometry", J.H. Kennedy, K. Shanks, K. Van Natta, M.C. Prieto Conaway, B. Laughlin, J.M. Wiseman, M. Kozak – American Association for Mass Spectrometry, St. Louis, MO, 2015

"Evaluation of Postmortem Methamphetamine Concentrations: A Series of Case Studies", K.M. Kitts, G.S. Behonick, K. Shanks – American Academy of Forensic Sciences, Seattle, WA, 2014

"Detection of Alpha-PVP in Postmortem Blood Casework by UPLC/MS/MS", K. Shanks, G.S. Behonick, A.R. Terrell – Society of Forensic Toxicologists, Orlando, FL, 2013

"Case Report: Identification of 8-hydroxyquinoline Cannabinoids in Herbal Products", K. Shanks, G.S. Behonick, A.R. Terrell – Society of Forensic Toxicologists, Orlando, FL, 2013

"Evaluation of Postmortem Methamphetamine Concentrations", K. Kitts, G. Behonick, K. Shanks – Midwest Association of Forensic Scientists, Dayton, OH, 2013

"Death by 'Legal Psychedelic Phenethylamines': Postmortem Tissue Distribution of Desoxypipradrol (2-DPMP) and 4-chloro-2,5-dimethoxyamphetamine (DOC)", E.S. Lavins, M. Pietrangelo, K. Shanks, C. Cushman, S. Sofalvi, J. Felo, J.F. Wyman, T.P. Gilson - American Academy of Forensic Sciences, Washington D.C., 2013

"Methylenedioxypyrovalerone (MDPV) Postmortem Blood Concentrations: A Series of Suicide Case Reports", G.S. Behonick, K. Shanks, A.R. Terrell – American Academy of Forensic Sciences, Washington, D.C., 2013

"A Dual Quantitative/Qualitative Screening Analysis for 32 Antidepressants and Metabolites in Human Urine by UPLC/ToF". K. Shanks, T. Dahn, A. Terrell – Society of Forensic Toxicologists, Richmond, VA, 2010

"Analysis of Prilocaine in Postmortem Whole Blood and Vitreous Fluid Utilizing UPLC/ToF (Screening) and UPLC/MS/MS (Confirmation)" M. Klebs, K.Shanks, A. Terrell – Midwest Association of Forensic Science, Des Moines, IA, 2008

"A Rapid, General Unknown Screen in Blood by Ultra Performance Liquid Chromatography and Time of Flight Mass Spectrometry" K. Shanks, T. Dahn, M. Larson, A. Terrell – American Association of Clinical Chemistry, Washington, D.C., 2008

"Screening of Postmortem Specimens for Drugs of Abuse and Therapeutic Drugs by UPLC/ToF". K. Shanks, T. Dahn, M. Larson, A. Terrell, J. Bohuslavek – Society of Forensic Toxicologists, Raleigh-Durham, NC, 2007

"Quantitation of Seven Opioids in Urine Utilizing HPLC-MS/MS". T. Dahn, K. Shanks, A. Terrell, T. Sasaki – Society of Forensic Toxicologists, Austin, TX, 2006

"Evaluation of a LC/MS Method to Screen For Drugs in Postmortem Whole Blood Specimens". K. Shanks, T. Dahn, A. Terrell, J. Bohuslavek – Society of Forensic Toxicologists, Austin, TX, 2006

Oral Presentations

"Emergence of the Novel Opioid Metonitazene in Postmortem Toxicology and Detection by LC-QToF-MS and LC-MS/MS. K. Shanks, G. Behonick, L. Mannix. Society of Forensic Toxicologists, Nashville, TN, 2021.

"Synthetic Cannabinoid Receptor Agonists (2020-2021)". K. Shanks. London Toxicology Group (LTG) Virtual Meeting. 2021.

"Novel Psychoactive Substances: A Look at 2020". K. Shanks. Midwest Association for Toxicology and Therapeutic Drug Monitoring, Virtual Meeting, 2021.

"Detection of Kavain in Powder: Death Scene Evidence and Postmortem Blood Analysis". G. Behonick, K. Shanks, L. Tormos. American Academy of Forensic Scientists, 2021.

"Postmortem Toxicology in Kentucky: A Look Back At 2020". K. Shanks. Kentucky Coroner's Association Conference. Louisville, KY, 2021.

"Toxicology of Plant-Based Poisons: A Brief Survey of Analytical Methods and Case Reports". K. Shanks. Society of Forensic Toxicologists, San Antonio, TX, 2019.

"Fentanyl Analogs in Butler County, Ohio (2016-2018)". K. Shanks, G. Behonick, and L. Mannix. Midwest Association of Toxicology and Therapeutic Drug Monitoring, Cleveland, OH, 2019.

"Medical-Legal Death Investigation in the Age of Designer Opioids". K. Shanks. Michigan State University Pharmacology and Toxicology Seminar. Lansing, MI, 2019.

"Not So Fast, My Friends: Toxicological Detection of the Synthetic Cannabinoids, 5F-ADB and FUB-AMB". K. Shanks, G. Behonick. Society of Forensic Toxicologists, Minneapolis, MN, 2018.

"Medical-Legal Death Investigation in the Age of Designer Opioids". K. Shanks. Kentucky Coroner's Association Conference, Louisville, KY, 2018.

"The Elephant (Tranquilizer) in the Room" K. Shanks, G. Behonick. Society of Forensic Toxicologists, Boca Raton, FL, 2018.

"Not Your Father's Heroin: Forensic Toxicology in the Age of Fentanyl and Fentanyl Analogs". K. Shanks. Separation Science. Advances in Forensics and Toxicology eSeminar. 2017.

"LC/ToF Method Development and Validation" K. Shanks, Toxicology Method Development and Validation Workshop – Northern California, California Office of Traffic Safety, Rancho Cordova, CA. 2017.

"Fentanyl Analogs and Designer Opioids: To Go Where No One Has Gone Before." K. Shanks. Missouri Medical Examiner and Coroner's Training Conference, Jefferson City, MO, 2017.

"Not Your Father's Heroin: Fentanyl and Analogs", K. Shanks. Kentucky Coroner's Association Annual Training Meeting, Louisville, KY, 2017.

"Synthetic Cannabinoids: Here Today, Gone Tomorrow", K. Shanks. Midwest Association of Toxicology and Therapeutic Drug Monitoring (MATT) Annual Meeting, Rosemont, IL, 2017.

"LC/ToF Method Development and Validation" K. Shanks, Toxicology Method Development and Validation Workshop – Southern California, California Office of Traffic Safety, Santa Ana, CA. 2017.

"Postmortem Tissue Distribution of U47700 Following Lethal Intoxication and Novel Scheduling in the State of Ohio", E. Lavins, D.E. Rohde, K. Shanks, C.H. Soni, I.T. Brooker, E.C. Reed, J.J. Kucmanic, E.M. Worrell, L.E. Lemmerbrock, M.E. Fowler, J.A. Felo, A. McCollum, D.A. Englehart, H.E. Schueler, T.P. Gilson. American Academy of Forensic Sciences, New Orleans, LA, 2017.

"New Psychoactive Substances: Synthetic Cannabinoids to Fentanyl Analogs", K. Shanks, Illinois Coroner and Medical Examiner's Association, Peoria, IL, 2016.

Forensic Chemistry Reddit AMA (Ask Me Anything): American Chemical Society, National Chemistry Week, 2016. https://www.reddit.com/r/science/comments/583fbs/american_chemical_society_ama_hi_reddit_im_kevin/

"New Psychoactive Substances: Synthetic Cannabinoids to Fentanyl Analogs", K. Shanks, 33rd Annual Forensic Science Seminar, Minneapolis, MN, 2016.

"The Every Changing Scope of Synthetic Cannabinoids in Toxicology Casework (2011-2015)", K. Shanks, G. Behonick. Society of Forensic Toxicologists, Dallas, TX, 2016.

"The Current Heroin and Fentanyl Analog Epidemic: A Toxicological Perspective", K. Shanks, Medicolegal Death Investigator Training, Indiana Coroner's Association, Indianapolis, IN, 2016

"Toxicology: Trials and Tribulations" Robert Forney Jr., Joseph Jones, K. Shanks. Regional Drugged Driving Summit, AAA and the Ohio Department of Public Safety, Blue Ash, OH, 2016

"New Psychoactive Substances: From Synthetic Cannabinoids to Fentanyl Analogs", K. Shanks, Wyoming Coroner's Association. Coroner's Conference, Sheridan, WY, 2016

"An Introduction and Case Study Related to NBOMes", K. Shanks and T. Sozio, AIT Laboratories Webinar, Indianapolis, IN, 2016

"New Psychoactive Substances: The Present and the Future", K. Shanks, California Association of Toxicologists Conference, Lake Tahoe, NV, 2016

"Synthetic Cannabinoids: A Primer", K. Shanks, AIT Laboratories Webinar, Indianapolis, IN 2016

"Three Fatalities Associated with the Synthetic Cannabinoid AB-CHMINACA", K. Shanks, Society of Forensic Toxicologists, Atlanta, GA, 2015

"Instrumentation in the Forensic Toxicology Laboratory: Advantages and Disadvantages", K. Shanks – Society of Forensic Toxicologists, Atlanta, GA, 2015

"Deaths Associated With Synthetic Cannabinoids in the USA", K. Shanks – Florida Association of Medical Examiner's Annual Meeting, Daytona Beach, FL, 2015

"Postmortem Toxicology: Specimen Selection, Drug Trends, and The Future", K. Shanks – Kentucky Coroner's Association Annual Conference, Louisville, KY, 2015

"Detection of 6-EAPB, 6-MAPB, and 6-APB "Benzofury" Analogues in Postmortem Tissues", D. Baker, R. Yinger, N. Kelly, R. DeRienz, J. Hogue, K. Gerston, J. Gorniak, K. Shanks, S. Kacinko – The International Association of Forensic Toxicologists, Buenos Aires, Argentina, 2014

"Case Reports: Fatalities Associated with the Synthetic Cannabinoid, AB-PINACA", K. Shanks, G. Behonick, P. Archuleta, D. Jaskierny – Society of Forensic Toxicologists, Grand Rapids, MI, 2014

"Introduction to Forensic Toxicology", K. Shanks – Indiana Academy of Mathematics and Sciences, Muncie, IN, 2013

"Designer Drugs: From Product Surveillance to Forensic Casework", K. Shanks – Michigan Association of Medical Examiners' Conference, Mt. Pleasant, MI, 2013

"The Forensics of Drug Diversion and Synthetic Drugs", L. Waugh, A. Mock, K. Shanks – International Symposium on Safe Medicine, Charleston, WV, 2013

"Designer Drugs: Synthetic Cannabinoids, Stimulants, and Psychedelics". K. Shanks. American Academy of Family Physicians, Corporate Health Directors Network, Washington, D.C., 2013

"Cause of Death – Acute Alcohol Poisoning, Manner of Death – Suicide: A Case Study", G.S. Behonick, K. Shanks, R. Kulhanek, M.J. Witeck – American Academy of Forensic Sciences, Washington, D.C., 2013

"Scientific Method for Controlled Substance Analog Determination", L. Reinhold, H.L. Harris, D.E. Forrester, K.P.C. Minbiole, K. Shanks, J.R. Stenzel, J.G. Rankin – American Academy of Forensic Sciences, Washington, D.C., 2013

"K2, Bath Salts and Emerging Toxicology Trends in the Midwest", G. Behonick and K. Shanks – Iowa Association of County Medical Examiners' Fall Meeting and Education Expo, Des Moines, IA, 2012

"Designing Disaster: The History of the Designer Drug Movement, 1960s to Present". K. Shanks. Forensic Science Lecture Series. Indiana Medical History Museum, 2012

"Analytical Challenges of Synthetic Cannabinoids". K. Shanks. Pharmacology Workshop. Midwest Association of Forensic Scientists, Milwaukee, WI, 2012

"Drug Facilitated Sexual Assault". K. Shanks. St. Franciscan Sexual Assault Nurse Examiners (SANE) training. 2012.

"New Designer Drugs – Synthetic Cannabinoids and Synthetic Stimulants". K. Shanks. Indiana Coroner's Association, Coroner's Conference, Merillville, IN, 2012

"New Designer Drugs – Synthetic Cannabinoids and Synthetic Stimulants". K. Shanks. Colorado Coroner's Association, Coroner's Conference, Pueblo, CO, 2012

"New Designer Drugs – Synthetic Cannabinoids and Synthetic Stimulants". K. Shanks. Wyoming Coroner's Association, Coroner's Conference, Sheridan, WY, 2012

"Drug Facilitated Sexual Assault". K. Shanks. St. Franciscan Sexual Assault Nurse Examiners (SANE) training. 2011.

"New Designer Drugs – Synthetic Cannabinoids and Synthetic Stimulants". K. Shanks. Kentucky Coroner's Association, Drug Death Investigation Course, Lake Barkley, KY, 2011

"General Unknown Screening Using ToF-MS: A Reference Lab Perspective". K. Shanks. The Association for Mass Spectrometry: Applications to the Clinical Laboratory, San Diego, CA, 2011

"Nonroutine Case Studies in Forensic Toxicology". T. Dahn, K. Shanks - Butler University, Indianapolis, IN. Chemistry Seminar, 2010

"UPLC/MS Applications in Forensic Toxicology". K. Shanks – Midwest Association of Forensic Scientists, Des Moines, IA, 2008

"UPLC and Time of Flight Mass Spectrometry for Unknown Screening in Forensic Toxicology". K. Shanks – Waters UPLC Symposium, Indianapolis, IN, 2007

Continuing Education and Other Attended Workshops

Vaping: It's Not Just Nicotine – Potential Impacts to Your Forensic Toxicology, Society of Forensic Toxicologists Annual Conference, Nashville, TN, 2021.

Strategies for Screening of NPS in Forensic Toxicology, Society of Forensic Toxicologists Annual Conference, Nashville, TN, 2021.

Poisons: When Everything Old Isn't New and When Everything New Isn't Old, Society of Forensic Toxicologists Annual Conference, Nashville, TN, 2021.

Benzodiazepines for Dummies…And Smarties, Too! Society of Forensic Toxicologists Annual Conference, San Antonio, TX, 2019.

Driving Under the Influence: The NPS Edition. Society of Forensic Toxicologists Annual Conference, San Antonio, TX, 2019.
The Basics, Mechanisms, and Drugs Involved in Cardiotoxicity. Society of Forensic Toxicologists Annual Conference, San Antonio, TX, 2019.

Poisonous Plants: Pharmacology, Toxicology, and Murder! Society of Forensic Toxicologists Annual Conference, San Antonio, TX, 2019

How to Navigate Your Way through the Epidemic of Emerging Drugs. Society of Forensic Toxicologists Annual Conference, Minneapolis, MN, 2018.

How Do I Analyze For That? Society of Forensic Toxicologists Annual Conference, Minneapolis, MN, 2018.

From the Street to the Lab: Updated Trends and Case Reports for Novel Psychoactive Substances. Society of Forensic Toxicologists Annual Conference, Boca Raton, FL, 2018.

Strategies for the Detection of Synthetic Cannabinoids in Biological Specimens. Society of Forensic Toxicologists Annual Conference, Boca Raton, FL, 2018.

Different Approaches to Evaluate the Prevalence of NPS. Society of Forensic Toxicologists Annual Conference, Boca Raton, FL, 2018.

Alcohol Concentration Extrapolation, Society of Forensic Toxicologists Annual Conference, Dallas, TX, 2016

Toxicology of Designer Benzodiazepines and Opioids, Society of Forensic Toxicologists Annual Conference, Dallas, TX, 2016

Is This What The Doctor Ordered? Medical Marijuana Update, Society of Forensic Toxicologists Annual Conference, Dallas, TX, 2016

Postmortem Cannabinoids: Issues of Analysis and Interpretation, Society of Forensic Toxicologists Annual Conference, Dallas, TX, 2016

Pharmacognosy for the Forensic Toxicologist, Society of Forensic Toxicologists Annual Conference, Atlanta, GA, 2105

Pharmacology and Toxicology of Synthetic Cathinones and Phenylethylamines, Society of Forensic Toxicologists Annual Confererence, Atlanta, GA, 2015

Public Health Challenge of Synthetic Cannabinoids, Symposium, NMS Labs, Philadelphia, PA, 2015

A Pharmacogenomics Primer with Applications to Forensic Toxicology, Society of Forensic Toxicologists Annual Conference, Grand Rapids, MI, 2014

Get Excited about Stimulants, Society of Forensic Toxicologists Annual Conference, Grand Rapids, MI, 2014

Synthetic Cannabinoids – Evolution 2014, Society of Forensic Toxicologists Annual Conference, Grand Rapids, MI, 2014

Pharmacology and Toxicology of Synthetic Cannabinoids. Society of Forensic Toxicologists Annual Conference, Orlando, FL, 2013

Marijuana: Old Drug, New Data. Society of Forensic Toxicologists Annual Conference, Orlando, FL, 2013

High Profile Cases in Toxicology – Lessons Learned. Society of Forensic Toxicologists Annual Conference, Orlando, FL, 2013

Ethanol Facilitated Sexual Assault. Society of Forensic Toxicologists Annual Conference, Orlando, FL, 2013

High Profile Cases in Toxicology. Society of Forensic Toxicologists Annual Conference, Orlando, FL, 2013

Opioids: 21st Century Killers. Society of Forensic Toxicologists Annual Conference, Boston, MA, 2012

Use of Pharmacogenetics in Personalized Pain Management. Society of Forensic Toxicologists Annual Conference, Richmond, VA, 2010

DFSA Applications and Interpretations. Society of Forensic Toxicologists Annual Conference, Richmond, VA, 2010

A Stroll through the Cannabinoid Field: Pharmacology, Therapeutics, and Untoward Effects. Society of Forensic Toxicologists Annual Conference, Richmond, VA, 2010

LCT Premier Operation Training Course, Small Molecule Applications, Waters Corporation, Milford, MA, 2008

LC/MS in the 21st Century. Society of Forensic Toxicologists Annual Conference, Raleigh-Durham, NC, 2007

Benzodiazepines, The Basics and Beyond. Society of Forensic Toxicologists Annual Conference, Raleigh-Durham, NC, 2007

The Application of Hair as an Alternative Matrix for Forensic Applications. Society of Forensic Toxicologists Annual Conference, Austin, TX, 2006

Method Validation and Measurement Uncertainty for Dummies…And Smarties Too. Society of Forensic Toxicologists Annual Conference, Austin, TX, 2006

Alliance Operation and Performance Maintenance, Waters Corporation, Milford, MA, 2005

Stuart A. K. Kurtz
(765)-413-6453
kurtzstu@gmail.com

Stuart A. K. Kurtz

9440 Benchview Drive H, Indianapolis, IN 46240
(765)-413-6453 | kurtzstu@gmail.com | linkedin.com/in/stuartkurtz

Education

Indiana University Purdue University at Indianapolis – Indianapolis, IN
MS, Forensic Chemistry - Forensic Chemistry Concentration *Graduated August 2018*

Goshen College – Goshen, IN
BA, Chemistry *Graduated May 2017*

West Lafayette Jr/Sr High School – West Lafayette, IN
CORE 40 Academic Honors Diploma *Graduated May 2013*

Experience

Axis Forensic Toxicology – Indianapolis, IN
Forensic Toxicologist *January 2022 – Present*

- Case review & release, expert witness testimony, method development for New Psychoactive Substances

Forensic Analytical Chemist II *March 2020 – January 2022*

- Duties of Analytical Chemist I, peer review of data analysis

Forensic Analytical Chemist I *July 2018 – March 2020*

- Instrument maintenance & troubleshooting, data analysis, assisted on projects

Goshen College Chemistry Department – Goshen, IN
Teaching Assistant *August 2016 – April 2017*

- Supervision, lab setup, and clean up for lab sections

Goshen College Chemistry Department – Goshen, IN
Research Assistant *August 2014 – December 2016*

- Worked on Pigmentation Genetics of Domestic Pigeons project

Skills

Laboratory Techniques	Works Daily With GC-FID, GC-MS, UPLC-MS/MS, HPLC-QToF Theoretical Knowledge of Extractions: Protein Precipitation, Liquid-Liquid, Supported Liquid, Solid Phase
Public Speaking	Goshen College Science Speaker Series, Maple Scholars, Indiana Academy of Science, Expert Witness Preparation
Computer	Microsoft Word, Microsoft Excel, SciExOS MassLynx, Analyst, ChemStation, Apollo LIMS

MATTHEW ZOLLMAN

KATHERINE ALEXANDER

MARCIE LARSON

MATTHEW ZOLLMAN

14621 Balfour Road • Fishers, IN 46037 • 317-645-6508 • mandcz@att.net

Personal Summary

A dedicated management professional focused on quality, efficiency, and employee development. Passion for surpassing financial and service objectives by solving operational problems and maximizing resource utilization.

Key Skills

Project Development & Implementation
Budgeting & Forecasting
Team-building & Supervision
Troubleshooting & Problem Solving
Managing within Regulated Environment
Vendor & Service Relations
Goal Setting & Achievement
Relationship Building

Experience

Axis Forensic Toxicology, Indianapolis, IN 2016 to present

Director of Operations & Product Management, July 2016 to Current

AIT Laboratories, Indianapolis, IN 2008 to 2016

Director, Lab Operations, December 2013 to Current

Led all operation functions for multiple product lines and 60-80 FTE's across multiple shifts in a highly regulated laboratory environment (CAP/CLIA, ISO 9001:2008, American Board of Forensic Toxicology) with more than $35MM annual revenue and $4.2MM annual budget responsibility

Results:

- Reduced overall annual lab COGS by 5% by reducing reference lab costs by 60%
- Implemented modified cycle time, reducing annual COGS by 10%
- Developed dedicated product line for highly regulated state work and expedited STAT samples
- Partnered with vendor management company to reduce inventory costs by 20%
- Developed plan to reduce annual COGS by 10% through process consolidation and automation
- Implemented automated data analysis software for LC/MS-MS instrumentation

Operations Manager, Lab Operations, April 2013 to November 2013

- Established first quantifiable monthly metric system for employee performance, increasing efficiency levels by average of 10%

Operations Manager, Forensic Business Unit, April 2011 to April 2013

- Led production chain from receipt of sample to report and 23 FTE's across 3 shifts in highly regulated laboratory environment with $4MM annual revenue

Results:

- Reduced annual COGS by 26%
- Reduced receipt to report turn-around time by 34%
- Increased quality levels by 30% through reduction of client impacting corrective actions
- Increased monthly throughput capacity by 27%

Quality Control Manager, January 2009 to April 2011
Quality Control Team Lead, June 2008 to January 2009
Quality Control Chemist, January 2008 to June 2008

Education

Butler University – ***Masters of Business Administration, Concentration: Finance*** 2011

Purdue University – ***Bachelor of Science, Biology*** 2007

KATHERINE H. ALEXANDER

katherine.a.hopkins@gmail.com (708)764-2086
16222 Sedalia Drive, Fishers, IN 46040

EXPERIENCE

Axis Forensic Toxicology, Indianapolis, IN
Operations Manager, Lab June 2016 – Present

- Coordinate workflow and daily operations to ensure client expectations are met and labor costs conserved
- Organized and performed validation studies to include Meconium specimens into current testing methodology
- Facilitated transition of AIT Laboratories to Axis Forensic Toxicology
- Coordinated movement of laboratory equipment, furniture, and samples from previous to the new facility

American Institute of Toxicology (AIT Laboratories), Indianapolis, IN
Operations Manager, Compliance Lab Sept 2015 – June 2016

- Design and execute predictive studies to estimate savings/impact; develop tracking methods to ensure that process improvement can be measured and analyzed against the estimated improvement
- Improved inventory management procurement to save an estimated $60,000 annually

Supervisor, Compliance Lab (Specimen Receipt through Client Reporting) Feb 2013 – Sept 2015

- Facilitated successful combination of six departments within the production laboratory to increase efficiency of throughput, align employee objectives, and focus decision making efforts
- Integrated an automated analysis program to replace an analysis step for a savings of $60,000 annually; Validated analysis methods to produce results within 1% difference of the previous manual method
- Improved on-time delivery of results from 80% to 99% by implementing a new Priority Batch Process
- Proposed and implemented a three day turnaround time for $500,000 in annual savings

Supervisor, Specimen Processing Nov 2011 – Feb 2013

- Designed a layout of equipment to establish effective conveyance using 6 Sigma, LEAN, and 5S principles
- Generated and implemented cost-saving initiatives and process improvements to reduce Specimen Receipt Cost of Goods Sold by 13%

Chemist I, Aliquotting & Extractions June 2010 – Nov 2011

CERTIFICATIONS

QAI – Training For Quality, Indianapolis, IN Sept 2012
Six Sigma Certification, Yellow Belt

SKILLS AND COMPETENCIES

- Project Management
- Cost Analysis
- Problem Solving
- Pivot Tables
- Inventory Management
- Waste Identification
- 5S Strategies
- Process/Business Modelling
- Business Cases
- Value Stream Mapping
- Training the Trainer
- Business Consulting

EDUCATION

Indiana University, Bloomington, IN May 2010
Bachelor of Science in Public Affairs, Environmental Management
Major GPA 3.5/4.0, Cumulative GPA 3.3/4.0

Butler University, Indianapolis, IN August 2018
Master of Business Administration, Finance
Cumulative GPA 3.7

AWARDS/ACTIVITIES

MBA Association, *VP of Finance and Treasurer, previously At-Large Member* 2016 – 2018
Global Business Consulting Project, *Consultant,* Czech Republic, Lyra Chocolate 2017
ACG Case Study Cup Winner, *Member of the Butler University Team* 2017
Volunteer of the Year Award, IU School of Public and Environmental Affairs 2009
Indiana University Varsity Track & Field Team, *Pole Vaulter* 2006 – 2008
IU Faculty Award Recipient, *$32,000 in academic scholarship funding* 2006

219 W. North St., Lebanon, IN 46052

Marcie Larson

Profile

I have a Bachelor's of Science in Chemistry, am trained to perform various types of extractions, method development, and data analysis. I am also trained to operate, maintain, and repair a variety of instrumentation. I have several years of experience leading peers and managing a team/department.

Employment History

Axis Forensic Toxicology,
Indianapolis, IN
03/2018 - Present

Technical Manager, Laboratory

- Determining strategic direction for laboratory instrumentation
- Managing and reviewing laboratory personnel
- Monitoring instrumentation performance and quality
- Performing all previous duties under Axis Forensic Toxicology Technical and Instrument Specialist, Supervisor

Axis Forensic Toxicology,
Indianapolis, IN
07/2016 – 03/2018

Technical & Instrument Specialist, Supervisor

- Evaluated the quality of departmental personnel and methods
- Performing repair and troubleshooting on all laboratory instrumentation
- Coordinating with outside service personnel for repairs or preventative maintenance protocols
- Maintaining and implementing changes within the LIS for updates to software or product offerings
- Completed projects to improve departmental efficiency and costs
- Completed the implementation of new product offerings
- Coordinated and managed testing of materials from other submitting agencies
- Analyze confirmatory tests for pharmaceutical and illicit drugs using MassLynx, Ascent, Analyst, Empower, and Chemstation software
- Verification and release of confirmatory test results
- Trained laboratory personnel in developed methods for departmental cross-training
- Performed method development and validation as needed on new and previously existing panel drugs
- Operated a Waters Quattro Premier XE equipped with a Waters Acquity UPLC
- Operated a Waters TQ Detector LC/MS/MS equipped with a Waters Acquity UPLC
- Operated a Hewlett Packard Series II 5890 GC/FID equipped with a CTC Combi-PAL or Gerstel MPS2 Autosampler
- Operated an Applied Biosystems 3200/QTRAP equipped with a Waters Acquity UPLC
- Operated a Waters 2487 Dual Wavelength Detector equipped with a Waters 2695 Allaince HPLC
- Operated a Waters 2475 UV Florescence Detector equipped with a Waters 2695 Allaince HPLC
- Operated an Agilent 6890/5873 GCMS equipped with an Agilent 7683 Autosampler

AIT Laboratories,
Indianapolis, IN
10/2013 – 7/2016

Forensics Supervisor – Forensics Business Unit

- Managed daily workflow within the department
- Evaluated the quality of departmental personnel

- Completed projects to improve departmental efficiency and costs
- Completed the implementation of new product offerings
- Coordinated and managed testing of materials from other submitting agencies
- Analyze confirmatory tests for pharmaceutical and illicit drugs using MassLynx, Analyst, and Chemstation software
- Verification and release of confirmatory test results
- Trained laboratory personnel in developed methods for departmental cross-training
- Operated a Waters Quattro Premier XE equipped with a Waters Acquity UPLC
- Operated a Waters TQ Detector LC/MS/MS equipped with a Waters Acquity UPLC
- Operated a Hewlett Packard Series II 5890 GC/FID

AIT Laboratories,
Indianapolis, IN
03/2009 – 10/2013

Analytical Chemist I & II - Forensic Confirmations & Certification - Team Lead (06/2011)

- Monitored and organized workflow
- Analyze confirmatory tests for pharmaceutical and illicit drugs using MassLynx, Analyst, and Chemstation software
- Verification and release of confirmatory test results
- Trained laboratory personnel in developed methods for departmental cross-training
- Operated a Waters Quattro Premier XE equipped with a Waters Acquity UPLC
- Operated a Waters TQ Detector LC/MS/MS equipped with a Waters Acquity UPLC
- Operated a Hewlett Packard Series II 5890 GC/FID

AIT Laboratories,
Indianapolis, IN
05/2007 – 03/2009

Analytical Chemist – Research & Development/Forensics

- Performed trace analysis and/or unknown identification on various pill, tablets, capsules, syringes, powders, and liquids
- Participated in a Phase II Clinical trial of Flurbiprofen by performing extractions and data analysis
- Performed method development and validation as needed on new and previously existing panel drugs
- Trained laboratory personnel in developed methods for integration into the Production Laboratory
- Used MassLynx and Analyst software for data analysis
- Operated a Waters Quattro Premier XE equipped with a Waters Acquity UPLC
- Operated a Waters Quattro Micro LC/MS/MS equipped with a Waters Alliance 2965 HPLC
- Operated a Waters TQ Detector LC/MS/MS equipped with a Waters Acquity UPLC
- Operated an Applied Biosystems 3200 Q Trap equipped with a Cohesive Technologies Agilent 1200 series pump
- Operated a Waters LCT Premier equipped with a Waters Acquity UPLC
-

AIT Laboratories,
Indianapolis, IN
05/2006 – 08/2006

Intern – Research & Development

- Developed and validated an LC/MS/MS method for the quantitation of Buprenorphine and Norbuprenorphine in urine specimens
- Developed and validated an LC/MS/MS method for the quantitation of Ethyl Glucuronide in urine specimens

- Developed and validated an LC/MS method for the quantitation of Duloxetine in whole blood, serum, plasma, and vitreous specimens
- Developed and validated an LC/MS/MS method for the quantitation of Tricylics, Fluoxetine, Clomipramine, and Paroxetine in whole blood, serum, plasma, and vitreous specimens
- Performed other method development and validations as needed
- Trained laboratory personnel in developed methods for integration into the Production Laboratory
- Used MassLynx and Analyst software for data analysis
- Presented "Buprenorphine" (American Institute of Toxicology Laboratories, 8/2006)
- Operated a Waters Quattro Micro LC/MS/MS equipped with a Waters Alliance 2965 HPLC
- Operated an Applied Biosystems 3200 Q Trap equipped with a Cohesive Technologies Agilent 1200 series pump
- Operated an Applied Biosystems 3200 Q Trap equipped with an Agilent 1200 series pump

AIT Laboratories,
Indianapolis, IN
05/2005 – 08/2005

Intern – Screening, Extractions, and Data Analysis

- Developed and validated an GC/MS and solid phase extraction method for the quantitation of Cocaine and Benzoylecgonine in urine specimens
- Partially developed and validated a GC/MS and solid phase extraction method for the quantitation of THC and THC- Carboxy in urine specimens
- Performed routine data analysis
- Performed routine solid phase and liquid-liquid extractions for pharmaceutical drugs
- Operated a Dynex Technologies DSX Automated ELISA System
- Operated Cerex Pressure Processor System 48

Education

Saint Joseph's College
Rensselaer, IN
05/2007

Bachelor's of Science – Chemistry
Bachelor's of Arts - History

Professional Accomplishments

Clinical Toxicology

- Presented "A UPLC-MS/MS Method for Analyzing Eight Drugs: A Sixty Percent Reduction in Runtime vs. HPLC-MS/MS" (poster presentation) at "AACC Annual Meeting and Clinical Laboratory Expo" – 7/2008

Continuing Education

- Attended a class in Indianapolis, IN – "GC/MS Operator Training Review" – presented by Terra Technologies, Inc. (6/2007)
- Attended a class in Beverly, MA – "Quattro Premier Operation Training Course" – presented by Waters (6/2007)
- Attended an audio conference in Indianapolis, IN – "Good Laboratory Practice Regulations" – presented by Ludwig Huber (8/2007)
- Attended a symposium – "Waters UPLC Symposium 2007" – presented by Waters (11/2007)
- Attended a web seminar – "HPLC Troubleshooting, Part 1 of 3" – presented by Waters and AIT Laboratories (12/2007)

- Attended a web seminar – "HPLC Troubleshooting, Part 2 of 3" – presented by Waters and AIT Laboratories (4/2008)
- Attend a conference in Washington, D.C. – "AACC Annual Meeting and Clinical Laboratory Expo" – presented by the American Association of Clinical Chemistry (7/2008)
- Attended a class in Washington, D.C. – "The Changing Pharmaceutical Industry" – presented by Roy Vagelos and AACC (7/2008)
- Attended a "brown bag session" in Washington, D.C. – "How People Try to Beat Drug Testing and Defend Positive Results" – presented by Amitava Dagupta and AACC (7/2008)
- Attended a workshop in Washington, D.C. – "Utilization of Toxicology Laboratory Services for Optimal Patient Care" – presented by Bill Clarke, Judy Stone, Gwen McMillin, Andrea Terrell, and AACC (7/2008)
- Attended a workshop in Washington, D.C. – "MassTrak LC/MS Solutions for the Clinical Laboratory" – presented by Waters (7/2008)
    - Featuring:
        - "Subtleties of Matrix Effects in LC/MS" – Thomas Annesley
        - "An Introduction to the MassTrak Amino Acid Analysis Solution for Clinical Research" – Kendon Graham
        - "Problems with Vitamin D Analysis: Is LC/MS/MS the Solution?" – A.M. Wallace
        - "Accurate and Rapid Detection of Clozapine, Oxycodone and Their Metabolites Using Tandem Mass Spectroscopy" – L.V. Rao
- Attended an online course – "Best Practices for Volumetric Measurements" – presented by Jeri D. Ropero-Miller and Research Triangle Institute (RTI) (12/2008) in association with the American Association of Clinical Chemistry (AACC)
    - Received one ACCENT Contact Hour
- Attended an online course – "Opioids and Pain Management" – presented by James Ruth, Ph.D., D-ABFT and Research Triangle Institute (RTI) (12/2008) in association with the American Association of Clinical Chemistry (AACC)
    - Received one ACCENT Contact Hour
- Attended a continuing education program in Indianapolis, IN – "Homicide Investigation: From Crime Scene to Court" – sponsored by the Central Indiana Chapter of the Indiana University Alumni Association and the alumni associations of Continuing Studies, Law-Indianapolis, Medicine, Liberal Arts, Public and Environmental Affairs, and Science (3/2009)
    - Featuring:
        - "U.S. Homicide Trends" – Kenna Quinet
        - "Sociological Explanation of Homicide" – Wan-Ning Bao
        - "'Nuts and Bolts' of Crime Scene Investigation" – Mike Crooke, Sgt. John Kelley, John Pless, M.D.
        - "Evidence Collection and Analysis" – Carl Sobieralski, Marta Alfonso, John Goodpaster
        - "Evidence in the Courtroom" – Sonia Leerkamp, Hon. Lisa Borges, Frances Lee Watson
    - Received 4.5 hours of continuing education
- Attended an internal development course in Indianapolis, IN – "AIT Case Studies" – presented by Gene Schwilke, Ph.D. (3/2011)
- Attended an internal development course in Indianapolis, IN – "Value Stream Mapping" – presented by Jason Bush, Ph.D. (4/2011)
- Attended an internal development course in Indianapolis, IN – "New Designer Drugs – Synthetic Cannabinoids (K2/Spice)" - presented by Kevin Shanks, MS. (5/2011)
- Attended an internal development course in Indianapolis, IN – "CVENT Hands on Training" – presented by Justin Taylor. (2/2012)
- Attended an internal development course in Indianapolis, IN – "Problem Solving –

Fishbone Diagrams" – presented by Cory Maryan. (3/2012)
- Attended an internal development course in Indianapolis, IN – "Pivot Tables" – presented by Erin Lenarz. (4/2012)
- Attended an internal development course in Indianapolis, IN – "Fact Witness Training" – presented by Michael A. Evans, Ph.D. and Kathy Lee. (4/2012)
- Attended an internal development course in Indianapolis, IN – "Designing Disaster"– presented by Kevin Shanks, MS. (11/2012)
- Attended an internal development course in Indianapolis, IN – "AIT Talent Acquisition Process" – presented by Karen Oyler (10/2013)
- Attended a webinar in Indianapolis, IN – "A Look Back in Moving Forward" – presented by Timothy Fassette (MS, D-ABFT) and Sciex (3/2018)

References

References available on request.

DRUGS OF ABUSE PANEL

BASIC URINE PANEL

COMPREHENSIVE PANEL WITH ANALYTE ASSURANCE™

TOXICOLOGY PANEL FEATURES

DESIGNER OPIOIDS PANEL

NOVEL PSYCHOACTIVE SUBSTANCES PANEL

SYNTHETIC CANNABINOIDS PANEL

NOVEL EMERGING COMPOUNDS PANEL

NON-ROUTINE TESTING

AXIS

FORENSIC TOXICOLOGY

Drugs of Abuse Panels Specifcations

Axis Forensic Toxicology Drugs of Abuse Panels

Analyte Name	Screening Limit	Drug Class	Blood	Tissue	Fluid	Vitreous	Urine (70080)	Urine (80080)
6-Acetylmorphine	2 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
7-Aminoclonazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
Acetone	0.02 %(w/v)	VOLATILES	X	X	X	X		
Alpha-Hydroxyalprazolam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
Alprazolam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
Amobarbital/Pentobarbital	200 ng/mL	BARBITURATES	X	X	X	X	*	
Amphetamine	10 ng/mL	AMPHETAMINES	X				*	*
Benzoylecgonine	100 ng/mL	STIMULANTS	X	X	X	X	*	*
Benzphetamine (as Amphetamine)	10 ng/mL	AMPHETAMINES	X					
Buprenorphine	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Butabarbital	200 ng/mL	BARBITURATES	X	X	X	X	*	
Butalbital	200 ng/mL	BARBITURATES	X	X	X	X	*	
Carisoprodol	200 ng/mL	MUSCLE RELAXANTS	X		X	X		
Chlordiazepoxide	50 ng/mL	BENZODIAZEPINES	X	X	X	X		
Clonazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X		
Cocaethylene	20 ng/mL	STIMULANTS	X	X	X	X		
Cocaine	20 ng/mL	STIMULANTS	X	X	X	X		
Codeine	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Delta-9-THC	15 ng/mL	CANNABINOIDS	X	X	X	X		
Desalkylflurazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X		
Diazepam	25 ng/mL	BENZODIAZEPINES	X	X	X	X		
Dihydrocodeine	10 ng/mL	OPIOID ANALGESICS	X	X	X	X		
EDDP	50 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Ephedrine	50 ng/mL	AMPHETAMINES	X	X	X	X		
Estazolam	10 ng/mL	BENZODIAZEPINES	X	X	X	X		
Ethanol	0.02 %(w/v)	VOLATILES	X	X	X	X	X	
Fentanyl	0.2 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Flurazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X		
Hydrocodone	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Hydromorphone	2 ng/mL	OPIOID ANALGESICS	X		X	X	*	*
Hydroxytriazolam	15 ng/mL	BENZODIAZEPINES	X	X		X		
Isopropanol	0.02 %(w/v)	VOLATILES	X	X	X	X		
Lorazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
MDA	10 ng/mL	AMPHETAMINES	X		X	X		
MDEA	10 ng/mL	AMPHETAMINES	X	X	X	X		
MDMA	10 ng/mL	AMPHETAMINES	X	X		X	*	*
Meprobamate	1000 ng/mL	MUSCLE RELAXANTS	X	X	X	X	*	*
Methadone	50 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Methamphetamine	10 ng/mL	AMPHETAMINES	X	X	X	X	*	*
Methanol	0.02 %(w/v)	VOLATILES	X	X	X	X		
Midazolam	5 ng/mL	BENZODIAZEPINES	X	X	X	X		
Morphine	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Norbuprenorphine	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Nordiazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
Norfentanyl	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Norpropoxyphene	250 ng/mL	OPIOID ANALGESICS	X	X	X	X		
Norpseudoephedrine	50 ng/mL	AMPHETAMINES	X		X	X		
O-Desmethyltramadol	25 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Oxazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
Oxycodone	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Oxymorphone	4 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Phencyclidine	10 ng/mL	HALLUCINOGENS	X	X	X	X	*	*
Phenobarbital	200 ng/mL	BARBITURATES	X	X	X	X	*	
Phentermine	50 ng/mL	AMPHETAMINES	X					
Phenylpropanolamine	50 ng/mL	AMPHETAMINES	X			X		
Propoxyphene	250 ng/mL	OPIOID ANALGESICS	X	X	X	X		
Pseudoephedrine	50 ng/mL	AMPHETAMINES	X	X	X	X		
Secobarbital	200 ng/mL	BARBITURATES	X	X	X	X	*	
Temazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	*	*
THC-COOH	15 ng/mL	CANNABINOIDS	X	X	X	X	X	
Tramadol	20 ng/mL	OPIOID ANALGESICS	X	X	X	X	*	*
Triazolam	5 ng/mL	BENZODIAZEPINES	X	X	X	X		

AXIS

FORENSIC TOXICOLOGY

Comprehensive Panels Specifications

Analyte Name	Screening Limit	Drug Class	Blood	Urine	Vitreous	Tissue	Fluid
10-Hydroxycarbazepine	1000 ng/mL	ANTICONVULSANTS	X	*	*	*	*
1-Hydroxymidazolam	5 ng/mL	BENZODIAZEPINES	X	X	X	X	X
6-Acetylmorphine	2 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
6-Beta-Naltrexol	10 ng/mL	OPIOID ANALGESICS	*	*	*	*	*
7-Aminoclonazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
7-Aminoflunitrazepam	5 ng/mL	BENZODIAZEPINES	X	X	X	X	
9-Hydroxyrisperidone	5 ng/mL	ANTIPSYCHOTICS	X	X	X		X
Acebutolol	100 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Acetaminophen	20000 ng/mL	ANALGESICS	X	X	X	X	X
Acetone	0.02 %(w/v)	VOLATILES	X	X	X	X	X
Alfentanil	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Alpha-Hydroxyalprazolam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Alprazolam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Alprenolol	50 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Amiodarone	500 ng/mL	CARDIOVASCULARS	*		*		*
Amitriptyline	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Amlodipine	200 ng/mL	CARDIOVASCULARS	*	*			
Amobarbital/Pentobarbital	200 ng/mL	BARBITURATES	X	X	X	X	X
Amoxapine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Amphetamine	10 ng/mL	AMPHETAMINES	X				
Aripiprazole	50 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Atenolol	200 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Atomoxetine	100 ng/mL	MISCELLANEOUS	X	X	X	X	X
Atropine	1000 ng/mL	ANTICHOLINERGICS	X	X	X	X	X
Benzocaine	1000 ng/mL	ANESTHETICS	X	X	X	X	X
Benzoylecgonine	100 ng/mL	STIMULANTS	X	X	X	X	X
Benzphetamine (as Amphetamine)	10 ng/mL	AMPHETAMINES	X	X		X	
Benztropine	100 ng/mL	ANTICHOLINERGICS	X	X	X	X	X
Benzylpiperazine (BZP)	10 ng/mL	STIMULANTS	*	*	*		*
Betaxolol	25 ng/mL	CARDIOVASCULARS	*	*	*		*
Bisoprolol	25 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Bromazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Brompheniramine	10 ng/mL	ANTIHISTAMINES	X	X	X	X	X
Bupivacaine	1000 ng/mL	ANESTHETICS	X	X	X	X	X
Buprenorphine	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Bupropion	25 ng/mL	ANTIDEPRESSANTS	X	X			
Buspirone	25 ng/mL	ANTIPSYCHOTICS	X	*	*	*	*
Butabarbital	200 ng/mL	BARBITURATES	X	X	X	X	X
Butalbital	200 ng/mL	BARBITURATES	X	X	X	X	X
Butorphanol	2 ng/mL	OPIOID ANALGESICS	X		X	X	X
Caffeine	1000 ng/mL	STIMULANTS	*	*	*	*	*
Carbamazepine	1000 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Carbamazepine-10,11-epoxide	1000 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Carisoprodol	200 ng/mL	MUSCLE RELAXANTS	X	X	X		X
Chlordiazepoxide	50 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Chlorothiazide	1000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Chlorpheniramine	10 ng/mL	ANTIHISTAMINES	X	X	X	X	X
Chlorpromazine	100 ng/mL	ANTIPSYCHOTICS	X	X			X
Chlorpropamide	1000 ng/mL	ANTIDIABETICS	X	X	X	X	X
Citalopram/Escitalopram	100 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Clomipramine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Clonazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Clonidine	5 ng/mL	CARDIOVASCULARS	X	X	*		*
Clozapine	50 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Cocaethylene	20 ng/mL	STIMULANTS	X	X	X	X	X
Cocaine	20 ng/mL	STIMULANTS	X	X	X	X	X
Codeine	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Cotinine	200 ng/mL	STIMULANTS	*	*	*	*	*
Cyclizine	100 ng/mL	MISCELLANEOUS	X	X	X	X	X
Cyclobenzaprine	20 ng/mL	MUSCLE RELAXANTS	X	X	X	X	X
Delorazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Delta-9-THC	15 ng/mL	CANNABINOIDS	X	X	X	X	X
Demoxepam	100 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Desalkylflurazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Desipramine	50 ng/mL	ANTIDEPRESSANTS	X	X	X		X
Desmethylclomipramine	50 ng/mL	ANTIDEPRESSANTS	X	X	X		X
Desmethyldoxepin	25 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Desmethylflunitrazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Desmethylloperamide	5 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Desmethylsertraline	20 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Desmethyltrimipramine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Dextro/Levo Methorphan	50 ng/mL	OPIOID ANALGESICS	X	X	X		X
Dextrorphan/Levorphanol	100 ng/mL	OPIOID ANALGESICS	X	X	X		X
Diazepam	25 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Diclazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Dicyclomine	100 ng/mL	ANTICHOLINERGICS	X	X			
Dihydrocodeine	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Diltiazem	100 ng/mL	CARDIOVASCULARS	X	X	X	X	
Diphenhydramine	50 ng/mL	ANTIHISTAMINES	X	X	X	X	X
Disopyramide	100 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Donepezil	10 ng/mL	ANTICHOLINERGICS	X	X	X	X	X
Doxepin	25 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Doxylamine	50 ng/mL	ANTIHISTAMINES	X	X	X	X	X
Duloxetine	100 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
EDDP	50 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Ephedrine	50 ng/mL	AMPHETAMINES	X	X	X	X	X
Esmolol	1000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Estazolam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Eszopiclone/Zopiclone	10 ng/mL	SEDATIVE/HYPNOTICS	X				

Ethanol	0.02 %(w/v)	VOLATILES	X	X	X	X	X
Etomidate	100 ng/mL	ANESTHETICS	X	X	X	X	X
Fentanyl	0.2 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Flecainide	200 ng/mL	CARDIOVASCULARS	X	*	*	*	*
Flunitrazepam	5 ng/mL	BENZODIAZEPINES	X	X	X		X
Fluoxetine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Fluphenazine	5 ng/mL	ANTIPSYCHOTICS	X	X	X		X
Flurazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Fluvoxamine	250 ng/mL	ANTIDEPRESSANTS	X	X			
Furosemide	1000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Gabapentin	500 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Glimepiride	200 ng/mL	ANTIDIABETICS	X	X	X	X	X
Glipizide	200 ng/mL	ANTIDIABETICS	X	X	X	X	X
Glyburide	100 ng/mL	ANTIDIABETICS	X	X	X	X	X
Guaifenesin	5000 ng/mL	MISCELLANEOUS	X	X	X	X	X
Haloperidol	10 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Hydrochlorothiazide	2000 ng/mL	CARDIOVASCULARS	X	X	X	X	X
Hydrocodone	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Hydromorphone	2 ng/mL	OPIOID ANALGESICS	X	X	X		X
Hydroxybupropion	100 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Hydroxyethylflurazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Hydroxytriazolam	15 ng/mL	BENZODIAZEPINES	X	X	X	X	
Hydroxyzine	25 ng/mL	ANTIHISTAMINES	X	X	X	X	X
Ibuprofen	2500 ng/mL	ANALGESICS	X	X	X		X
Iloperidone	10 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Imipramine	25 ng/mL	ANTIDEPRESSANTS	X	X			
Indomethacin	1000 ng/mL	ANALGESICS	X	X	X	X	X
Isopropanol	0.02 %(w/v)	VOLATILES	X	X	X	X	X
Itraconazole	1000 ng/mL	ANTIFUNGALS	X	X	X	X	X
Ketamine	10 ng/mL	ANESTHETICS	X	X	X	X	X
Ketoconazole	1000 ng/mL	ANTIFUNGALS	X	X	X	X	X
Labetalol	1000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Lacosamide	500 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Lamotrigine	500 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Laudanosine	200 ng/mL	MUSCLE RELAXANTS	X		X	X	X
Levamisole	250 ng/mL	MISCELLANEOUS	*		*	*	*
Levetiracetam	2000 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Lidocaine	500 ng/mL	ANESTHETICS	X	X	X	X	X
Loperamide	5 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Loratadine	100 ng/mL	ANTIHISTAMINES	*	*	*		*
Lorazepam	10 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Loxapine	50 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
LSD	2 ng/mL	HALLUCINOGENS	X	X	X		X
Maprotiline	100 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
MDA	10 ng/mL	AMPHETAMINES	X		X		X
MDEA	10 ng/mL	AMPHETAMINES	X	X	X	X	X
MDMA	10 ng/mL	AMPHETAMINES	X	X	X	X	
Medazepam	100 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Memantine	10 ng/mL	MISCELLANEOUS	X	X			
Meperidine	100 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Mepivacaine	1000 ng/mL	ANESTHETICS	X	X	X	X	X
Meprobamate	1000 ng/mL	MUSCLE RELAXANTS	X	X	X	X	X
Mescaline	20 ng/mL	HALLUCINOGENS	X	X	X	X	X
Mesoridazine	100 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
meta-Chlorophenylpiperazine (mCPP)	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Metaxalone	250 ng/mL	MUSCLE RELAXANTS	X	X	X	X	X
Methadone	50 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Methamphetamine	10 ng/mL	AMPHETAMINES	X	X	X	X	X
Methanol	0.02 %(w/v)	VOLATILES	X	X	X	X	X
Methaqualone	200 ng/mL	SEDATIVE/HYPNOTICS	X	X	X	X	X
Methocarbamol	5000 ng/mL	MUSCLE RELAXANTS	X	X	X	X	X
Methsuximide	5000 ng/mL	ANTICONVULSANTS	*	*	*	*	*
Methylphenidate	10 ng/mL	STIMULANTS	X	X	X	X	X
Metoclopramide	10 ng/mL	MISCELLANEOUS	X	X	X	X	X
Metoprolol	25 ng/mL	CARDIOVASCULARS	X	X	X	X	X
Mexiletine	500 ng/mL	CARDIOVASCULARS	*	*		*	*
Midazolam	5 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Mirtazapine	25 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Mitragynine	10 ng/mL	MISCELLANEOUS	X	X	X		X
Monoethylglycinexylidide (MEGX)	500 ng/mL	ANESTHETICS	X	X	X	X	X
Morphine	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
N-Acetylprocainamide	1000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Nalbuphine	2 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Naloxone	5 ng/mL	OPIOID ANALGESICS	*	*	*	*	
Naltrexone	1 ng/mL	OPIOID ANALGESICS	*	*	*		*
Naproxen	3000 ng/mL	ANALGESICS	X	X	X	X	X
N-Desmethylsildenafil	50 ng/mL	UROLOGICALS	X	X	X		X
Nicotine	100 ng/mL	STIMULANTS	*	*			*
Nifedipine	10 ng/mL	CARDIOVASCULARS	X	X	X	X	X
Norbuprenorphine	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Norclozapine	25 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Nordiazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Norfentanyl	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Norfluoxetine	100 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Norketamine	20 ng/mL	ANESTHETICS	X	X	X	X	X
Normeperidine	100 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Norpropoxyphene	250 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Norpseudoephedrine	50 ng/mL	AMPHETAMINES	X	X	X		X
Nortriptyline	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
O-Desmethyltramadol	25 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
O-Desmethylvenlafaxine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X

Olanzapine	5 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Orphenadrine	50 ng/mL	MUSCLE RELAXANTS	X	X	*	*	*
Oxazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Oxprenolol	100 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Oxycodone	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Oxymorphone	4 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Papaverine	5000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Paroxetine	20 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Pentazocine	1000 ng/mL	OPIOID ANALGESICS	*	*	*	*	*
Pentoxifylline	200 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Phenacetin	5 ng/mL	ANALGESICS	*	*	*		*
Phenazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Phencyclidine	10 ng/mL	HALLUCINOGENS	X	X	X	X	X
Pheniramine	5 ng/mL	ANTIHISTAMINES	X	*	*	*	*
Phenobarbital	200 ng/mL	BARBITURATES	X	X	X	X	X
Phensuximide	500 ng/mL	ANTICONVULSANTS	*	*	*	*	
Phentermine	50 ng/mL	AMPHETAMINES	X				
Phenylbutazone	1000 ng/mL	ANALGESICS	*	*	*	*	*
Phenylethylmalonamide (PEMA)	1000 ng/mL	ANTICONVULSANTS	*	*	*	*	*
Phenylpropanolamine	50 ng/mL	AMPHETAMINES	X	X	X		
Phenytoin	1000 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Pindolol	20 ng/mL	CARDIOVASCULARS	*	*	*	*	*
PMA	10 ng/mL	AMPHETAMINES	X	X			X
Pregabalin	500 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Primidone	2500 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Procainamide	1000 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Prochlorperazine	10 ng/mL	ANTIPSYCHOTICS	X		*	*	*
Promazine	50 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Promethazine	5 ng/mL	ANTIHISTAMINES	X	X	X		X
Propoxyphene	250 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Propranolol	50 ng/mL	CARDIOVASCULARS	X	X	X	X	X
Pseudoephedrine	50 ng/mL	AMPHETAMINES	X	X	X	X	X
Pyrilamine	100 ng/mL	ANTIHISTAMINES	*	*	*	*	*
Quetiapine	100 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Quinidine/Quinine	200 ng/mL	MISCELLANEOUS	*	*	*	*	*
Reserpine	500 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Risperidone	5 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Ropivacaine	1000 ng/mL	ANESTHETICS	*	*	*	*	*
Salicylic Acid	5000 ng/mL	ANALGESICS	*	*	*	*	*
Salvinorin B	50 ng/mL	HALLUCINOGENS	X	X	X	X	X
Scopolamine	100 ng/mL	ANTICHOLINERGICS	X	X	X	X	X
Secobarbital	200 ng/mL	BARBITURATES	X	X	X	X	X
Sertraline	10 ng/mL	ANTIDEPRESSANTS	X	X	X		X
Sildenafil	50 ng/mL	UROLOGICALS	X	X	X		X
Sotalol	500 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Strychnine	10 ng/mL	MISCELLANEOUS	X	X	X	X	X
Sufentanil	1 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Suvorexant	20 ng/mL	SEDATIVE/HYPNOTICS	X	X	X	X	X
Tadalafil	50 ng/mL	UROLOGICALS	X	X	X	X	X
Tapentadol	10 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Temazepam	20 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Tetrahydrozoline	1 ng/mL	ANTIHISTAMINES	X	X	*	*	*
THC-COOH	15 ng/mL	CANNABINOIDS	X	X	X	X	X
Thioridazine	10 ng/mL	ANTIPSYCHOTICS	X	X	X	X	X
Tiletamine	100 ng/mL	SEDATIVE/HYPNOTICS	X	X			
Timolol	100 ng/mL	CARDIOVASCULARS	*	*	*	*	*
Topiramate	500 ng/mL	ANTICONVULSANTS	X	X	X	X	X
Tramadol	20 ng/mL	OPIOID ANALGESICS	X	X	X	X	X
Trazodone	100 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Triazolam	5 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Trihexyphenidyl	5 ng/mL	MISCELLANEOUS	X	X		*	*
Trimipramine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Triprolidine	10 ng/mL	ANTIHISTAMINES	X	X	X	X	X
Vardenafil	50 ng/mL	UROLOGICALS	X	X	X	X	X
Venlafaxine	50 ng/mL	ANTIDEPRESSANTS	X	X	X	X	X
Verapamil	20 ng/mL	CARDIOVASCULARS	X	X	X	X	X
Voriconazole	1000 ng/mL	ANTIFUNGALS	X	*	*	*	*
Warfarin	200 ng/mL	CARDIOVASCULARS	X	X	X	X	X
Xylazine	5 ng/mL	MUSCLE RELAXANTS	X	X	X	X	
Yohimbine	10 ng/mL	UROLOGICALS	X	X	X		X
Zaleplon	10 ng/mL	SEDATIVE/HYPNOTICS	X	X	X	X	X
Ziprasidone	10 ng/mL	ANTIPSYCHOTICS	X	*	*		*
Zolazepam	100 ng/mL	BENZODIAZEPINES	X	X	X	X	X
Zolpidem	10 ng/mL	SEDATIVE/HYPNOTICS	X	X	X	X	X
Zonisamide	500 ng/mL	ANTICONVULSANTS	X	X	X	X	X

* Denotes analyte is reported qualitatively based on screen result

Analytes Included as Part of Analyte Assurance TM

Analyte Name	Screening Limit	Drug Class	Blood	Urine	Vitreous	Tissue	Fluid
4-ANPP	0.1 ng/mL	DESIGNER OPIOIDS	X	X	X		
Acetyl Fentanyl	0.5 ng/mL	DESIGNER OPIOIDS	X	X	X		
Acrylfentanyl	0.1 ng/mL	DESIGNER OPIOIDS	X	X	X		
Butyrl Fentanyl/Isobutyryl Fentanyl	0.1 ng/mL	DESIGNER OPIOIDS	X	X	X		
Carfentanil	0.1 ng/mL	DESIGNER OPIOIDS	X	X	X		
cis-3-Methylfentanyl	0.1 ng/mL	DESIGNER OPIOIDS	X	X	X		
Cyclopropylfentanyl	0.5 ng/mL	DESIGNER OPIOIDS	X	X	X		
Furanyl Fentanyl	0.1 ng/mL	DESIGNER OPIOIDS	X	X	X		
Methoxyacetylfentanyl	0.5 ng/mL	DESIGNER OPIOIDS	X	X	X		
U-47700	0.2 ng/mL	DESIGNER OPIOIDS	X	X	X		
Butonitazene	1 ng/mL	NITAZENE ANALOG	X				

Etodesnitazene	1 ng/mL	NITAZENE ANALOG	X				
Etonitazene	1 ng/mL	NITAZENE ANALOG	X				
Flunitazene	1 ng/mL	NITAZENE ANALOG	X				
Isotodesnitazene	1 ng/mL	NITAZENE ANALOG	X				
Isotonitazene	1 ng/mL	NITAZENE ANALOG	X				
Metodesnitazene	1 ng/mL	NITAZENE ANALOG	X				
Metonitazene	1 ng/mL	NITAZENE ANALOG	X				
N-Pyrrolidino Etonitazene	1 ng/mL	NITAZENE ANALOG	X				
Protonitazene	1 ng/mL	NITAZENE ANALOG	X				
AP-237	1 ng/mL	NOVEL EMERGING SUBSTANCES	X				
Brorphine	1 ng/mL	NOVEL EMERGING SUBSTANCES	X				
Fluorofentanyl	0.5 ng/mL	NOVEL EMERGING SUBSTANCES	X				
Adinazolam	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Flualprazolam	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Clonazolam	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Etizolam	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Flubromazolam	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
25B-NBOMe	1 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
25C-NBOMe	1 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
25I-NBOMe	1 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
2C-B	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
2C-E	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
2C-I	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
5-MeO-DALT	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Alpha-PVP	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Butylone	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Dibutylone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Dimethylone	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Ethylone	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Eutylone	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
MDPV	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Mephedrone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Methcathinone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Methedrone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Methoxetamine	5 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Methylone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
N-Ethyl Pentylone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
Pentylone	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
TFMPP	10 ng/mL	NOVEL PSYCHOACTIVES	X	X	X		
4CN-CUMYL-BINACA	200 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
4F-MDMB-BINACA	200 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
5F-ADB	200 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
5F-ADB Butanoic Acid Metabolite	200 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
5F-MDMB-PICA	200 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
ADB-FUBINACA	200 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
FUB-144	0.5 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
FUB-AMB	0.5 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
MDMB-FUBINACA	0.5 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		
MDMB-FUBINACA Butanoic Acid Metabolite	2 ng/mL	SYNTHETIC CANNABINOIDS	X	X	X		

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See our Test Catalog at www.axisfortox.com
for more information.

TOXICOLOGY PANELS

ADD CERTAINTY TO YOUR TOXICOLOGY

	Drugs of Abuse Panel	Comprehensive Panel
Primary matrix: blood, vitreous, fluid, tissue	✓	✓
Urine Qualitative Panel available	✓	
Whole case approach (see reverse)	✓	✓
Drug classes analyzed	9	25
Maximum analytes (see analyte table)	50+	300+
Analyte Assurance™		✓

Analyte Assurance™, a feature of the Comprehensive Panel.

If Axis observes a potentially positive novel substance [Designer Opioids, Novel Psychoactives, Synthetic Cannabinoids, Novel Emerging, Nitazene Analogs], we will contact you to offer the relevant confirmation panel. Benefits include:

- ensures novel substances do not go undetected
- pay only for the confirmation IF ORDERED.
- testing proceeds in parallel with Comprehensive panel to help close out cases in a shorter time period

SMR369, version 3.0

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AXIS' WHOLE CASE APPROACH

While blood is the preferred matrix, there is significant benefit to testing multiple specimens. Testing in urine and vitreous can:

- compensate for the quick metabolism of certain compounds such as 6-Acetylmorphine (2-3 hours in blood vs 8 hours in urine)
- corroborate blood findings
- give attorneys additional certainty in litigation
- provide a complete picture of your case

	Blood	Urine	Vitreous
Specimen			
Testing	Drugs of Abuse OR Comprehensive	Basic Drugs of Abuse Qualitative	Vitreous Volatiles (if Ethanol positive in blood)
Benefits	Recognized standard for quantitation and concentration	Corroborates timeline and catches fast metabolizing drugs	Mitigates effects of decomposition on blood alcohol
Cost	**One Bundled Price**	Included with Blood	Included with Blood

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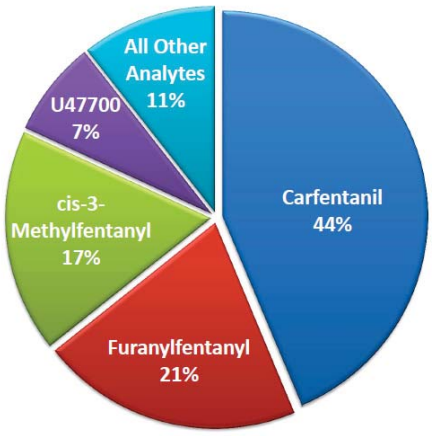
DESIGNER OPIOIDS PANEL



Updated Designer Opioids Panel Key Features & Benefits

- Latest, most relevant emergent designer opioid analytes
- Quantitative blood results
- Lower limit of detection to ensure no missed results
- Improved reporting
- Quicker turnaround time

BECAUSE NOT ALL OPIATES ARE CREATED EQUAL...

58% of samples tested with the Designer Opioids Panel were found positive for one or more analytes.# Axis recommends ordering this panel for all fatalities that have circumstances consistent with Opioid use or intravenous drug abuse and negative routine blood toxicology for opiates/opioids such as 6-Acetylmorphine, morphine, and fentanyl.

#Data Source: Axis analyzed 1,408 blood specimens for the presence of fentanyl analogs and designer opioid analytes using LC/MS/MS between July 2016 to July 2017.

ORDER CODE: 13810	
SAMPLE TYPE: Blood, Serum*, Urine*, Vitreous*	
MINIMUM SAMPLE VOLUME: 0.5 mL (2mL preferred)	
ANALYTES INCLUDED:	**REPORTING LIMIT:**
4-ANPP	50 pg/mL*
Acetylfentanyl	50 pg/mL
Acrylfentanyl	50 pg/mL
Beta-hydroxythiofentanyl	50 pg/mL
Butyrylfentanyl/Isobutyrylfentanyl	50 pg/mL
Carfentanil	10 pg/mL**
cis-3-Methylfentanyl	50 pg/mL
Cyclopropylfentanyl	50 pg/mL
Furanylfentanyl	50 pg/mL
Methoxyacetylfentanyl	50 pg/mL
Ocfentanil	50 pg/mL
Para-fluorobutyrylfentanyl/Para-fluoroisobutyrylfentanyl	50 pg/mL
Tetrahydrofuranfentanyl	50 pg/mL
U47700	50 pg/mL

*Results reported qualitatively on final report. **Carfentanil results reported qualitatively between 10-20 pg/mL.

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NOVEL PSYCHOACTIVE SUBSTANCES PANEL

Panel includes a wide variety of substances that have emerged in the illicit drug market:

- **Depressants**
- **Hallucinogens**
- **Dissociatives**
- **Stimulants**

(Please see reverse side for the complete list of analytes included in panel.)

PSYCHOACTIVE SUBSTANCES REFERENCE GUIDE

Alternate Names	Bath Salts, Plant Food, Glass Cleaner, Jewelry Cleaner, Ivory Wave, Vanilla Sky, Molly, Flakka, Gravel, NBOME, Research Chemicals
Facts	- The Drug Enforcement Agency (DEA) recognizes newly emerging psychoactive substances as serious public health threats[1] - Illicit similar effects as methamphetamine, cocaine, MDMA, LSD, opioids or benzodiazepines - Can be smoked, snorted, orally ingested, bucally absorbed or injected - Sold in powder, crystal, tablet, or liquid form; can also be found on blotter paper - Adverse side effects include: hyperthermia, hypertension, nausea, vomiting, agitation, violent behavior, panic attacks, delusions, hallucinations, suicidal ideation, seizure and death[1]

References

[1]Office of Diversion Control. 9 Nov. 2015. http://www.deadiversion.usdoj.gov/synthetic_drugs/about_sd.html.

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NOVEL PSYCHOACTIVE SUBSTANCES PANEL

ORDER CODE: 13610

SAMPLE TYPE: Blood, Urine*, Vitreous*

MINIMUM SAMPLE VOLUME: 0.5 mL (2 mL preferred)

ANALYTES INCLUDED:	REPORTING LIMIT:
2C-B*	5 ng/mL
2C-E*	5 ng/mL
2C-I*	5 ng/mL
25B-NBOMe	0.5 ng/mL
25C-NBOMe	0.5 ng/mL
25I-NBOMe	0.5 ng/mL
5-MeO-DALT*	5 ng/mL
Adinazolam*	5 ng/mL
Alpha-PVP	5 ng/mL
Butylone	5 ng/mL
Clonazolam	5 ng/mL
Dibutylone	5 ng/mL
Dimethylone	5 ng/mL
Ethylone	5 ng/mL
Etizolam	5 ng/mL
Eutylone*	5 ng/mL
Flualprazolam*	5 ng/mL
Flubromazolam	5 ng/mL
MDPV	5 ng/mL
Mephedrone*	5 ng/mL
Methcathinone*	5 ng/mL
Methedrone*	5 ng/mL
Methoxetamine	5 ng/mL
Methylone	5 ng/mL
N-Ethylpentylone	5 ng/mL
Pentylone	5 ng/mL
TFMPP*	5 ng/mL

*Denotes qualitative reporting

SMR295, version 2.0

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for more information.

SYNTHETIC CANNABINOIDS (K2/SPICE)

Axis Forensic Toxicology leads the industry in designer drug testing

AXIS' SYNTHETIC CANNABINOIDS PANEL INCLUDES THE NEWEST GENERATION DESIGNER DRUG COMPOUNDS

Evolution of Synthetic Cannabinoids

- After a dramatic rise in the number and frequency of synthetic cannabinoids between 2010 and 2017, Axis has observed a steady decline in and some changes to the incidence of synthetic cannabinoids.
- Three compounds (5-fluoro-ADB, ADB-FUBINACA, and FUB-AMB) dominated the drug market in 2017-2018 accounting for approximately 77% of synthetic cannabinoids reported by the DEA, while all other compounds decreased into obscurity.
- As of the most recent DEA data, the above three compounds, alongside newly emerged compounds (4-cyano-CUMYL-BINACA, 4-fluoro-MDMB-BINACA, 5-fluoro-MDMB-PICA, and FUB-144) accounted for approximately 98% of all synthetic cannabinoids reported by the DEA emergency reports.

Analyte	Reporting Limit (ng/mL)
4-cyano-CUMYL-BINACA	0.5
4-fluoro-MDMB-BINACA	0.5
5-fluoro-MDMB-PICA	0.5
ADB-FUBINACA	0.5
FUB-144	0.5
5-fluoro-ADB Butanoic Acid Metabolite	2.0
FUB-AMB / AB-FUBINACA Butanoic Acid Metabolite	2.0
MDMB-FUBINACA Butanoic Acid Metabolite	2.0

Screening for synthetic cannabinoids is now included with Analyte Assurance™, a feature of Axis' Comprehensive Panels.

SMR313, version 2.0

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See our Test Catalog at www.axisfortox.com
for more information.

NOVEL EMERGING SUBSTANCES

Axis Forensic Toxicology leads the industry in designer drug testing

AXIS' NOVEL EMERGING SUBSTANCES PANEL GIVES VISIBILITY TO THE PRESENCE OF THESE COMPOUNDS IN YOUR AREA

Why a Novel Emerging Substances Panel?

- Novel substances can disappear as quickly as they appear, placing challenges on laboratories to develop detection methods quickly.
- These compounds are frequently found mixed with other, routinely identified compounds such as fentanyl or methamphetamine.
- In the current focus on public health, many jurisdictions want to be sure they are identifying the full scope of impactful compounds.
- There is insufficient data to determine the impact of a given concentration.
- This panel is designed to be focused on detection and rapidly updated.
- Results are reported qualitatively from our high-resolution screening method using a second aliquot of the specimen.

Current Analytes	
AP-237	**Fluorofentanyl**
Brorphine	

Screening for novel emerging compounds is now included with Analyte Assurance™, a feature of Axis' Comprehensive Panels.

SMR372, version 4.0

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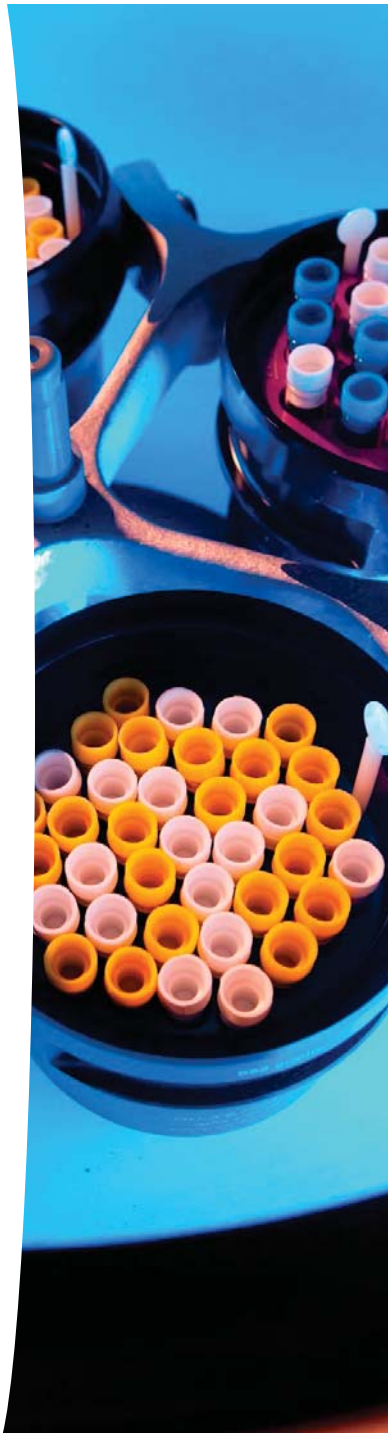
NON-ROUTINE ANALYSIS IN THE TOXICOLOGY LAB

INTERESTED IN NON-ROUTINE OR ESOTERIC TESTING?

FOR OVER 25 YEARS, AXIS HAS PERFORMED NON-ROUTINE ANALYSES ON A MULTITUDE OF SUBSTANCES

NON-ROUTINE TESTING INCLUDING:

- Suspected illicit drug substances including:
  - Methamphetamine
  - Cocaine
  - Heroin
  - PCP
- Syringes
- Residues
- Designer substances such as:
  - Synthetic Cannabinoids
  - Hallucinogens
  - Cathinones
  - Opioids/Fentanyl Analogs
- Tablets/Pills/Capsules
- Liquids



WHO CAN BENEFIT FROM NON-ROUTINE TESTING?

- Attorneys
- Medical Examiners/Coroners
- Law Enforcement Officials or Agencies
- Emergency Rooms
- Poison Centers
- Drug Chemistry Labs

SERVICES

- Qualitative Drug Identification
  - Order code: 20040
- Quantitative Drug Analysis
  - Order code: 20000
- Special Method Development
  - Order code: 20020

For pricing, please contact Inquiries at 317-715-0448 (opt. 6) or via email at inquiries@axisfortox.com.

EXHIBIT I – AXIS FORMS

ACCOUNT INFORMATION FORM

REQUISITION FORM

BLOOD MANIFEST FORM

AFFIDAVIT

CASE RELEASE FORM

SUPPLY ORDER

SAMPLE INVOICE

AXIS
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ACCOUNT INFORMATION FORM

Thank you for choosing Axis Forensic Toxicology. In order to provide our best service, we request that you complete this form and return it by email to **supplies@axisfortox.com** or via fax to **317-481-8872**. If you have any questions, please call 317-759-4TOX (4869).

☐ **New Account** ☐ **Update Account #**_____

1) Account Information: ☐ **No Changes**

Account Name: _____
Primary Contact: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email: _____

2) Billing Information: ☐ **No Changes**

Bill to: ☐ Same as Account Info Above ☐ Alternate Account Info (if different, complete below)
Invoicing Method: ☐ Email _____ ☐ Mail
Payment Method: ☐ ACH (Billing will contact) ☐ Payment/Credit card (web) ☐ Check
Agency Name: _____
Billing Contact: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email: _____

3) Supply Information: ☐ **No Changes**

Supplies cannot be shipped to Post Office Boxes

Ship to Address: ☐ Same as Account Info Above Attn: _____
☐ Alternate Supply Recipient – Complete reporting information below or provide name/account number
Agency: _____
Supplies Contact: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email: _____

4) Results Reporting Information: ☐ **No Changes**

Report to: ***Secure Online Portal*** ☐ Fax To: _____
Primary User: Same as Account Info Above ***(add users in section 5)***

Please continue to next page....

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ACCOUNT INFORMATION FORM

☐ **New Account** ☐ **Update Account #_____**

5) Additional Authorized Users: ☐ **No Changes**

Please indicate level of authorization by checking the appropriate box for each additional user associated with the account.

User #2 Name:			Email:	
Authorization:	☐ Add-on tests	☐ Order Supplies	☐ Request results	☐ Portal Access
User #3 Name:			Email:	
Authorization:	☐ Add-on tests	☐ Order Supplies	☐ Request results	☐ Portal Access
User #4 Name:			Email:	
Authorization:	☐ Add-on tests	☐ Order Supplies	☐ Request results	☐ Portal Access
User #5 Name:			Email:	
Authorization:	☐ Add-on tests	☐ Order Supplies	☐ Request results	☐ Portal Access

6) Authorized Client Signature (Required)

I authorize Axis Forensic Toxicology to apply the information contained on this form to my account. I acknowledge that having an imaged version of the signed form is the same as having the physically signed form.

Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

AXIS FORENSIC TOXICOLOGY
axisfortox.com
labclientsupport@axisfortox.com
Phone: (317) 759 - 4869

TOXICOLOGY REQUISITION FORM

FC1000000

Section 1: Account Information

Send Additional Reports To: (Please include account #, name, address, or fax number. Email not accepted.)

Section 2: Collection / Chain of Custody Information

Investigator:	County:	State:

Pathologist:

Specimens obtained/ sent to laboratory by: _____ (Signature)

Date: ___/___/___ _____ (Printed name)

Please note all individuals listed will be authorized access to final report.

Section 3: Subject Information

Last Name: First Name: Middle Initial:

Date of Death: - - Age: Days / Months / Years (circle one) Gender: Male Female

Agency Case #:

Section 4: Specimens Submitted

TYPE	SOURCE	DATE/TIME COLLECTED	TYPE	SOURCE	DATE/TIME COLLECTED
Blood			Urine		
Blood			Vitreous		
Blood			Tissue/Other		

Additional Instructions:

Section 5: Test Request Information (Test subject to change without notice. Please refer to our test catalog at www.axisfortox.com for an up-to-date test menu)

- ☐ 70510 **COMPREHENSIVE DRUG PANEL (Blood, Urine, Vitreous)**
- ☐ 70510T **COMPREHENSIVE DRUG PANEL (Tissue)**
- ☐ 70531 **DRUGS OF ABUSE EXTENDED PANEL (Blood, Urine, Vitreous)**
- ☐ 70530 **DRUGS OF ABUSE PANEL (Blood, Urine, Vitreous)**
- ☐ 70530T **DRUGS OF ABUSE PANEL (Tissue)**
- ☐ 13810 **DESIGNER OPIOIDS PANEL (Blood)**
- ☐ 13610 **PSYCHOACTIVE SUBSTANCES PANEL (Blood)**
- ☐ 42130 **SYNTHETIC CANNABINOIDS [K2/Spice] (Blood)**
- ☐ 32400 **ELECTROLYTE PANEL (Vitreous)**
- ☐ 44060 **CARBON MONOXIDE (Blood)**

Additional test requests (order code):

Specimen Labels: Place one label on each specimen container.

FC1000000 FC1000000 FC1000000 FC1000000 FC1000000 FC1000000

Section 6: Brief Case History (Please identify the manner of death, if known, and drugs to which the subject may have had access)

Section 7: Laboratory Use Only

Received at laboratory and placed into temporary storage by: _____ Date: _____

Complete all sections 1 through 6. COPY 1: Original must accompany specimen(s) to the laboratory. COPY 2: Retain for your records. **AXIS-REQ v6**

By submitting this requisition, Client acknowledges that it relies upon Axis to select an appropriate method for the requested testing and accepts a simplified report without the method listed. For method information, please contact labclientsupport@axisfortox.com

AXIS
FORENSIC TOXICOLOGY

BLOOD MANIFEST FORM

In accordance with federal aviation guidelines, please complete this ***Blood Manifest*** by indicating the requisition/case number of each specimen being shipped to AXIS Forensic Toxicology. The ***Blood Manifest*** must be used when shipping any blood specimens in a Laboratory Pak/OVERPACK bag to AXIS and will help ensure that the specimens being sent match the specimens received.

For questions regarding the shipment of forensic toxicology cases, please contact **supplies@axisfortox.com** or **(317) 759-4TOX option #2.**

BLOOD MANIFEST		
Number of cases included in Lab Pak/OVERPACK bag: _____	Client's Initials: _____	Account Number: _____

	Requisition/Subject's Name
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

INTERNAL LAB USE ONLY
Number of specimens/cases received: _____

AXIS
FORENSIC TOXICOLOGY

www.axisfortox.com
(317) 759-4TOX

ADDITIONAL INFORMATION REQUESTED

Print Date: 04/24/2020

TO: 20200 Test Client
FAX: 999-999-9999

Thank you for your submission to AXIS Forensic Toxicology. The Laboratory may be unable to complete testing on the submitted case without further instructions.

Donor Name:	**AFFIDAVIT SAMPLE**		
Agency Case:	**AFFIDAVIT SAMPLE**	Laboratory Order:	**3111234**
Date of Receipt:	**04/24/2020**		

Please review our request below for additional information. Please complete and return to Axis Forensic Toxicology by fax.

The submitted requisition does not indicate testing instructions or orders.

What testing would you like to proceed with?

You may provide additional instructions to the laboratory by completing and faxing this form to us at (317) 481-8872 or emailing the form to labclientsupport@axisfortox.com

Additional Instructions: _____

_____ (Name) _____ (Date)

Testing may be cancelled and the case will be placed in storage by: 05/01/2020

AXIS
FORENSIC TOXICOLOGY

CASE RELEASE FORM

Axis Forensic Toxicology, Inc. has received a request to share information or access to a case that has been submitted to us on behalf of you, our client, with a third party

Axis' requires clients to provide written permission and/or release prior to giving information or access to samples in our custody to third parties (including subject family members), unless a court-ordered subpoena is issued. To ensure proper authorization is obtained, please complete and return this form via email to labclientsupport@axisfortox.com or via fax to 317- 481-8872.

I_____, on behalf of the _____
(Name) (Account Number/Agency Name)

hereby give permission to Axis Forensic Toxicology, Inc., to perform the following activities with the

remaining specimens belonging to_____in
(Subject's First and Last Name)

Axis Laboratory Order number_____.
(Axis Laboratory Order Number)

Please Select One:

☐ Provide and discuss results

☐ Release billing responsibility

☐ Release ownership of the case and all remaining specimens

☐ Release ONLY the following specimens:

- Sample Type:_____ Axis Specimen ID:_____
- Sample Type:_____ Axis Specimen ID:_____
- Sample Type:_____ Axis Specimen ID:_____
- Sample Type:_____ Axis Specimen ID:_____

☐ Other (please specify):_____

Agency or Individual Receiving Results/Invoice/Ownership of Case

Agency/Individual Name:_____

Address:_____

City:_____ State:_____ Zip:_____

Phone:_____ E-Mail:_____

Client Signature:_____Date:_____
(Please print and sign form)

Printed Name:_____Title: _____

Lab use only: Received by:_____Date Received:_____

AXIS
FORENSIC TOXICOLOGY

SUPPLY ORDER FORM

Thank you for choosing AXIS Forensic Toxicology. In order to provide our best service, we request that you complete sections one (1) and two (2) of this form and return it via email to **supplies@axisfortox.com** or via fax to **317-481-8872**. If you have any questions, please call 317-759-4TOX (4869), option #2.

−PLEASE ALLOW 3-5 DAYS FOR DELIVERY−

1) ACCOUNT & SHIPPING INFORMATION

Account Name: _____

Account Number: _____

Supply Contact Name: _____

Phone: _____ Email *(for shipping confirmation and delivery info)*: _____

Name: (if different than supply contact) _____

Address: _____

Address 2: (if applicable) _____

City: _____ State: _____ Zip: _____

Special Shipping Instructions:

2) SUPPLIES

Collection Kits Available:	**Quantity**			
Standard Postmortem Collection Kit	10	25	50	Other:
Meconium Collection Kit	10	25	50	Other:
DUI/DUID Collection Kit	10	25	50	Other:
Drug-Facilitated Sexual Assault Collection Kit	10	25	50	Other:
Trace/Non-biological Collection Kit	10	25	50	Other:
Requisition Forms	10	25	50	Other:
Return Shipping Labels	10	25	50	Other:
Mailing Bags	10	25	50	Other:
Other Supplies:				Qty:
Other Supplies:				Qty:
Other Supplies:				Qty:

Axis Forensic Toxicology, Inc.
P. O. Box 681513
Indianapolis, IN 46268

Invoice

Date	Invoice #
7/20/2017	7174

Bill To
Client Name Client Address Client City/State/Zip

Please contact us with any questions:
billing@axisfortox.com
317-759-4TOX (4869); Press #1

Three convenient ways to pay: (1) credit card online at www.axisfortox.com
(2) check remittance to P. O. Box 681513, Indianapolis, IN 46268, or
(3) via ACH (please email billing@axisfortox.com for banking instructions).

Terms	Account #
Due on receipt	CLIENT ACCOUNT #

Report Date	Item	Description	Case/Donor ID	Axis ID	Name	Amount
1/1/2017	70531	Drugs of Abuse - Extended	ME-2017	1234567	DOE, JOHN	225.00
1/1/2017	32400	Electrolytes Panel	ME-2017	1234567	DOE, JOHN	75.00
1/2/2017	70530	Drugs of Abuse Panel	ME-2017	7891011	DOE, JANE	150.00

Total $450.00

www.axisfortox.com

AXIS
FORENSIC TOXICOLOGY

Testing Report
Web: www.axisfortox.com
Phone: (317) 759-4TOX

Laboratory Case Number: 3214361

Client Account: 20200 / fopt01

Report To: Axis Forensic Toxicology
ATTN: Matt Zollman
5780 W. 71st St.
Indianapolis, IN 46278
FX: 317-481-8872

Subject's Name: SAMPLE, ROBERT

Agency Case #: SAMPLE
Date of Death: 01/24/2021
Test Reason: Death Investigation
Investigator: SAMPLE REPORT
Date Received: 01/28/2021
Date Reported: 01/29/2021

Laboratory Specimen No: 40914507
Container(s): 01:GRT Blood,FEMORAL

Date Collected: 01/25/2021
Test(s): 70510 Comprehensive Drug Panel, Blood

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
VOLATILES	POSITIVE					
Methanol	Negative			Not Established		
Ethanol	POSITIVE	0.050	0.02		% (w/v)	
Acetone	Negative			Not Established		
Isopropanol	Negative			Not Established		
AMPHETAMINES	Negative					
ANALGESICS	Negative					
ANESTHETICS	Negative					
ANTICHOLINERGICS	Negative					
ANTICONVULSANTS	Negative					
ANTIDEPRESSANTS	Negative					
ANTIDIABETICS	Negative					
ANTIFUNGALS	Negative					
ANTIHISTAMINES	Negative					
ANTIPSYCHOTICS	Negative					
BARBITURATES	Negative					
BENZODIAZEPINES	Negative					
CANNABINOIDS	Negative					
CARDIOVASCULARS	Negative					
GASTROINTESTINALS	Negative					
HALLUCINOGENS	Negative					
MISCELLANEOUS	Negative					

Laboratory Specimen No: **40914507** **Continued..**

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
MUSCLE RELAXANTS	Negative					
OPIOID ANALGESICS	POSITIVE					
Oxycodone	POSITIVE	24	5	10 - 200	ng/mL	
SEDATIVE/HYPNOTICS	Negative					
STIMULANTS	Negative					
UROLOGICALS	Negative					

Specimens will be kept for at least one year from the date of initial report.

Reference ranges obtained from Schulz M, Iwersen-Bergmann S, Andresen H, Schmoldt A. Therapeutic and toxic blood concentrations of nearly 1,000 drugs and other xenobiotics. Crit Care. 2012;16(4):R136. Published 2012 Jul 26. doi:10.1186/cc11441

Laboratory Specimen No: **40914508** **Date Collected:** 01/25/2021
Container(s): 01:YTT Urine, Random **Test(s):** 80080 Basic Drugs of Abuse, Urine

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
AMPHETAMINES	Negative					
Amphetamine	Negative					
Methamphetamine	Negative					
MDMA	Negative					
BENZODIAZEPINES	Negative					
7-Aminoclonazepam	Negative					
Alprazolam	Negative					
a-OH-Alprazolam	Negative					
Lorazepam	Negative					
Nordiazepam	Negative					
Oxazepam	Negative					
Temazepam	Negative					
HALLUCINOGENS	Negative					
Phencyclidine (PCP)	Negative					
MUSCLE RELAXANTS	Negative					
Meprobamate	Negative					
OPIOID ANALGESICS	POSITIVE					
6-Monoacetylmorphine	Negative					
Buprenorphine	Negative					
Codeine	Negative					
EDDP	Negative					
Fentanyl	Negative					
Hydromorphone	Negative					
Hydrocodone	Negative					
Methadone	Negative					
Morphine	Negative					
Norfentanyl	Negative					
Norbuprenorphine	Negative					
O-Desmethyltramadol	Negative					
Oxycodone	POSITIVE					
Oxymorphone	Negative					
Tramadol	Negative					

Laboratory Specimen No: **40914508** **Continued..**

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
STIMULANTS	Negative					
Benzoylecgonine	Negative					

AXIS
FORENSIC TOXICOLOGY

Testing Report
Web: www.axisfortox.com
Phone: (317) 759-4TOX

Laboratory Specimen No: **40914509** **Date Collected:** 01/25/2021
Container(s): 01:CTT Vitreous,EYE **Test(s):**

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
VOLATILES	POSITIVE					
Methanol	Negative			Not Established		
Ethanol	POSITIVE	0.080	0.02		% (w/v)	
Acetone	Negative			Not Established		
Isopropanol	Negative			Not Established		

The Specimen identified by the Laboratory Specimen Number has been handled and analyzed in accordance with all applicable requirements.

Laboratory Director

George S. Behonick, Ph.D., F-ABFT

SAMPLE, ROBERT
Laboratory Case #:3214361
Print Date/Time:01/29/2021, 10:53

Case Reviewer

This individual may not have performed any of the analytical work.

SPECIMEN HANDLING

SURVEILLANCE OF FORENSIC TESTING CAPABILITIES

AXIS FORENSIC TOXICOLOGY	**Procedure**
Title: Specimen Handling Procedure	
Control #: LDP094	Version: 2.0

1.0 Purpose

There are three phases of the entire laboratory testing process; pre-analytical, analytical, and post-analytical. The purpose of this document is to provide an outline of our process throughout the three phases. Our processes are designed to ensure the integrity of the final test result. The three phases are described as follows:

Pre-analytical: This phase covers the sample from the time the test is ordered until the sample is ready for analysis. Ensuring sample integrity throughout the pre-analytical phase involves proper sample collection, handling, shipment, and temporary storage procedures. Incorrect procedures can lead to incorrect specimen identification, loss of analyte because of instability, false increases in analyte concentration because of contamination, or changes in the matrix composition that may adversely affect the performance of the analytical method.

Analytical: This phase covers the entire analytical process from aliquoting a sample to certifying the analytical results. Integrity of the sample identity must be maintained so that the final result reported relates to the individual sample that was collected. All specimens throughout this process are individually labeled with unique barcode identification that is present on any specimen aliquots, all chain of custody documents, and LIMS to ensure sample integrity is maintained.

Post-analytical: This phase covers all activities after the analytical phase. It involves ensuring the overall integrity of the documentation that supports the analysis, including validation of the method prior to initiating subject testing. This includes a wide range of information, including paper and electronic raw data, standard operating procedures, facility records, validation reports final reports and interpretation of results.

2.0 Scope

This procedure encompasses all three phases of the entire laboratory testing process; pre-analytical, analytical, and post-analytical.

3.0 Responsibility

This procedure is the responsibility of all employees who are involved in the handling of laboratory specimens.

4.0 Procedure

4.1 **Specimen Collection & Processing: Most of our specimens are collected as described in documents provided to clients. For specimens not addressed in this document, specific instructions are provided to the client. While sample collection and initial processing are often very simple technical procedures, if they are poorly performed the quality of the samples will be compromised, nullifying any further activities performed in the laboratory.**

4.2 **Specimen Stability and Storage Conditions: Clients are encouraged to ship specimens as soon after collection as possible. If this is not possible and specimens must be stored at the collection facility, storage at refrigerated temperatures is encouraged.**

4.3 **Specimen Transport: Specimen samples may be received via courier service, or government and private mailing agencies. The majority of specimens are received at Axis Forensic Toxicology after having been shipped at ambient temperatures. If specimens are to be shipped at any temperature other than ambient, specific instructions will be prepared on a client or project specific basis.**

4.4 Laboratory Receiving of Specimens & Initial Preparation of Specimens

4.4.1 Specimens are received into the laboratory by Shipping and provided to Specimen Processing. If specimens are delivered to the receptionist or received through the regular mail, those specimens will be provided to accessioning.

4.4.2 Upon receiving the sample, the "Chain of Custody" (COC) information on the laboratory requisition will be completed. This documents the condition of the specimen, the date received, and the name of the individual who opened the package.

4.4.3 Each specimen will be assigned a unique laboratory accession number. This number is provided by our Laboratory Information Management System (LIMS). LIMS will assign a Specimen Number and print bar coded labels unique for each specimen. The bar coded label contains the bar code and a numeric display of the Specimen Number.

4.4.4 The bar coded label will be placed on the requisition form, the outer case box (if present) and the primary sample container associated with a particular specimen.

> *NOTE:* All containers in which the specimen is placed will be labeled with the unique Specimen Number. The primary container is labeled at the point at which it is entered into LIMS. All other containers (aliquots from the primary container, extraction tubes, autosampler vials, solid phase extraction cartridges, etc.) will be labeled prior to the aliquot being placed in the container.

4.4.5 Information associated with each specimen is entered into LIMS. This information includes relevant demographic information, client information, ordered tests, specimen type, and any other relevant information to the submitted case.

4.4.6 Any aberrant information associated with each specimen (i.e. specimen leakage, unusual color, etc.) is noted in LIMS at this time.

4.4.7 Portions of the sample (aliquots) will be placed into containers appropriate for the initial testing phase of sample analysis. These containers are also labeled with a bar code label.

4.4.8 Only one specimen sample is to be opened at a time for transferring into its assigned container.

4.4.9 Once aliquots have been produced from the parent container, the parent container is placed back into its original case box and placed into defined temporary storage.

4.4.10 A worklist/internal chain of custody will be generated for the screening department. This worklist indicates all the aliquoted specimens in the batch. The Technician who prepared the aliquots and delivered them to temporary storage will sign and date the worklist. The next Technician will sign and date the internal chain of custody when they pick up the aliquots from temporary storage.

4.5 Analytical Handling Procedures – Screening/Initial Testing

4.5.1 Screening may require Technicians to perform extraction based procedures prior to analytical run. These procedures are outlined in each specific analytical method in the form of a checklist.

4.5.2 Screening analysts will conduct initial screening data analysis using the approved Standard Operating Procedures (SOPs).

4.5.3 The screening analyst will sign and date the worklist Chain of Custody (COC) indicating they have performed the analysis and evaluated the analytical data.

4.5.4 A list of presumptively positive specimens will be generated.

4.6 Preparation of Specimens for Confirmatory analysis

4.6.1 Upon completion of initial testing, presumptive positive specimens will be prepared for confirmatory analysis by aliquoting a portion of the specimen from the primary container into the aliquot container.

4.6.2 A bar coded label will be affixed to the aliquot container.

4.6.3 A new worklist Chain of Custody (COC) will be generated with the sample numbers of the presumptive positive samples.

4.6.4 The technician will then return the primary specimen container to the appropriate temporary storage area.

4.6.5 The presumptive positive specimens will be placed into temporary storage.

4.6.6 A Technician will retrieve the presumptive positive samples from temporary storage and perform the procedures necessary to prepare the specimens for confirmatory analysis. Extraction procedures will be performed using the approved Standard Operating Procedures (SOPs).

4.6.7 The extraction technician will then provide the prepared samples to the chromatography instrument operator.

4.6.8 The extraction technician will sign and date the worklist indicating that they removed the aliquots from temporary storage, performed the extraction, and provided the extracted samples to the chromatography instrument operator.

4.7 Confirmatory Analysis

4.7.1 The chromatography instrument operator will perform chromatographic analysis of the presumptive positive specimens. Analysis will be performed using approved SOPs.

4.7.2 At the completion of the testing procedure, the instrument operator or designee will review the data and enter the results into LIMS.

4.7.3 The instrument operator will sign and date the worklist indicating that they performed the chromatographic analysis and analyzed the data. The individual who posted results to LIMS will sign and date the worklist as well.

4.8 Certification of Analytical Data

4.8.1 A Certifying Chemist will review and approve analytical data prior to final reporting of the specimen.

4.8.2 The Certifying Chemist will review all worklists to verify that the chain of custody for each batch of samples is complete.

4.8.3 Upon approval of the analytical data, the chemist will release the results in LIMS for final reporting.

4.8.4 The Certifying Chemist will complete the chain of custody indicating that they have reviewed the analytical data and have approved it for final reporting.

4.9 Review of Toxicology Cases:

4.9.1 Results of all analyses are reviewed by a professional toxicologist. The toxicologist reviews the initial requisition which may contain additional information about the case.

4.9.2 Upon approval of the results, the forensic toxicologist will release the results in LIMS for final reporting.

4.9.3 An electronic signature of the reviewing toxicologist will be automatically attached to the final report.

4.10 File and Specimen Retention

4.10.1 Files concerning the results of specimen analysis will be retained by the Laboratory in keeping with its defined Record Retention Times.

4.10.2 Specimen retention times and conditions often vary as a result of different client needs. Specimens will be retained according to Axis's specimen retention policies and specific agreements with individual clients of Axis Forensic Toxicology.

4.11 Turn Around Time (TAT) Objectives to meet Customer Requirements

4.11.1 Specimens received from customers are to be processed, analyzed, and verified in a timely manner. The company will use appropriate resources to ensure TAT objectives are met for each customer. The following are example TATs for different specimens and are not meant to be binding objectives for the laboratory. TAT objectives may change periodically

a. Forensic Specimens (not requiring send outs or limited volume specimens) – 10 days.

4.11.2 The laboratory will work to meet the TAT objectives for each specimen type. In some cases, the laboratory may not be able to meet the TAT objectives established. In such cases, customers may be notified of the delay. The decision resides with the Lab Director, and the decision may be based on the following assessment of the situation:

a. Amount of samples that will be delayed
b. Root cause of the delay of the samples
c. Anticipated time required to alleviate the delay
d. Other extraneous factors as appropriate per each situation.

4.11.3 If notification is warranted, the Lab Director will work with the appropriate staff within the company to draft, approve, and communicate the message to affected clients.

5.0 History

The History section defines the transitions of this document and its revision history. It provides a reasonable audit trail for reviews and changes.

Version	Date	Change	Author/Reviser
1.0	08/03/2009	Reformatted, replacing document LD087.	Andrea Terrell
2.0	5/19/2011	Added section on TAT objectives and responses due to delayed processes in the lab.	Jason Bush
1.0	12/29/2017	Rebranded and rescoped for Axis	Denise Purdie Andrews
2.0	3/26/2019	Clarified processes where needed. No change to processes as outlined.	Matt Zollman

AXIS FORENSIC TOXICOLOGY	**Policy**
Title: Surveillance of Forensic Testing Capabilities	
Control #: LAB.TOX.POL.3155	Version: 2.0

1.0 Purpose

Contemporary and relevant forensic toxicological testing methods ensure responsiveness to medical examiner/coroner and law enforcement client needs while promoting the laboratory's state-of-the art scientific and technical capabilities. The objective of this policy is to set forth guidelines for the regular, systematic review of Axis Forensic Toxicology forensic toxicology testing capabilities.

2.0 Scope

The applicability of this policy encompasses stakeholders with both a business and technical scientific interest in operations. These parties include COO, Director of Operations & Product Management, Laboratory Director, Toxicologists, R&D, and Technical and Operations Managers.

3.0 Responsibility

It is the responsibility of the Directors and Toxicologists to conduct assessments and reviews of the forensic toxicology testing options (panels) provided to Axis clients. The assessments are made to determine the utility, relevance and forensic toxicological significance of the offered panels; more importantly, the reviews are intended to identify areas of need with respect to identification of emerging drugs and/or substances of forensic significance. The information provides Axis executive leadership with decision guidelines for developing screening and testing strategies for drugs and/or substances in forensic case work. These assessments do not prevent changes being made to the product offerings outside of the scheduled cycle, but only ensure that a comprehensive review is being conducted regularly.

4.0 Policy

4.1 The Directors and Toxicologists will conduct mid and end of calendar year toxicology panel assessments and reviews for relevance and toxicological significance to Axis clients (MEs, coroners and law enforcement)

4.1.1 The test panels reviewed include, but are not limited to:

- Comprehensive Panels
- Drugs of Abuse, Extended Panels
- Drugs of Abuse Panels
- Synthetic cannabinoids
- Novel Psychoactive Substances
- Designer Opioids
- Drug-Facilitated Sexual Assault

4.1.2 The criteria include:

- Analytes included
- Screening limits
- Detection limits
- Quantitation limits

4.2 In addition to relevance and significance, the assessment will consider the need for inclusion of emerging drugs and/or substances to the one or more products. Background criteria derived for inclusion into panels include, but is not exclusively limited, to the following:

- In house send out referral data (frequency and cost) for directed testing and analyses by extramural reference laboratories
- Input, feedback and inquiries by medical examiners, coroners and law enforcement agencies to Axis toxicologists
- Peer reviewed case reports and communications within the field of forensic toxicology
- Relevant epidemiological reports and alerts from agencies such as the U.S. Drug Enforcement Agency (DEA), National Forensic Laboratory Information System (NFLIS), European regulatory agencies, and national poison control centers
- Information derived from technical/scientific work groups and various committees pertinent to emerging drug trends and prevalence (SOFT, AAFS).
- New regulatory guidance

4.3 Reporting and Documentation

4.3.1 Upon completion of the review, the Lab Director will provide a written memorandum of record (MFR) to the COO detailing the findings of the assessment to be incorporated into the annual Quality Review. The MFR may indicate no immediate changes or additions are required, or alternatively, may include a recommendation for Axis to explore the addition of a drug and/or substance to an existing panel. This recommendation includes justification (financial, client need, etc.) and anticipated benefit/advantage to forensic laboratory operations.

5.0 Referenced Materials

5.1 American Board of Forensic Toxicology (ABFT) Laboratory Accreditation Manual, standard C-4

6.0 History

Version	Date	Change	Author/Reviser
1.0	05/14/2013	Original Document.	George Behonick
2.0	04/11/2016	Updated the code for the Sexual Assault panel from 70050 to 70055.	Angela Cronin
1.0	8/15/2017	Rebranded and renumbered for Axis.	Denise Purdie Andrews
2.0	4/1/2019	Updated to include additional sources of information and to add additional products to the known scope.	Denise Purdie Andrews

CLIENT GUIDE

CASE MANAGEMENT PORTAL

AXIS FORENSIC TOXICOLOGY

Client Guide

We at Axis Forensic Toxicology are proud to be your industry-leading forensic toxicology partner, approaching your forensic science needs from every angle. We're a leader in designer drug testing and research, and we've centered our work on evolving our specialized techniques for over 25 years. We offer direct contact with our laboratory experts throughout the process, and we bring unmatched accuracy, accessibility, transparency and accountability to the forefront of every client interaction. Your results and satisfaction are at the center of our mission.

At Axis, our mission is to contribute to an effective justice system that brings closure to people and communities by providing accurate, timely, and relevant toxicology results from our industry leading testing protocols, cost effective products, and access to subject matter experts. That mission starts with preparing you to submit accurate and complete testing requests, so that we can deliver your results as quickly and completely as possible. This guide should serve as a helpful reference to ensure you have the proper materials and information to collect, order, and ship the cases so that testing can begin right away! Please reach out to our subject matter experts via our website, email or telephone to get the answers you need up front, so that we can deliver the results you need. We appreciate what you are doing for our communities around the country to bring answers to those you serve and the opportunity to be your partner in this important work.

TABLE OF CONTENTS

TOXICOLOGY SUBMISSION INSTRUCTIONS

SPECIMEN COLLECTION

The selection of appropriate specimens in forensic toxicology investigations is often a major factor in determining the nature and extent of chemical involvement as a cause of death. Axis's standard testing includes blood, urine, and vitreous fluid. Other appropriate specimens, such as tissues (brain, liver, etc.), bile, and stomach contents, should be collected, if warranted, but will only be tested at the client's request. Once the specimens have been collected, properly label and seal each container.

- **Axis's recommendation for blood specimen collection:**
  - **Blood for quantitative analysis** is recommended to be obtained from a distinct peripheral anatomical site (e.g., femoral veins, iliac veins). Subclavian blood should be obtained if these peripheral sites cannot be accessed, but before a central blood specimen (e.g. heart blood) is obtained for quantitative analysis. Peripheral blood volumes are typically sufficient for presumptive screening and quantitative confirmations.
  - **Central and cavity blood** are not preferred primary collection sites for quantitative toxicology testing; however, these specimen types may serve to augment and supplement available blood volumes for testing. In some instances, these specimens may be suitable for a limited number of quantitative test procedures (e.g. Carboxy-hemoglobin, ethanol).

For deaths which have occurred in the hospital, the hospital pathology laboratory should be contacted as soon as possible to see if any ante-mortem specimens of urine, blood, serum, or plasma are available. Those specimens that require testing should also be sent for analysis (please indicate if you prefer to have the ante-mortem specimens tested rather than post-mortem specimens). The exact date and time of collection should be confirmed and indicated on the submission form. It is also important to note if any antidotes or drugs used in resuscitation were given antemortem and if urine specimens were taken with the use of a catheter and/or lidocaine local anesthetic.

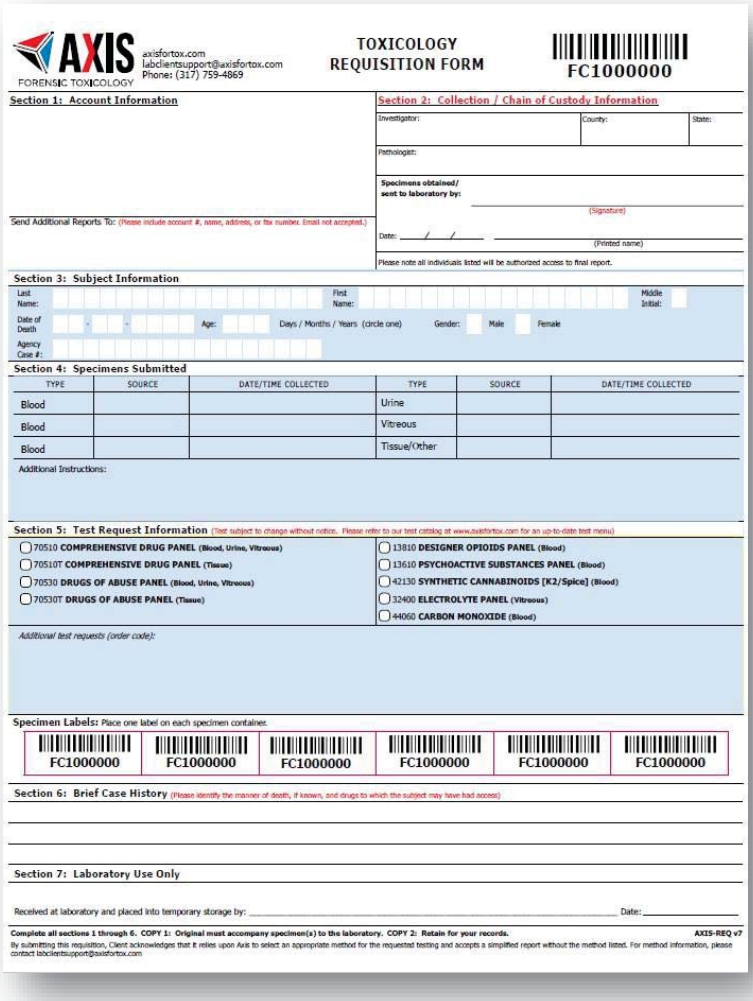
Typical collection volume requirements for various matrices are as follows:

Matrix	Specimen Volume Recommendation (Total)
Blood	10-20 mL
Urine	10 mL
Vitreous Fluid	2 mL
Tissues*	10 grams
Other Fluids*	20 mL

* When blood is not available or sufficient for the desired testing, it may be appropriate to test tissues or fluids, although the scope of analytes is not as broad (see the test catalog). Axis' toxicologists are an excellent resource for evaluating which specimens to test based on the case circumstances. Testing will be performed as ordered and begins upon receipt, so it is worthwhile to consult prior to submission.

AFTER COLLECTION

Once the specimens are collected and correctly labeled, complete the Axis Toxicology Requisition Form with the following information:



AXIS FORENSIC TOXICOLOGY
axisfortox.com
labclientsupport@axisfortox.com
Phone: (317) 759-4869

TOXICOLOGY REQUISITION FORM

FC1000000

Section 1: Account Information

Section 2: Collection / Chain of Custody Information

Investigator: | County: | State:

Pathologist:

Specimens obtained/ sent to laboratory by:

(Signature)

Send Additional Reports To: (Please include account #, name, address, or fax number. Email not accepted.)

Date: ___/___/___ (Printed name)

Please note all individuals listed will be authorized access to final report.

Section 3: Subject Information

Last Name: | First Name: | Middle Initial:

Date of Death | Age: | Days / Months / Years (circle one) | Gender: | Male | Female

Agency Case #:

Section 4: Specimens Submitted

TYPE	SOURCE	DATE/TIME COLLECTED	TYPE	SOURCE	DATE/TIME COLLECTED
Blood			Urine		
Blood			Vitreous		
Blood			Tissue/Other		

Additional Instructions:

Section 5: Test Request Information (Test subject to change without notice. Please refer to our test catalog at www.axisfortox.com for an up-to-date test menu)

- ☐ 70510 **COMPREHENSIVE DRUG PANEL** (Blood, Urine, Vitreous)
- ☐ 70510T **COMPREHENSIVE DRUG PANEL** (Tissue)
- ☐ 70530 **DRUGS OF ABUSE PANEL** (Blood, Urine, Vitreous)
- ☐ 70530T **DRUGS OF ABUSE PANEL** (Tissue)
- ☐ 13810 **DESIGNER OPIOIDS PANEL** (Blood)
- ☐ 13610 **PSYCHOACTIVE SUBSTANCES PANEL** (Blood)
- ☐ 42130 **SYNTHETIC CANNABINOIDS [K2/Spice]** (Blood)
- ☐ 32400 **ELECTROLYTE PANEL** (Vitreous)
- ☐ 44060 **CARBON MONOXIDE** (Blood)

Additional test requests (order code):

Specimen Labels: Place one label on each specimen container.

FC1000000 FC1000000 FC1000000 FC1000000 FC1000000 FC1000000

Section 6: Brief Case History (Please identify the manner of death, if known, and drugs to which the subject may have had access)

Section 7: Laboratory Use Only

Received at laboratory and placed into temporary storage by: _____ Date: _____

Complete all sections 1 through 6. COPY 1: Original must accompany specimen(s) to the laboratory. COPY 2: Retain for your records. AXIS-REQ v7

By submitting this requisition, Client acknowledges that it relies upon Axis to select an appropriate method for the requested testing and accepts a simplified report without the method listed. For method information, please contact labclientsupport@axisfortox.com

- **Section 1 - Account Information:** The agency account number and information will be pre-printed on the requisition. Account information directs where the final toxicology report should be sent and who will be billed for the toxicology services. If your agency has multiple accounts printed on the form, please select the appropriate submitting account. If additional reports need to be sent, include the name, address, fax number, or account number of the recipient(s). *Axis does not email reports for privacy reasons.*

- **Section 2 - Collection/Chain of Custody Information:** Include the signature of the individual who obtained and sent the specimen to the laboratory, and the names of the investigator and pathologist.

- **Section 3 - Subject Information:** State the subject's first and last name, middle initial, date of death, age, gender, and your agency's case number (as applicable).

- **Section 4 - Specimens Submitted:** Indicate each type of specimen submitted (blood, urine, vitreous, tissue, etc.) and list the source (e.g. femoral vein, right ventricle, hospital), and date/time collected. For testing purposes, please make sure all sample volumes meet the minimum requirement (see table on previous page).

- **Section 5 - Test Request Information:** Select the test that you would like Axis to perform. If applicable, state any additional testing you would like completed. If no test is selected, the sample will be placed on hold and an affidavit will be issued, which can delay turnaround time. See "Test Selection" below for guidance on test selection.

- **Specimen Labels:** Place one specimen label (barcode) on each specimen container.

- **Section 6 - Case History:** The following information and documentation is desirable in every case:
  - Relevant medical history with regard to prescribed medication and whether the deceased suffered from a serious infectious disease.
  - Details of any substance(s) thought to have caused death.
  - As appropriate, indicate notable case conditions (e.g. decomposed, skeletal, extensive thermal/burn injury).

Please retain the completed requisition for your records and to reference when making inquiries about your case.

TESTING SELECTION

Approaching Your Case From Every Angle

Whole Case

Axis' primary toxicology panels are setup to provide a "whole case approach" to testing. When the Comprehensive Panel or Drugs of Abuse Panel in Blood is ordered with the submission of blood, urine, and vitreous fluid, the total price of the panel will include a Basic Drugs of Abuse, Urine AND reflexed Volatiles Panel, Vitreous, if the blood is positive for alcohol.

While blood is the preferred matrix, there is significant benefit to testing multiple specimens. Testing in urine and vitreous can compensate for the quick metabolism of certain compounds such as 6-AM or the effects of decomposition on blood alcohol, and provide additional certainty in litigation.

Analyte Assurance™

A feature of Axis' Comprehensive Panels includes screening for novel substances such as Designer Opioids, Novel Psychoactives, Novel Emerging, and Synthetic Cannabinoids. If a potential positive is observed, Axis' Lab Client Support team will reach out to offer confirmatory testing. This allows our clients to:

- control the scope to what is relevant to the case
- maintain good budgetary stewardship
- move forward with additional testing without waiting for a final report on the initial panel

See more information about these specialty panels below.

When a novel substance is presumptively detected in any of the Comprehensive Panels, Analyte Assurance™ triggers outreach from our Lab Client Support team to determine whether you would like to add the relevant specialty panel. These inquiries are made by phone. Should you receive a message, we appreciate a return call to indicate yes or no. Our LCS team is also happy to answer any questions you have about additional testing or you may confer with our Toxicologists about the potential benefit of additional testing. If we do not receive an answer from you, we will mark it as No Response and finalize the case. You are always welcome to add the testing at a later date.

Specialty Testing Panels

Specialty Panels including (but not limited to) the Synthetic Cannabinoids Panel, Psychoactive Substances Panel, Novel Emerging Compounds, and Designer Opioids Panel are tested on a per specimen basis. If a blood, urine, or other specimen type are sent for this testing, each sample sent must be explicitly marked as needing testing performed. Additionally, each specimen tested with these panels will be charged for this testing.

For example, if a blood sample and urine sample are sent in with a case and the Psychoactive Substances Panel is requested for both specimens, the client will see two separate charges on the final invoice for the case – one for the Psychoactive Substances blood test and one for the Psychoactive Substances urine test.

For the most up-to-date information regarding our panels and test offerings, please see Axis' online Test Catalog at www.axisfortox.com/test_catalog.

Directed Analysis

Directed analysis for a drug or a drug class is also available.

Matrix Specific Panels – Tissue, Urine, Vitreous, Fluids
When the testing ordered is not applicable to the matrix submitted Axis will substitute the appropriate matrix-specific test unless one is not available. Additional charges may apply.

For example, if the Comprehensive Panel (OC 70510) is ordered, but only a tissue sample is sent for testing, Axis will perform testing on the tissue sample using the Comprehensive Panel, Tissue (OC 70510T) instead of the panel that was selected.

If a matrix-specific panel does not exist for the specimen submitted, Axis will contact you to inform you of the matrix-specific options that are available and request that you choose which panel would fit your case's needs. Please note this may impact turnaround time.

ADDITIONAL TEST REQUESTS

Additional testing may be added on to a case anytime during the testing process, after the final toxicology report has been released, or within the one year long-term storage period. Please contact our Lab Client Support team to request the additional testing or inquire about add-on options at www.axisfortox.com, via email at labclientsupport@axisfortox.com, or via phone at 317-759-4TOX.

SHIPPING

Each toxicology kit box submitted to Axis should contain only a single case (which includes specimens and a requisition form from one decedent/specimen donor). Combining cases in one toxicology kit box can lead to incorrect testing, slower turnaround times and specimen misplacement. Please use the provided box, seal and biohazard bag to properly secure the case for shipping.

Clients are encouraged to ship specimens as soon after collection as possible. If specimens must be stored at the collection facility, please ensure they are refrigerated. Axis accepts shipments Monday through Saturday and encourages prompt shipping of collected cases.

Axis receives the majority of its specimens after they have been shipped at ambient temperatures. If specimens are to be shipped at any temperature other than ambient, specific instructions will be prepared on a client- or project-specific basis. Please refer to our test catalog at www.axisfortox.com for special shipping requirements, if applicable.

A blood manifest must be included with each overwrap bag. *The manifest must list each requisition or case number included in the overpack bag.*

Please utilize FedEx as your primary courier for shipping specimens to Axis. Your supplies include shipping materials and prepaid Fedex labels for submitting your specimens. Please utilize them to ensure prompt and accurate delivery. If you do not have a standing Fedex pickup but anticipate sending specimens 3 or more days per week, we would be happy to assist you in setting up a standing pickup. Other options include calling for pickup or use a FedEx Drop Box. Locations can be looked up at https://local.fedex.com/.

AFFIDAVITS

An affidavit will be issued when the laboratory needs additional information regarding a case that has been received. Affidavits are faxed to the client and require a response within five (5) business days. If a response is not received after five (5) business days, the case and all of its contents will be placed into long term storage for one (1) year and a final toxicology report will be released with a "Testing not performed" notation on it. Your bill will reflect a charge for storage only, which will be credited when a testing order is received.

If you have questions regarding an affidavit your agency has received, please contact our Lab Client Support group using our website at www.axisfortox.com, via email at labclientsupport@axisfortox.com, or via phone at 317-759-4TOX.

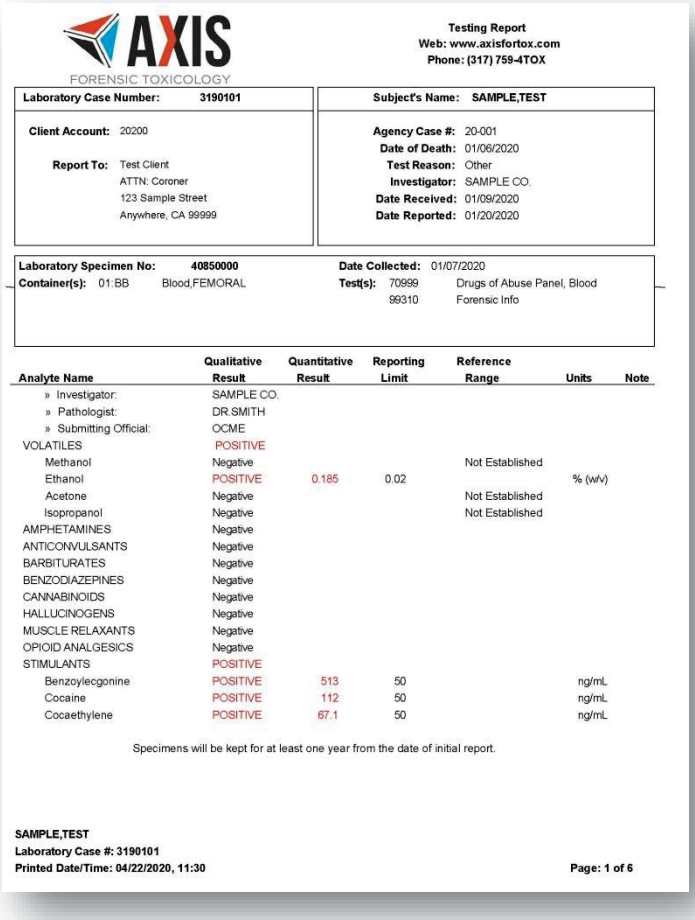
RESULTS REPORTING

Axis will release the final toxicology report once all testing has been completed, certified, and reviewed by a toxicologist. Toxicology reports from Axis contain all information provided by the client to identify the case and its source.

Information includes:

- Agency name and address of client
- Name of subject
- Case number/autopsy number
- Date of death/autopsy
- Date specimens received and date of report
- Identification of all case specimens
- Identification of testing performed (test code and test name)
- Quantitative/Qualitative test results for all case specimens
- Reference ranges (therapeutic), if available, for all test results
- Signature of certifying toxicologist

Each specimen will report on a new page for ease of review. If testing was continued from one specimen container to another, the specimen page will include a comment to that effect.



AXIS FORENSIC TOXICOLOGY

Testing Report
Web: www.axisfortox.com
Phone: (317) 759-4TOX

Laboratory Case Number: 3190101 — **Subject's Name:** SAMPLE,TEST

Client Account: 20200
Report To: Test Client, ATTN: Coroner, 123 Sample Street, Anywhere, CA 99999

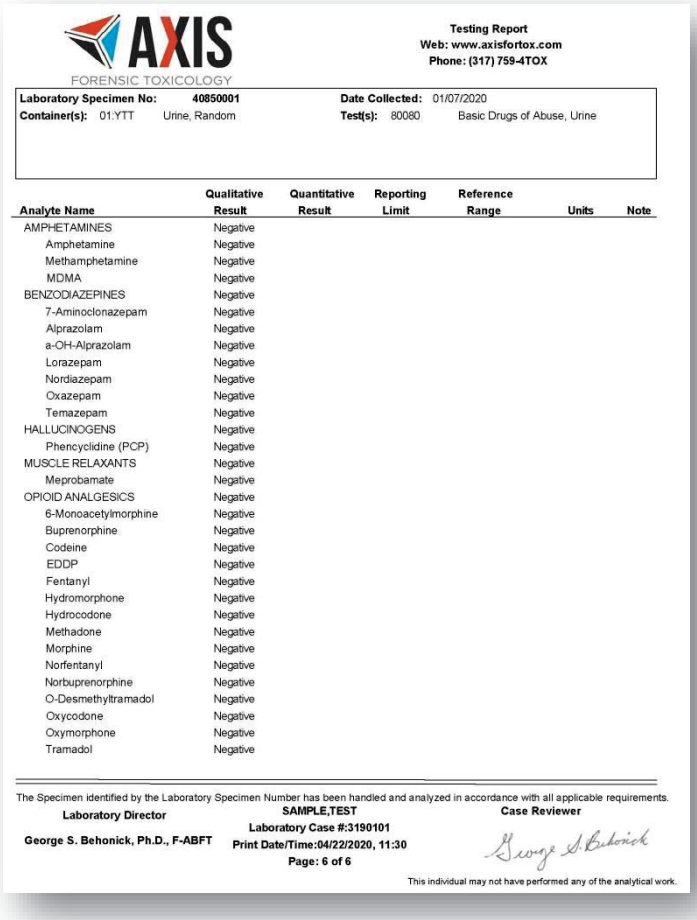
Agency Case #: 20-001
Date of Death: 01/06/2020
Test Reason: Other
Investigator: SAMPLE CO.
Date Received: 01/09/2020
Date Reported: 01/20/2020

Laboratory Specimen No: 40850000 — **Date Collected:** 01/07/2020
Container(s): 01:BB Blood,FEMORAL — **Test(s):** 70999 Drugs of Abuse Panel, Blood; 99310 Forensic Info

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
» Investigator:	SAMPLE CO.					
» Pathologist:	DR.SMITH					
» Submitting Official:	OCME					
VOLATILES	POSITIVE					
Methanol	Negative			Not Established		
Ethanol	POSITIVE	0.185	0.02		% (w/v)	
Acetone	Negative			Not Established		
Isopropanol	Negative			Not Established		
AMPHETAMINES	Negative					
ANTICONVULSANTS	Negative					
BARBITURATES	Negative					
BENZODIAZEPINES	Negative					
CANNABINOIDS	Negative					
HALLUCINOGENS	Negative					
MUSCLE RELAXANTS	Negative					
OPIOID ANALGESICS	Negative					
STIMULANTS	POSITIVE					
Benzoylecgonine	POSITIVE	513	50		ng/mL	
Cocaine	POSITIVE	112	50		ng/mL	
Cocaethylene	POSITIVE	67.1	50		ng/mL	

Specimens will be kept for at least one year from the date of initial report.

SAMPLE,TEST
Laboratory Case #: 3190101
Printed Date/Time: 04/22/2020, 11:30
Page: 1 of 6



AXIS FORENSIC TOXICOLOGY

Testing Report
Web: www.axisfortox.com
Phone: (317) 759-4TOX

Laboratory Specimen No: 40850001 — **Date Collected:** 01/07/2020
Container(s): 01:YTT Urine, Random — **Test(s):** 80080 Basic Drugs of Abuse, Urine

Analyte Name	Qualitative Result	Quantitative Result	Reporting Limit	Reference Range	Units	Note
AMPHETAMINES	Negative					
Amphetamine	Negative					
Methamphetamine	Negative					
MDMA	Negative					
BENZODIAZEPINES	Negative					
7-Aminoclonazepam	Negative					
Alprazolam	Negative					
a-OH-Alprazolam	Negative					
Lorazepam	Negative					
Nordiazepam	Negative					
Oxazepam	Negative					
Temazepam	Negative					
HALLUCINOGENS	Negative					
Phencyclidine (PCP)	Negative					
MUSCLE RELAXANTS	Negative					
Meprobamate	Negative					
OPIOID ANALGESICS	Negative					
6-Monoacetylmorphine	Negative					
Buprenorphine	Negative					
Codeine	Negative					
EDDP	Negative					
Fentanyl	Negative					
Hydromorphone	Negative					
Hydrocodone	Negative					
Methadone	Negative					
Morphine	Negative					
Norfentanyl	Negative					
Norbuprenorphine	Negative					
O-Desmethyltramadol	Negative					
Oxycodone	Negative					
Oxymorphone	Negative					
Tramadol	Negative					

The Specimen identified by the Laboratory Specimen Number has been handled and analyzed in accordance with all applicable requirements.

Laboratory Director
George S. Behonick, Ph.D., F-ABFT

SAMPLE,TEST
Laboratory Case #:3190101
Print Date/Time:04/22/2020, 11:30
Page: 6 of 6

Case Reviewer
George S. Behonick

This individual may not have performed any of the analytical work.

CASE MANAGEMENT PORTAL

Axis' Portal provides clients with a secure and easily accessible way to view the status of cases sent for testing and view/print toxicology reports that have been completed. Portal access may be requested at any time by filling out section 4a of the Account Information Form and returning it via email to supplies@axisfortox.com or faxing it to 317-481-8872. A unique web portal account will be set up for each requested user (logins should not be shared) and there is no limit to the number of accounts that can be set up. *If there is a change in personnel, please notify us so that the Portal account can be deactivated.*

After a Portal account has been set up in our system, two separate emails from **NoReply@axisfortox.com** will be sent with a web portal username and a temporary password to begin checking case status and accessing reports. *Please make sure your email provider does not flag these emails as spam.*

Once the emails are received, the portal may be accessed by going to www.axisfortox.com and clicking on "Portal" in the upper right-hand corner of our website.

Portal users will receive an email notification if there are unviewed reports. Therefore, it is very important to view all reports in the Portal. The notification includes a link to our detailed Case Management Portal User Guide. If you prefer not to receive notifications, please contact the Portal team to unsubscribe.

For additional Portal assistance or information, please contact the Portal team at www.axisfortox.com, via email at portal@axisfortox.com, or by phone at 317-759-4TOX.

AUTHORIZATION TO RECEIVE INFORMATION

Axis routinely receives inquiries from third parties for access to information and/or specimens. Axis requires a subpoena or client authorization to satisfy these requests. Authorization can be provided on the requisition form or by notifying Axis in writing. The Case Release Form is ideal for this purpose, which is available from Lab Client Support at labclientsupport@axisfortox.com.

If you have personnel changes, please complete a new Account Information Form and return it via email to supplies@axisfortox.com or fax it to 317-481-8872.

TESTING SUPPORT

LAB CLIENT SUPPORT

The Lab Client Support team is comprised of laboratory experts that can assist you when inquiring about:

- Panel/test add-ons
- Checking the status of a case in progress
- Specimen submission questions
- Test Code inquiries (for tests not found on the Test Catalog at www.axisfortox.com)
- All other testing-related inquiries

To ensure a quick and efficient process, please provide one or more of the following information when inquiring about a case:

- Your 5-digit client account number
- Subject's name
- Axis Requisition number (found in the upper right-hand corner of the requisition)
- Laboratory Case number (found at the top of completed toxicology reports)

Please contact our Lab Client Support team at www.axisfortox.com, via email at labclientsupport@axisfortox.com, or via phone at 317-759-4TOX.

TOXICOLOGISTS

Axis has board-certified toxicologists available for consultation, who are qualified as experts in numerous courts of law, including federal, state, and local courts. With collective experience in drug analysis, forensic toxicology, and forensic sciences, they have collectively testified in hundreds of cases.

Axis' toxicologists are involved with the laboratory's Research and Development department and their work has been published in distinguished scientific journals such as the American Academy of Forensic Sciences Journal of Forensic Science (JFS) and the Journal of Analytical Toxicology (JAT), and at the annual Society of Forensic Toxicologists (SOFT) Conference.

The toxicologists are available during business hours (8AM-5PM EST) and may be reached via our website at www.axisfortox.com, via email at toxicologists@axisfortox.com, or via phone at 317-759-4TOX.

TURNAROUND TIME

Axis understands that your community and families expect quick response from you and we strive to be your partner in timely service as well as quality. Specimens are processed upon receipt of complete submissions and test results are reported to the client as soon as possible. Turnaround time varies depending on the nature of the request and the amount of time required to perform testing. Typical turnaround time for cases (blood, urine, and vitreous fluid) is ten (10) business days from date of receipt.

SUPPLIES

Supplies for case submission are provided to Axis clients free of charge. Once an account has been set up with Axis, our Supply group will contact you to set up an initial supply order containing the submission containers, shipping labels, shipping bags, and requisitions to be shipped to your agency so cases may be sent to us directly.

SUPPLY QUANTITIES AND ORDERING

Some supplies may have an expiration date. To ensure the shelf life of the submission containers and the integrity of the samples submitted, the nature and quantity of the supplies provided will depend upon the type and volume of cases/specimens being sent to Axis for testing. Additional supplies may be ordered on our website at www.axisfortox.com, via email at supplies@axisfortox.com, or via phone at 317-759-4TOX.

SUBMISSION AND SHIPPING MATERIALS

Axis can provide the materials listed below in addition to the requisition form, specimen bag, security seals, specimen volume instruction sheet, and blood manifest form. Shipping materials such as FedEx PrePaid return labels and FedEx Overpak bags are also provided at no charge. FedEx Overnight service is available to arrange pick-up for you as needed. If you will be regularly submitting cases three or more days per week and do not already have a scheduled FedEx pickup, Axis can assist you in setting one up. Please refer to the Toxicology Submission Instructions in this packet for case submission instructions using these supplies.

Axis encourages the use of its standard kit, as follows, with its whole case panels to generate a more complete picture of the case:

Container Type	Description	Matrix
30 mL bottle	Sodium fluoride and EDTA preservatives	Blood/Gastric
6 mL grey top tubes	Sodium fluoride and potassium oxalate preservatives	Blood
10 mL yellow top tube	No preservative	Urine/Bile
6 mL clear top tube	No preservative	Vitreous Fluid

Axis can also provide as needed:

Container Type	Description	Matrix
30 mL bottle	No additive	Tissue
7 mL royal blue top tube	Silicone Coated, EDTA – non-metals tube for metals testing	Blood

We understand that not all toxicology case needs are the same and the supplies needed may vary depending on the type of test being requested. For that reason, Axis will work with the client to ensure the supplies shipped will meet the client's needs. Please contact our Supplies team to discuss additional supply options, including recurring/standing orders.

ADDITIONAL LABORATORY SERVICES

Axis Forensic Toxicology provides services complementary to our standard human forensic toxicology testing.

EXPERT CONSULTATION AND TESTIMONY

Axis can provide our board certified toxicologists for neutral testimony via telephone, videoconference, or in person if required by the court. Axis provides a Litigation Specialist who will assist with the needs concerning testimony (i.e. subpoenas, litigation packages, and scheduling testimony). Please email litigation@axisfortox.com or call 317-759-4TOX.

NON-ROUTINE ANALYSIS

Axis can provide non-routine and trace analysis testing for non-biological specimens such as syringes, residues, tablets, pills, capsules, liquids, or other circumstantial evidence found at the scene. Please contact Lab Client Support group on our website at www.axisfortox.com, via email at labclientsupport@axisfortox.com, or via phone at 317-759-4TOX, to receive more information.

SPECIMEN STORAGE AND RETURN

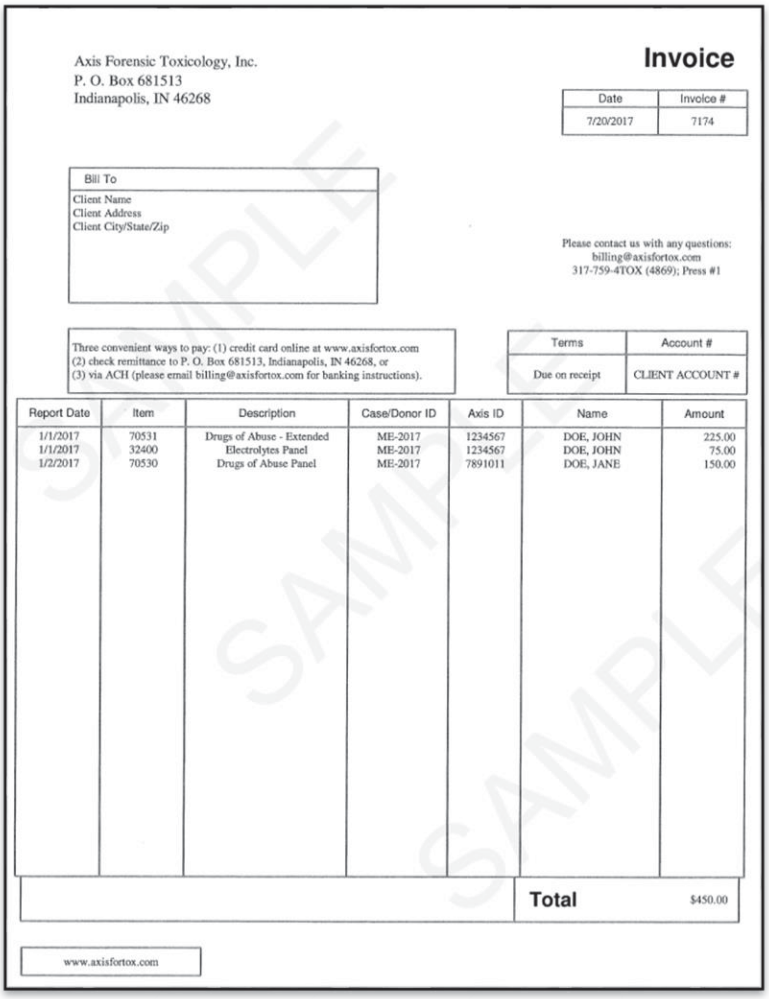
Once toxicology testing is complete, Axis will preserve the case and any remaining specimen volume that was not exhausted during testing for a minimum of one (1) year after the last toxicology report date in long term storage. Extended specimen storage is available for an additional fee. Please contact the Lab Client Support group for pricing and information regarding extended specimen storage.

Axis can also return a case and any remaining specimen volume that was not exhausted during testing (includes specimens that were submitted but not tested) to the client upon completion of testing for an additional fee. Please contact the Lab Client Support group on our website at www.axisfortox.com, via email at labclientsupport@axisfortox.com, or via phone at 317-759-4TOX, for pricing and information regarding case return.

BILLING

INVOICE DEMOGRAPHICS

Billing demographic information may be updated using Section 2 of the Axis Account Information Form. For a copy, please contact Billing via email at billing@axisfortox.com or via phone at 317-759-4TOX.



Axis Forensic Toxicology, Inc.
P. O. Box 681513
Indianapolis, IN 46268

Invoice

Date	Invoice #
7/20/2017	7174

Bill To
Client Name
Client Address
Client City/State/Zip

Please contact us with any questions:
billing@axisfortox.com
317-759-4TOX (4869); Press #1

Three convenient ways to pay: (1) credit card online at www.axisfortox.com
(2) check remittance to P. O. Box 681513, Indianapolis, IN 46268, or
(3) via ACH (please email billing@axisfortox.com for banking instructions).

Terms	Account #
Due on receipt	CLIENT ACCOUNT #

Report Date	Item	Description	Case/Donor ID	Axis ID	Name	Amount
1/1/2017	70531	Drugs of Abuse - Extended	ME-2017	1234567	DOE, JOHN	225.00
1/1/2017	32400	Electrolytes Panel	ME-2017	1234567	DOE, JOHN	75.00
1/2/2017	70530	Drugs of Abuse Panel	ME-2017	7891011	DOE, JANE	150.00

Total $450.00

www.axisfortox.com

BILLING/INVOICING

Client invoices are sent weekly for the prior week's reported cases/tests and the terms of payment are *Due Upon Receipt*. Invoices contain the following information:

- Axis' name and remittance address
- Invoice date
- Axis Client Account ID
- Name of the decedent
- Date of service (toxicology case report date)
- Laboratory order number
- Test(s) order code and description
- Charges

PAYMENT OPTIONS

Axis provides three (3) convenient ways to pay:

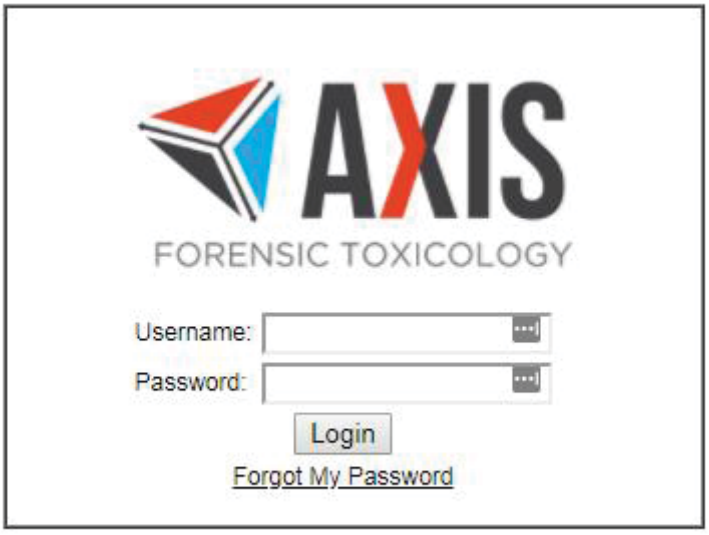
- Online via credit card by going to www.axisfortox.com and clicking on "Payments." All credit card carriers accepted.
- Check remittance to Axis Forensic Toxicology, P.O. Box 681513, Indianapolis, IN 46268.
- Via ACH/EFT payment. Please email billing@axisfortox.com or call 317-759-4TOX to set up this payment option.

All billing questions can be directed to the Billing team at billing@axisfortox.com or 317-759-4TOX.

Axis Case Management Portal Documentation

Login

In order to access the login page, click the ***PORTAL*** link at the top of the main website www.axisfortox.com.



To login, enter your username and password, and then click the ***Login*** button.

Forgotten Password

If you have forgotten your password, you can reset it from the login page. Enter your Username in the login field and click the ***Forgot My Password*** link. An email will be sent to the email address associated with the account with a temporary password. Upon logging in with this password, you will be asked to set a new permanent password. If your access has already been suspended do to multiple failed logins, you will need to contact portal@axisfortox.com, to have it reinstated.

Logout

When finished with your session, we recommend that you logout. To do this, simply click the Exit button in the upper-right corner.

Case Results

	Agency Case	Work Order	Col. Date v	Rpt. Date	Subject Name	Subject DOB	Report Status	Form
☐	123456	3152934	08/14/2018		N/G,N/G		In Progress	
☐	TESTKA	3147982	05/29/2018	05/29/2018	TESTKA,TESTKA		Report	
☐	TESTKA	3147983	05/29/2018	05/29/2018	TESTKA,TESTKA		Missing Info: AC02	
☐	N/R	3147305	05/14/2018	05/16/2018	TESTCN,TESTCN		Report	
☐	N/R	3147325	05/14/2018	05/17/2018	TESTCN,TESTCN		Report	

Once logged in, you will be presented with the main case report list and all of the search options. For easy and simple access to your results, each row represents the entire case, not just a single specimen. By default the results are sorted by Collection Date descending. Additional sorting options are explained in detail later in the ***Sorting Results*** section of this guide.

Each Case in our system is displayed with the following data points:

- Agency Case Number
  - Typically the case number from your client site.
- Work Order
  - The internal number used by Axis to track your case through the laboratory.
- Col. Date
  - The collection date of your case (format: MM/DD/YYYY)
- Rpt. Date
  - The latest report date for your case (format: MM/DD/YYYY)
- Subject Name
  - The name entered for the case, based on the information from the Requisition form (format: LAST NAME,FIRST NAME)
- Subject DOB
  - If the Subject's Date of Birth is provided, it will be listed here (format: MM/DD/YYYY)
- Report Status
  - This field has two parts: a colored circle that indicates a case's status as well as a text-based answer. If no circle is present then the case is still In Progress. A red circle  indicates the case has an active affidavit present and requires additional information. A code is also provided to indicate the nature of the affidavit. You can hover your mouse cursor over this code for more information. If an affidavit is active, a scan of the requisition form is provided in the "Form" column. A green circle  indicates that the case has been completed and the report is available for review. Click on ***Report*** to view your report.
- Form
  - In the event an affidavit is placed on your case, a link will be provided here to allow you to review the requisition form we received.

Additionally, we display any cases that have not yet been viewed as highlighted in blue. Once a report has been opened or downloaded, it will display without any highlighting, allowing you to find any unviewed cases very quickly. You may also choose to mark cases as unviewed by using the first column's checkboxes and clicking the ***Mark as UnRead*** button at the bottom of your case list. Additionally, you can choose to mark multiple cases as viewed by using the ***Print Selected*** button. This button will combine all selected cases into a single PDF file while marking them as viewed.

Searching & Filtering Results

In the Axis Case Management Portal, you can filter your results in a number of different ways:

- Searching by Date Range (Date Collected/Date Reported)
    - Enter in the start and end date (format: MM/DD/YYYY) or use the date picker to select the dates you desire for your search. Then use the radio buttons to indicate if the chosen date range is for Collection Date or Reported Date.
- Searching by Agency Case Number
    - Select "Agency Case" from the ID Type, then enter the Agency Case number in the ID Value field.
- Searching by Work Order
    - Select "Work Order" from the ID Type, then enter the Work Order number in the ID Value field.
- Searching by Requisition Number (FC******)
    - Select "Requisition" from the ID Type, then enter the Requisition number in the ID Value field.
- Searching by Subject Name
    - Enter the Subject's last name in the Subject field. All subject names are stored as LAST NAME,FIRST NAME (ex. SMITH,JOHN)
- Searching by Client/Account
    - If you have access to multiple accounts, you can select a specific account to search using the Client dropdown. You can also opt to search on All clients. If you only have access to a single account, you will not have the option to select clients.
- Searching by New/All Reports
    - Use the radio buttons to select All or New Reports.

After entering in your search criteria, click the ***Search*** button to execute your search. All search fields are optional, so you may choose to only search on one or two fields only.

Sorting Results

Column sorting is enabled for the following columns:

- Agency Case Number
- Work Order Number
- Collection Date
- Report Name
- Subject Name

You can choose to sort by any of these fields by clicking on the underlined column name. To switch sorting from descending to ascending (or vice versa) simply click the column name again.

Frequently Asked Questions

"Is there a way to turn off the unviewed email notification emails?"

Yes, we have implemented an unsubscribe list that will allow any user to opt-out of the daily unviewed report notifications. To add a user to this list, simply send an email to portal@axisfortox.com with the web portal username and/or email address associated with the case management portal account you would like to have updated.

"All of my cases are marked as viewed, but I am still getting unviewed case notifications. How do I make sure all cases have been marked as viewed?"

During the transition from a specimen-based to a case-based listing, there were some cases left in a "partially viewed" state. If you believe to have all cases marked as viewed, but you are still getting email notifications, please contact portal@axisfortox.com with the web portal username and/or email address associated and we can correct this.

"Why are some cases available to be seen with an In Progress status while others do not appear until they report out?"

You will only see cases in progress if you have access to the account under which the case was accessioned. If you are added as a "Copy To" or secondary recipient of a case, then you will only see the case report when it is complete. For example, a case that is accessioned under Account A with a copy-to of Account B will be visible right away as "In Progress" to users with access to Account A. Users with access to Account B will see the report in their portal once it has been released.

Need Help?

If you have any questions regarding your portal account, please contact us at portal@axisfortox.com or 317.759.4TOX