

Test Catalog Toxicology Laboratory

Second Edition

Toxicology Laboratory/INSPQ

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*Le répertoire des analyses du laboratoire de toxicologie
est également disponible en version française*

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**TOXICOLOGY LABORATORY/INSPQ
2705, Boul. Laurier, Local S-308
Sainte-Foy, QC G1V 4G2, Canada**

**Telephone : (Laboratory) (418) 654-2100
(Administration) (418) 654-2254
Fax : (Laboratory) (418) 654-2754
(Administration) (418) 654-2148
e-mail: (Laboratory) ctqlab@inspq.qc.ca
Web: <http://www.ctq.qc.ca>**

SECTION I : GENERAL INFORMATION

INTRODUCTION

The Toxicology Laboratory is part of the Quebec National Public Health Institute. The laboratory's primary mandate is to provide specialized analytical toxicology services to the Public Health network of the Province of Quebec.

Our analytical services are also offered to a national and international clientele.

RESOURCES

As a reference laboratory, we rely on the skills of highly competent and specialized personnel to ensure the quality of our analytical work. Our staff comprises seven chemists, of which one Ph.D. and two M.Sc. as well as 20 experienced medical technologists.

State of the art instrumental techniques including HPLC-MS, ICP-MS and GC-MS are used for the determination of trace amounts of toxic substances in biological and other matrices.

QUALITY ASSURANCE

Our laboratory has successfully undergone the accreditation process under ISO 17025.

We participate in a number of internationally recognized quality control programs, including those from : *College of American Pathologists, American Association of Bio-analysts, Centers for Disease Control, State of New York Department of Health, Finland Institute of Occupational Health, Northern Contaminants Program Interlaboratory Study and Institute for Quality Management in Medicine University of Erlangen-Nuremberg.*

We also operate several proficiency testing programs :

- ◇ The Interlaboratory Comparison Program for Trace Metals in Biological Fluids counts among its participants 170 laboratories from 21 different countries. Seventeen types of analytes are available to participants.
- ◇ The ICP-MS program allows laboratories using this analytical technique to compare their results for multielement determination in blood, urine, hair and tissues.
- ◇ A program for organochlorinated pesticides and PCBs in human plasma is aimed at laboratories performing monitoring of populations exposed to these persistent organic pollutants.

QC reference material (heavy metals in blood or urine) is available for purchase. Please contact the laboratory for details.

TYPES OF SERVICES AVAILABLE

DRUGS AND ALCOHOLS

Stat toxicology screen and/or specific analysis

A toxicology screen is performed in cases where acute poisoning by an unknown agent is suspected. These cases are usually referred by the Quebec Poison Control Centre or emergency room physicians.

A full toxicology screen requires specimens of blood, urine and gastric fluid, as some analytes are not measurable in all biological media.

Please refer to: « Substances included in the general screening of drugs and alcohols » (section III, p 35).

Stat screens are performed immediately upon sample receipt.

Results are reported by phone or fax to :

- ◇ the toxicologist, who will then contact the requesting physician **or**,
- ◇ the nurse at the Quebec Poison Control Centre, who will then contact the requesting physician **or**,
- ◇ directly to the requesting physician **or**,
- ◇ the requesting hospital's biochemistry laboratory.

General drugs screen (non-urgent)

Drugs/alcohols screen performed in either biological or non-biological (e.g.: scene residues) material. All analytes included in « Substances included in the general screening of drugs and alcohols » (Section III, p 35) can be screened for.

Analyte-specific determination (non-urgent)

Quantitative measurement of a drug substance, or its metabolite(s) in plasma. Refer to « Alphabetical listing of tests » (Section II, p 9) for substance-specific information.

Results of TDM analyses outside the therapeutic range are immediately reported to the requester via phone or fax.

Confirmation of drugs of abuse by mass spectrometry

Drugs of abuse testing is conducted according to SAMHSA guidelines. All presumptive positives are confirmed by GC-MS. Refer to « Procedure for screening and confirmation for drugs of abuse » (Section IV, p 39) for more details.

Results are reported to the requesting physician by first class mail **or**, by fax if specifically requested and authorized.

Turnaround time: The turnaround time is **generally** within seven working days (non-urgent analysis).

WORKPLACE AND ENVIRONMENTAL TOXIC SUBSTANCES

Biological monitoring of workers allows accurate evaluation of the health effects of toxic substances in the workplace. For this purpose, we measure a wide range of analytes in blood and urine, including heavy metals, solvents and their metabolites, PAHs, PCBs and pesticides.

Turnaround time: The turnaround time is **generally** within two weeks.

TRACE ELEMENTS AND HEAVY METALS BY INDUCTIVELY-COUPLED PLASMA MASS SPECTROMETRY (ICP-MS)

Complete element screens are performed in biological (urine, blood, hair, tissues) and environmental matrices (water, soil, dust, vegetation, etc).

Turnaround time: The turnaround time is **generally** within two weeks.

RARE AND UNUSUAL ANALYSES

Our full-service laboratory can respond to requests for rare and unusual toxicology analyses. Please contact the laboratory for more information.

NEW HPLC-MS-MS SERVICE

This new service is targeted at special needs where ultimate sensitivity and specificity is required, or as an alternative to classical instrumentation on difficult samples. Clients are invited to submit their projects, and refer to « Analytical development by HPLC-MS-MS » (Section V, p 45) for more detail.

BUSINESS HOURS

Regular business hours are from 8 :30 AM to 4 :30 PM (EST) Monday through Friday.

However **for stat toxicology analyses** the laboratory is open from 8 :00 AM to midnight, 365 days a year.

N.B.: In case of emergency or under exceptional circumstance, services are provided outside regular business hours. Contact the laboratory for details.

SPECIMEN COLLECTION, PRESERVATION, PACKAGING AND SHIPPING

Refer to « Sampling protocols » (Section VI, p 49) for specific information.

GENERAL PROCEDURE

Biological specimens (blood, urine, tissues) should be collected according to the appropriate protocol and unless otherwise specified, kept at 4 °C until shipped to the laboratory. Pack in adequate containers (e.g. : Polyfoam Packers Corp. 800-323-7442) and ship via courier to :

Laboratoire de Toxicologie, Local S-308

Institut national de santé publique
du Québec (INSPQ)
2705, boulevard Laurier
Sainte-Foy, QC
Canada, G1V 4G2

Acute poisoning incidents within the province of Quebec must be reported to the Quebec Poison Control Centre.

☎ (418) 656-8090 or
1-800-463-5060.

REPORTING OF RESULTS/ TURNAROUND TIMES

Results are reported to the requesting physician or laboratory by first class mail or by fax if specifically requested and authorized. Results can be transmitted by e-mail upon request.

Turnaround times will depend upon the types of requests (refer to the appropriate section on the previous page). If required, a rush service is available at extra cost. Contact the laboratory for further details.

SECTION II : ALPHABETICAL LISTING OF TESTS

ANALYTE	SPECIMEN REQUIRED	COMMENT
ACEBUTOLOL Sectral®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β-blocker and calcium channel blocker.
ACETOHEXAMIDE Dimelor®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to hypoglycemic agents.
ACETONE	Blood, 1 mL, plastic lavender	Refer to alcohol.
ACETYL-MORPHINE (6-MONO)	Urine, 20 mL	Quantitative GC-MS, heroin metabolite.
ADALAT®		Refer to nifedipine.
ALCOHOL	Blood, 1 mL, plastic lavender	Includes: acetone, ethanol, isopropanol and methanol.
ALKYL PHOSPHATES	Urine, 100 mL	Exposure to organophosphorus pesticide. Determination of dimethyl and diethyl phosphates. Contact the laboratory for details.
ALPHAPRODINE Nisentil®	Blood, 5 mL, plastic lavender	
ALPRAZOLAM Xanax®	Blood, 5 mL, plastic lavender	
ALUMINUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD 7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Dialysis fluid, 5 mL	Use a screw cap plastic (polypropylene) vial.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Plasma or serum, 6 mL, plastic lavender BD7863 or glass red top BD9615	See section 2.3 of sampling protocol for the determination of elements and trace metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
Δ-AMINOLEVULINIC ACID (ALA)	Urine, 20 mL	Add 50 µL of glacial acetic acid per 25 mL of urine.
AMITRIPTYLINE Elavil®	Blood, 5 mL, plastic lavender	
AMOBARBITAL Tuinal®	Blood, 5 mL, plastic lavender	
AMOXAPINE Asendin®	Blood, 5 mL, plastic lavender	
AMPA		Refer to glyphosate.
AMPHETAMINES AND METHAMPHETAMINES	Urine, 20 mL	Quantitative GC-MS
	Urine, 20 mL	Screening
ANAFRANIL®		Refer to clomipramine.

ANALYTE	SPECIMEN REQUIRED	COMMENT
ANTIDEPRESSANTS (SSRI) Selective serotonin re uptake inhibitors)	Blood, 5 mL, plastic lavender	Includes: fluoxetine, fluvoxamine, paroxetine and sertraline.
ANTIDEPRESSANTS TRICYCLIC	Blood, 5 mL, plastic lavender	Screening and quantitation of 12 antidepressants. Includes : amitriptyline, amoxapine, clomipramine, desipramine, doxepin, imipramine, loxapine, maprotiline, nordoxepin, nortriptyline, protriptyline, trimipramine.
	Urine, 20 mL	Screening only.
ANTIDEPRESSANTS NON-TRICYCLIC	Blood, 5 mL, plastic lavender	Includes: clozapine, moclobemide, trazodone, venlafaxine.
ANTIMONY	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, glass lavender BD7665	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
ARSENIC, NON-DIETARY (Sum of As ⁺³ , As ⁺⁵ , MAA and DMAA. Excludes the non toxic forms such as those found in seafood)	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
ARSENIC SPECIATION (As ⁺³ , As ⁺⁵ , MAA and DMAA)	Urine, 20 mL	Contact the laboratory for details.
	Water, 100 mL	Contact the laboratory for details.
ARSENIC, TOTAL	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
ASENDIN®		Refer to amoxapine.
ATENOLOL Tenormin®	Blood, 5 mL, plastic lavender	Screening only.
ATIVAN®		Refer to lorazepam.
ATRAZINE		Refer to triazine.
AVENTYL®		Refer to nortriptyline.
BARBITAL Sodic barbitone	Blood, 5 mL, plastic lavender	Refer to barbiturates.

ANALYTE	SPECIMEN REQUIRED	COMMENT
BARBITURATES	Blood, 5 mL, plastic lavender	Screening and quantitation of barbiturates. Includes : amobarbital, barbital, butabarbital, butalbital, butethal, heptabarbital, mephobarbital, pentobarbital, phenobarbital, secobarbital.
	Urine, 20 mL	Screening only.
BARIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood	Contact the laboratory for details.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine	Contact the laboratory for details.
	Water, 100 mL	Contact the laboratory for details.
BENADRYL®		Refer to diphenhydramine.
BENOMYL (exposure to)	Soil, 500 g	Determination of benomyl and carbendazim. Contact the laboratory for details.
	Urine	Refer to 5-HBC.
	Water, 500 mL	Determination of benomyl and carbendazim. Contact the laboratory for details.
BENZENE (exposure to)	Urine	Refer to t,t-muconic acid and phenol.
BENZODIAZEPINES	Blood, 5 mL, plastic lavender	Screening and quantitation of benzodiazepines. Includes : alprazolam, bromazepam, chlordiazepoxide, clobazam, clonazepam, N-1 desalkylflurazepam, desmethyldiazepam, diazepam, flurazepam, lorazepam, oxazepam, temazepam, triazolam.
	Saliva	HPLC-MS-MS.
	Urine, 20 mL	Screening only.
	Urine, 20 mL	Quantitation HPLC.
BERYLLIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
β-2 MICROGLOBULIN	Serum, 1 mL, red top BD9615	See sections 2.3 and 3 of sampling protocol for the determination of elements and trace metals in blood (p 50).
	Urine, 20 mL	See section 2.1 and 3.1 of sampling protocol for the determination of elements and trace metals in urine (p 51).
β-BLOCKER AND CALCIUM CHANNEL BLOCKER	Blood, 5 mL, plastic lavender	Quantitation of 8 β-blocking agents and calcium channel blocker: acebutolol, diltiazem, metoprolol, naldolol, nifedipine, propranolol, timolol and verapamil.
BISMUTH	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
BLOCADREN®		Refer to timolol.
BORON	Urine	Contact the laboratory for details.
BROMAZEPAM Lectopam®	Blood, 5 mL, plastic lavender	
BUTABARBITAL Butisol sodium®	Blood, 5 mL, plastic lavender	
BUTALBITAL	Blood, 5 mL, plastic lavender	
BUTETHAL	Blood, 5 mL, plastic lavender	
BUTISOL SODIUM®		Refer to butabarbital.
BUTOXYETHANOL	Vegetation, 50 g	Contact the laboratory for details.
BUTYLCELLOSOLVE	Blood, 5 mL, plastic lavender	
CADMIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
CAFFEINE	Blood, 1 mL, plastic lavender	

ANALYTE	SPECIMEN REQUIRED	COMMENT
CALCIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Water	Contact the laboratory for details.
CALCIUM ANTAGONISTS	Blood, 5 mL	Includes : diltiazem, propranolol, verapamil.
CANNABINOIDS Cannabis	Saliva	HPLC-MS-MS.
	Urine, 20 mL	Quantitation of delta 9-THC-9-carboxylic acid. Quantitative GC-MS.
	Urine, 20 mL	Screening.
CANNABIS		Refer to cannabinoids.
CARBARYL (exposure to)	Urine	Refer to naphtol.
	Water, 250 mL	Contact the laboratory for details.
CARBENDAZIM		Refer to benomyl.
CARBOCAINE®		Refer to mepivacaine.
CARBON DIOXIDE	Air	Contact the laboratory for details.
	Water	Contact the laboratory for details.
CARBOXYHEMOGLOBIN	Blood, 3 mL, plastic lavender	
CARDIZEM®		Refer to diltiazem.
CERIUM		Contact the laboratory for details.
CESIUM		Contact the laboratory for details.
CHLORCYCLIZINE	Blood, 5 mL, plastic lavender	
CHLORDIAZEPOXIDE Librium®	Blood, 5 mL, plastic lavender	
CHLOROFORM	Air	Contact the laboratory for details.
	Blood, 5 mL, plastic lavender	Contact the laboratory for details.
	Water, 10 mL	Contact the laboratory for details.
CHLOROPHENOLS	Blood, 5 mL, plastic lavender	Determination of pentachlorophenol and 2,3,4,6-tetrachlorophenol.
	Urine, 20 mL	Determination of pentachlorophenol.
CHLOROPHENOXIDES		Refer to « pesticides, chlorophenoxy ».
CHLORPROPAMIDE Diabinese®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC, refer to hypoglycemic agents.

ANALYTE	SPECIMEN REQUIRED	COMMENT
CHLORPYRIFOS	Soil, 50 g	Determination of chlorpyrifos and degradation products: 3,5,6-trichloro-2-pyridinol. Contact the laboratory for details.
	Urine 24 hour	Exposure to organophosphorus pesticide. Determination of chlorpyrifos and degradation products: 3,5,6-trichloro-2-pyridinol. Contact the laboratory for details.
	Water, 500 mL	Determination of chlorpyrifos and degradation products: 3,5,6-trichloro-2-pyridinol. Contact the laboratory for details.
CHLORSULFURON	Water, 250 mL	Refer to diuron.
CHROMIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Plasma, 1 mL, plastic lavender BD7863	See section 2.3 of the sampling protocol for the determination of elements and metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
CLOBAZAM Frisium®	Blood, 5 mL, plastic lavender	
CLOMIPRAMINE Anafranil®	Blood, 5 mL, plastic lavender	
CLONAZEPAM Rivotril®	Blood, 5 mL, plastic lavender	
CLORAZEPATE Tranxene®	Blood, 5 mL, plastic lavender	Refer to desmethyldiazepam.
	Urine, 20 mL	
CLOZAPINE Clozaril®	Blood, 5 mL, plastic lavender	
CLOZARIL®		Refer to clozapine.
COBALT	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
COCAÏNE	Blood, 5 mL, grey stopper # BD 6471	Quantitative GC-MS.
	Blood, 5 mL, plastic lavender	Screening.
	Hair	Screening.
	Saliva	HPLC-MS-MS.
	Urine, 20 mL	Quantitative GC-MS.
	Urine, 20 mL	Screening.
CODEINE	Blood, 5 mL, plastic lavender	Quantitative GC-MS.
	Urine, 20 mL	Quantitative GC-MS.
	Urine, 20 mL	Screening.
COPPER	Biologic tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Liver needle biopsy (>1 mg)	See sampling protocol for the determination of elements and trace metals in hepatic needle biopsies (p 49).
	Plasma or serum, 1 mL, plastic lavender BD7863 or red top BD9615	See section 2.3 of the sampling protocol for the determination of elements and metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
CORGARD®		Refer to naldolol.
COTININE	Blood, 5 mL, plastic lavender	Metabolite of nicotine and a marker of exposure to tobacco smoke. Quantitative HPLC-MS-MS.
	Hair	Metabolite of nicotine and a marker of exposure to tobacco smoke. Quantitative GC/MS
	Urine, 20 mL	Metabolite of nicotine and a marker of exposure to tobacco smoke. Quantitative GC/MS.
CYANIDE	Blood, 5 mL, plastic lavender	
CYCLIZINE Marzine®	Blood, 5 mL, plastic lavender	
2,4-D		Refer to « pesticides, chlorophenoxy ».
p,p'-DDE		Refer to « pesticides, organochlorinated ».
p,p'-DDT		Refer to « pesticides, organochlorinated ».
DALMANE®		Refer to flurazepam.
DARVON-N®		Refer to propoxyphene.
DELMATHRINE	Urine	Refer to « pesticides, pyrethroids ».
	Water, 500 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
DEMEROL [®]		Refer to meperidine.
DESALKYL FLURAZEPAM, N-1	Blood, 5 mL, plastic lavender	
DESIPRAMINE Norpramin [®]	Blood, 5 mL, plastic lavender	
DESMETHYLDIAZEPAM	Blood, 5 mL, plastic lavender	
	Urine, 20 mL	Quantitative HPLC.
DESYREL [®]		Refer to trazodone.
DIAβETA [®]		Refer to glyburide.
DIABINESE [®]		Refer to chlorpropamide.
DIAMICRON [®]		Refer to gliclazide.
DIAZEPAM Valium [®]	Blood, 5 mL, plastic lavender	
DICAMBA		Refer to « pesticides, chlorophenoxy ».
p-DICHLOROBENZENE (exposure to)		Refer to 2,5-dichlorophenol.
2,5-DICHLOROPHENOL	Urine, 20 mL	Exposure to p-dichlorobenzene. Contact the laboratory for details.
DICHLORPROP (Also named 2,4-DP)		Refer to « pesticides, chlorophenoxy ».
DIETHYL PHOSPHATE		Refer to alkyl phosphates.
DILTIAZEM Cardizem [®]	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β-blocker and calcium channel blocker.
DIMELOR [®]		Refer to acetohexamide.
DIMENHYDRINATE Gravol [®]	Blood, 5 mL, plastic lavender	Refer to diphenhydramine.
DIMETHYL PHOSPHATE		Refer to alkyl phosphates.
DIPHENHYDRAMINE Benadryl [®]	Blood, 5 mL, plastic lavender	
DIURON	Water, 250 mL	Determination of diuron and chlorsulfuron. Contact the laboratory for details.
DOXEPIN Sinequan [®]	Blood, 5 mL, plastic lavender	
2,4-DP (Also named dichlorprop)		Refer to « pesticides, chlorophenoxy ».
DRUGS (General screening of pharmaceuticals)	Blood, 5 mL, plastic lavender	Includes quantitative alcohol. Refer to pages 35-36.
	Gastric liquid, 20 mL	Refer to pages 35-36.
	Urine, 20 mL	Refer to pages 35-36.
DRUG SUBSTANCES (General screening of solids)	Powders, tablets	Refer to pages 35-36.

ANALYTE	SPECIMEN REQUIRED	COMMENT
DRUGS OF ABUSE (Street drugs)	Urine, 20 mL	Includes: amphetamines, benzodiazepines and barbiturates, cannabis, cocaine, opiates, phencyclidine with GC-MS confirmation. Refer to pages 40-41.
DYSPROSIUM		Contact the laboratory for details.
ECSTASY		Refer to MDMA.
EFFEXOR®		Refer to venlafaxine.
ELAVIL®		Refer to amitriptyline.
ERBIUM		Contact the laboratory for details.
ETHANOL	Blood, 1 mL, plastic lavender	Refer to alcohol.
ETHYLBENZENE (exposure to)	Urine	Refer to mandelic acid.
ETHYLENE GLYCOL	Blood, 5 mL, plastic lavender	
EUROPIUM		Contact the laboratory for details.
FLUAZIFOP	Soil, 500 g	Exposure to fluzifop-butyl (fusilade) Determination of fluzifop and fluzifop-butyl. Contact the laboratory for details.
	Urine 24 hour	Determination of fluzifop. Contact the laboratory for details.
	Water, 500 mL	Determination of fluzifop and fluzifop-butyl. Contact the laboratory for details.
FLUAZIFOP-BUTYL (Exposure to)		Refer to fluzifop.
FLUORIDE	Plasma or serum, 2 mL, plastic lavender BD7863 or red top BD9615	See section 2.3 of the sampling protocol for the determination of elements and trace metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
FLUOXETINE Prozac®	Blood, 5 mL, plastic lavender	Quantitative by GC-MS.
FLURAZEPAM Dalmane®	Blood, 5 mL, plastic lavender	
FLUVOXAMINE Luvox®	Blood, 5 mL, plastic lavender	Quantitative by GC-MS.
FRISIUM®		Refer to clobazam.
GADOLINIUM		Contact the laboratory for details.
GALLIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood	Contact the laboratory for details.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine	Contact the laboratory for details.
	Water	Contact the laboratory for details.
GAMMA-HYDROXY-BUTYRATE		Refer to GHB.

ANALYTE	SPECIMEN REQUIRED	COMMENT
GERMANIUM		Contact the laboratory for details.
GHB Gamma-hydroxy-butyrate	Urine, 20 mL	Screening by GC-MS.
GLICLAZIDE Diamicron®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to hypoglycemic agents.
GLIPIZIDE Glucotrol®	Blood, 5 mL lavender	Screening and quantitative HPLC. Refer to hypoglycemic agents.
GLUCOTROL®		Refer to glipizide.
GLUTETHIMIDE	Blood, 5 mL, plastic lavender	
GLYBURIDE DiaBeta®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC, refer to hypoglycemic agents.
GLYPHOSATE	Soil, 500 g	Determination of glyphosate and its degradation product, AMPA. Contact the laboratory for details.
	Water, 500 mL	Determination of glyphosate and its degradation product, AMPA. Contact the laboratory for details.
GOLD	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
GRAVOL®		Refer to dimenhydrinate.
HAFNIUM		Contact the laboratory for details.
HALCION®		Refer to triazolam.
5-HBC	Urine 24 hour	Exposure to benomyl. Contact the laboratory for details.
HEPTABARBITAL	Blood, 5 mL, plastic lavender	
HEROIN	Blood, 5 mL, plastic lavender	Quantitative GC-MS.
	Urine, 20 mL	Quantitative GC-MS.
2,5-HEXANEDIONE	Urine, 20 mL	Exposure to n-hexane.
n-HEXANE (Exposure to)		Refer to 2,5-hexanedione.
HEXAZINONE	Urine 24 hour	Determination of parent product and three of its metabolites. Contact the laboratory for details.
HIPPURIC ACID	Urine, 20 mL	Exposure to toluene.
HMX	Urine, 20 mL	Refer to RDX.

ANALYTE	SPECIMEN REQUIRED	COMMENT
HOLMIUM		Contact the laboratory for details.
HYDROXY PHENANTHRENES		Refer to PAH metabolites.
HYDROXYPYRENE	Urine, 100 mL	Exposure to PAHs. Determination of 1-hydroxypyrene.
HYPOGLYCEMIC AGENTS	Blood, 5 mL, plastic lavender	Includes: acetohexamide, chlorpropamide, gliclazide, glipizide, glyburide, tolbutamide.
IMIPRAMINE Tofranil®	Blood, 5 mL, plastic lavender	
INDERAL®		Refer to propranolol.
INDIUM		Contact the laboratory for details.
IODE	Blood, 6 mL, plastic lavender BD 7863	See sampling protocol for determination of elements and trace metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for determination of elements and trace metals in urine (p 51).
IRIDIUM		Contact the laboratory for details.
IRON	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Liver needle biopsy (> 1 mg)	See sampling protocol for the determination of elements and trace metals in hepatic needle biopsies (p 49).
	Water, 100 mL	Contact the laboratory for details.
ISOPTIN®		Refer to verapamil.
ISOPROPANOL	Blood, 1 mL, plastic lavender	Refer to alcohol.
	Urine, 20 mL	
KEMADRIN®		Refer to procyclidine.
LABETALOL Trandate®	Blood, 5 mL, plastic lavender	Screening only.
LANTHANIDES		Contact the laboratory for details.
LANTHANUM		Contact the laboratory for details.
LEAD	Air	Contact the laboratory for details.
	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Dust (>10 mg)	Contact the laboratory for details.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Soil	Contact the laboratory for details.
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
LEAD ISOTOPIC RATIOS	All matrices	Done by ICP-MS. Contact the laboratory for details.
LECTOPAM®		Refer to bromazepam.
LIBRIUM®		Refer to chlordiazepoxide.
LIDOCAINE	Blood, 5 mL, plastic lavender	
LITHIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
LOPRESOR®		Refer to metoprolol.
LORAZEPAM Ativan®	Blood, 5 mL, plastic lavender	
	Urine, 20 mL	Quantitative HPLC.
LOXAPINE	Blood, 5 mL, plastic lavender	
LUDIOMIL®		Refer to maprotiline.
LUTETIUM		Contact the laboratory for details.
LUVOX®		Refer to fluvoxamine.
MAGNESIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Water	Contact the laboratory for details.
MALATHION (Exposure to)	Urine	Refer to malathion mono and dicarboxylic acid.
MALATHION, MONO AND DICARBOXYLIC ACID	Urine, 24 hour	Exposure to malathion. Determination of malathion dicarboxylic acid and malathion monocarboxylic acid. Contact the laboratory for details.
MANCOZEB	Soil, 500 g	Contact the laboratory for details.
	Water, 500 mL	Contact the laboratory for details.
MANDELIC ACID	Urine, 20 mL	Exposure to ethyl benzene or styrene.
MANERIX®		Refer to moclobemide.

ANALYTE	SPECIMEN REQUIRED	COMMENT
MANGANÈSE	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for elements and trace metals in blood (p 50).
	Hair	See sampling protocol for elements and trace metals in hair (p 49).
	Serum, red top BD9615	See section 2.3 of protocol for the determination of elements and trace metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
MAPROTILINE Ludiomil®	Blood, 5 mL, plastic lavender	
MARZINE®		Refer to cyclizine.
MDMA METHYL DIOXY METHAMPHETAMINE Ecstasy®	Urine, 20 mL	Quantitative GC-MS.
MECOPROP	Urine	Refer to « pesticides chlorophenoxy ».
MEPERIDINE Demerol®	Blood, 5 mL, plastic lavender	
MEPHOBARBITAL	Blood, 5 mL, plastic lavender	
MEPIVACAINE Carbocaine®	Blood, 5 mL, plastic lavender	
MERCURY, INORGANIC	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
MERCURY, TOTAL	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
METAL SCREENING	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49). Includes: aluminum, antimony, arsenic, barium, beryllium, bismuth, calcium, cadmium, cobalt, chromium, copper, iron, gallium, gold, lanthanum, lead, lithium, magnesium, manganese, molybdenum, niobium, nickel, platinum, rubidium, selenium, silver, strontium, tellurium, thallium, tin, tungsten, uranium, vanadium, zinc, zirconium.
	Blood	See sampling protocol for the determination of elements and trace metals in blood. Includes: aluminum, antimony, arsenic, beryllium, bismuth, cadmium, cobalt, copper, lead, lithium, manganese, molybdenum, nickel, selenium, silver, tellurium, thallium, tin, uranium, zinc, zirconium.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49). Includes: idem Biological tissues.
	Serum	See section 2.3 of the sampling protocol for the determination of elements and trace metals in blood (p 50). Includes: aluminum, antimony, arsenic, beryllium, bismuth, cobalt, copper, chromium, lithium, manganese, molybdenum, nickel, selenium, silver, tellurium, thallium, tin, uranium, zinc, zirconium.
	Urine	See sampling protocol for the determination of elements and trace metals in urine (p 51). Includes: aluminum, antimony, arsenic, beryllium, bismuth, cadmium, cobalt, copper, lead, lithium, manganese, molybdenum, nickel, selenium, silver, tellurium, thallium, tin, uranium, zinc, zirconium.
	Water	Contact the laboratory for details. Includes: aluminum, antimony, arsenic, barium, beryllium, bismuth, calcium, cadmium, cobalt, chromium, copper, iron, gallium, gold, lanthanum, lead, lithium, magnesium, manganese, molybdenum, niobium, nickel, platinum, rubidium, selenium, silver, strontium, tellurium, thallium, tin, tungsten, uranium, vanadium, zinc, zirconium.
METHADONE	Blood, 5 mL, plastic lavender	
	Urine, 20 mL	Quantitative GC-MS.
METHANE	Air	Contact the laboratory for details.
	Water	Contact the laboratory for details.
METHANOL	Blood, 1 mL, plastic lavender	Refer to alcohol.
METHAQUALONE	Blood, 5 mL, plastic lavender	
METHYL CHLOROFORM (Exposure to)		Refer to trichloroacetic acid in urine and trichloroethanol in blood and urine.
METHYL ETHYL KETONE (Exposure to)	Urine, 20 mL	To avoid evaporation of the solvent, the sampling container should be filled to the brim and tightly closed.
METHYLHIPPURIC ACID	Urine, 20 mL	Exposure to xylene.
METOPROLOL Lopresor®	Blood, 5 mL, plastic lavender.	Screening and quantitative HPLC. Refer to β -blocker and calcium channel blocker.

ANALYTE	SPECIMEN REQUIRED	COMMENT
MOCLOBEMIDE Manerix®	Blood, 5 mL, plastic lavender	
MOLYBDENUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
MORPHINE	Blood, 5 mL, plastic lavender	Quantitative GC-MS.
	Saliva	HPLC-MS-MS
	Urine, 20 mL	Quantitative GC-MS.
	Urine, 20 mL	Screening.
t,t-MUCONIC ACID	Urine, 20 mL	Exposure to benzene.
NALDOLOL Corgard®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β-blocker and calcium channel blocker.
NAPHTHALENE (Exposure to)		Refer to naphtol.
NAPHTOL	Urine, 20 mL	Exposure to carbaryl or naphthalene. Determination of 1-naphtol and 2-naphtol. Contact the laboratory for details.
NARCOTICS	Urine, 20 mL	Includes : drugs of abuse, meperidine, methadone, pentazocine, propoxyphene.
NEMBUTAL®		Refer to pentobarbital.
NEODYMIUM		Contact the laboratory for details.
NICKEL	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Plasma, 1 mL, plastic lavender BD7863	See section 2.3 of the sampling protocol for the determination of elements and metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
NICOTINE	Hair	See also cotinine.
	Urine, 20 mL	See also cotinine.
NIFEDIPINE Adalat®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β -blocker and calcium channel blocker.
NIOBIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood	Contact the laboratory for details.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine	Contact the laboratory for details.
	Water, 100 mL	Contact the laboratory for details.
NISENTIL®		Refer to alphaprodine.
NORDOXEPIN	Blood, 5 mL, plastic lavender	
NORPRAMIN®		Refer to desipramine.
NORTRIPTYLINE Aventyl®	Blood, 5 mL, plastic lavender	
OLANZAPINE Zyprexa®	Blood, 5 mL, plastic lavender	Quantitative by GC-MS.
OPIATES	Blood, 5 mL, plastic lavender	Quantitative GC-MS.
	Saliva	Quantitative GC-MS.
	Urine, 20 mL	Quantitative GC-MS.
	Urine, 20 mL	Screening.
ORGANOCHLORINE COMPOUNDS		Refer to « pesticides, organochlorinated ».
ORGANOPHOSPHORUS or ORGANOPHOSPHATE COMPOUNDS		Refer to « pesticides, organophosphorus ».
ORINASE®		Refer to tolbutamide.
OSMIUM		Contact the laboratory for details.
OXAZEPAM Serax®	Blood, 5 mL, plastic lavender	
	Urine, 20 mL	Quantitative by HPLC.
PAHs Polycyclic aromatic hydrocarbons		Contact the laboratory for details.
PAH METABOLITES	Urine, 100 mL	Determination of PAHs metabolites: 1-naphtol, 2-naphtol, 1-hydroxyphenanthrene, 1-hydroxypyrene, 2-hydroxyphenanthrene, 3-hydroxyphenanthrene, 4-hydroxyphenanthrene, 9-hydroxyphenanthrene. Contact the laboratory for details.
PALLADIUM		Contact the laboratory for details.
PARAQUAT	Urine, 20 mL	Only available in case of acute intoxication. Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
PAROXETINE Paxil [®]	Blood, 5 mL, plastic lavender	Quantitative by GC-MS.
PAXIL[®]		Refer to paroxetine.
PCBs (Polychlorinated biphenyls)	Blood, 10 mL, plastic lavender	Determination of PCB congeners : 28, 52, 101, 105, 118, 128, 138, 153, 156, 170, 180, 183, 187. Determination of total PCBs as Aroclor 1260. Other congeners are quantitated upon special request. See also PCBs and organochlorinated pesticides.
PCBs AND ORGANOCHLORINATED PESTICIDES	Biological tissues, 5 g	Determination of PCB congeners : 28, 52, 99, 101, 105, 118, 128, 138, 153, 156, 170, 180, 183, 187.
	Biopsies, 1 g	Determination of total PCBs as Aroclor 1260.
	Blood, 10 mL, plastic lavender	Determination of: β -BHC, α -chlordane, γ -chlordane, cis-nonachlor, hexachlorobenzene, mirex, oxychlordane, p,p'-DDE, p,p'-DDT, trans-nonachlor, dieldrin, heptachlor epoxide. Other organochlorinated and congeners are quantitated upon special request. Contact the laboratory for details.
	Fish, 5 g	
	Milk, 20 mL	
	Placenta, 15 g	For blood, includes the above-mentioned analytes plus the determination of aldrin.
	Vegetation, 50 g	
PENTACHLOROPHENOL		Refer to chlorophenols.
PENTAZOCINE Talwin [®]	Blood, 5 mL, plastic lavender	
	Urine, 20 mL	Refer to narcotics.
PENTOBARBITAL Nembutal [®]	Blood, 5 mL, plastic lavender	
PENTOTHAL[®]		Refer to thiopental.
PERCHLORETHYLENE (Exposure to)	Urine, 20 mL	Refer to trichloroacetic acid in urine.
PESTICIDES, CHLOROPHENOXY	Berries, 25 g Twigs or vegetation, 50 g	The determination of pesticides chlorophenoxy includes salt and acid forms. The ester form will be quantitated on special request. Determination of 2,4-D and/or dicamba, and/or dichlorprop (2,4-DP) and/or picloram and/or triclopyr. Contact the laboratory for details.
	Soil, 50 g	The determination of pesticides chlorophenoxy includes salt and acid forms. The ester form will be quantitated on special request. Determination of 2,4-D and/or dicamba, and/or dichlorprop (2,4-DP) and/or picloram and/or triclopyr. Contact the laboratory for details.
	Urine 24 hour	Determination of free 2,4-D and/or picloram and/or mecoprop. Contact the laboratory for details.
	Urine 24 hour	Determination of total 2,4-D and/or picloram and/or mecoprop. Contact the laboratory for details.
	Water, 500 mL	The determination of pesticides chlorophenoxy includes salt and acid forms. The ester form will be quantitated on special request. Determination of 2,4-D and/or dicamba, and/or dichlorprop (2,4-DP) and/or picloram and/or triclopyr. Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
PESTICIDES, ORGANOCHLORINATED	Biological tissues, 5 g	Determination of β -BHC, α -chlordane, γ -chlordane, cis-nonachlor, dieldrin, heptachlor epoxide, hexachlorobenzene, mirex, oxychlordane, p,p'-DDE, p,p'-DDT, trans-nonachlor and other organochlorinated are quantitated upon special request. Contact the laboratory for details. For blood, includes above-mentioned analytes plus the determination of aldrin.
	Biopsies, 1 g	
	Blood, 10 mL	
	Fish, 5 g	
	Milk, 20 mL	
	Placenta, 15 g	
	Vegetation, 50 g	
PESTICIDES, ORGANOPHOSPHORUS	Soil	Refer to chlorpyrifos.
	Urine	Refer to chlorpyrifos and alkyl phosphates.
	Water	Refer to chlorpyrifos.
PESTICIDES, PYRETHROIDS	Urine 24 hour	Determination of cis-Cl ₂ CA, trans-Cl ₂ CA, Br ₂ CA and 3-PBA. Contact the laboratory for details.
	Water, 500 mL	Refer to deltamethrine.
PETHIDINE	Blood, 5 mL, plastic lavender	Refer to meperidine.
PHENCYCLIDINE (PCP)	Blood, 5 mL, plastic lavender	Screening.
	Blood, 5 mL, plastic lavender	Quantitative GC-MS.
	Urine, 20 mL	Quantitative GC-MS.
	Urine, 20 mL	Screening.
PHENOBARBITAL	Blood, 5 mL, plastic lavender	
PHENOL	Urine, 20 mL	Exposure to benzene or phenol.
PHENOTHIAZINE	Blood, 5 mL, plastic lavender	Screening only.
	Gastric liquid, 20 mL	Screening only.
	Urine, 20 mL	Screening only.
PHENYLGLYOXYLIC ACID (Exposure to styrene)	Urine, 20 mL	Contact the laboratory for details.
PICLORAM		Refer to « pesticides, chlorophenoxy ».
PINDOLOL Visken [®]	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β -blocker and calcium channel blocker.
PLATINUM		Contact the laboratory for details.
POLYCHLORINATED BIPHENYLS		Refer to PCBs.
POPs (Persistent organic pollutants)		Refer to PCBs and organochlorinated pesticides.
PRASEODYMIUM		Contact the laboratory for details.
PROCYCLIDINE Kemadrin [®]	Blood, 5 mL, plastic lavender	
PROMETHIUM		Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
PROPRANOLOL Inderal®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β -blocker and calcium channel blocker.
PROPOXYPHENE Darvon-N®	Blood, 5 mL, plastic lavender	
PROTRIPTYLINE Triptil®	Blood, 5 mL, plastic lavender	
PROZAC®		Refer to fluoxetine.
RBP		See retinol binding protein.
RDX	Urine, 20 mL	Determination of RDX and HMX. Contact the laboratory for details.
RETINOL BINDING PROTEIN	Urine, 20 mL	Cadmium exposure. Contact the laboratory for details.
	Serum	Contact the laboratory for details.
RESTORIL®		Refer to temazepam.
RHENIUM		Contact the laboratory for details.
RHODIUM		Contact the laboratory for details.
RIVOTRIL®		Refer to clonazepam.
RUBIDIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood	Contact the laboratory for details.
	Hair	See sampling protocol for determination of elements and trace metals in hair (p 49).
	Urine	Contact the laboratory for details.
	Water	Contact the laboratory for details.
RUTHENIUM		Contact the laboratory for details.
SAMARIUM		Contact the laboratory for details.
SCANDIUM		Contact the laboratory for details.
SECOBARBITAL Seconal®	Blood, 5 mL, plastic lavender	
SECONAL®		Refer to secobarbital.
SELENIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender, BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Plasma or serum, 1 mL, plastic lavender BD7863 or red top BD9615	See section 2.3 of the sampling protocol for the determination of elements and metals in blood (p 50).

ANALYTE	SPECIMEN REQUIRED	COMMENT
SELENIUM (Concluded)	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
SECTRAL®		Refer to acebutolol.
SERAX®		Refer to oxazepam.
SERTRALINE Zoloft®	Blood, 5 mL, plastic lavender	Quantitative by GC-MS.
SILICON		Contact the laboratory for details.
SILVER	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water, 100 mL	Contact the laboratory for details.
SIMAZINE		Refer to triazine.
SINEQUAN®		Refer to doxepin.
SODIUM		Contact the laboratory for details.
SOLVENTS (Volatile)	Blood, 5 mL	Contact the laboratory for details.
STRONTIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood	Contact the laboratory for details.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine	Contact the laboratory for details.
	Water	Contact the laboratory for details.
STYRENE (Exposure to)		Refer to mandelic acid.
SURMONTIL®		Refer to trimipramine.
TALWIN®		Refer to pentazocine.
TANTALUM		
TEBUTHIURON	Soil, 500 g	Determination of tebuthiuron and N-desmethyl tebuthiuron metabolite. Contact the laboratory for details.
	Water, 500 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
TELLURIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
TEMAZEPAM Restoril®	Blood, 5 mL, plastic lavender	
	Urine, 20 mL	Quantitative HPLC.
TENORMIN®		Refer to atenolol.
TERBIUM		Contact the laboratory for details.
2,3,4,6-TETRACHLOROPHENOL		Refer to chlorophenols.
THALLIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
THIOCYANATE	Blood, 5 mL, plastic lavender	
THIOPENTAL Pentothal®	Blood, 5 mL, plastic lavender	
THORIUM		Contact the laboratory for details.
THULIUM		Contact the laboratory for details.
TIMOLOL Blocadren®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β -blocker and calcium channel blocker.
TIN	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
TITANIUM	Hair	Contact the laboratory for details.
TOFRANIL®		Refer to imipramine.

ANALYTE	SPECIMEN REQUIRED	COMMENT
TOLBUTAMIDE Orinase®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to hypoglycemic agents.
TOLUENE (Exposure to)		Refer to hippuric acid.
TOXAPHENE	Biological tissues, 5 g	Determination of commercially available congeners and total toxaphene. Contact the laboratory for details.
	Blood, 10 mL, plastic lavender	Determination of commercially available congeners and total toxaphene. Contact the laboratory for details.
TRANDATE®		Refer to labetalol.
TRANXENE®		Refer to clorazepate.
TRAZODONE Desyrel®	Blood, 5 mL, plastic lavender	
TRIAZINE	Soil, 500 g	Determination of atrazine or simazine and their metabolites. Contact the laboratory for details.
	Urine 24 hour	Determination of atrazine or simazine and their metabolites. Contact the laboratory for details.
	Water, 500 mL	Determination of atrazine or simazine and their metabolites. Contact the laboratory for details.
TRIAZOLAM Halcion®	Blood, 5 mL, plastic lavender	
3,5,6-TRICHLORO-2-PYRIDINOL	Soil	Refer to chlorpyrifos.
	Urine	Refer to chlorpyrifos.
	Water	Refer to chlorpyrifos.
TRICHLOROACETIC ACID	Berries, 25 g	Used as pesticide. Contact the laboratory for details.
	Soil, 500 g	Used as pesticide. Contact the laboratory for details.
	Urine, 20 mL	Exposure to methyl chloroform [1,1,1-trichloroethane], perchloroethylene or trichloroethylene.
	Water, 500 mL	Used as pesticide. Contact the laboratory for details.
TRICHLOROPYRIDINOL		Refer to chlorpyrifos.
1,1,1-TRICHLOROETHANE (Exposure to)		Refer to trichloroacetic acid in urine and trichloroethanol in blood and urine.
TRICHLOROETHANOL	Blood, 5 mL, plastic lavender	Exposure to 1,1,1-trichloroethane (methyl chloroform) or trichloroethylene. Ingestion of chloral hydrate.
	Urine, 20 mL	Exposure to 1,1,1-trichloroethane (methyl chloroform) or trichloroethylene exposure.
TRICHLOROETHYLENE (Exposure to)		Refer to trichloroacetic acid in urine and trichloroethanol in blood and urine.
TRICLOPYR		Refer to pesticides chlorophenoxy and triclopyr (2-butoxyethyl) ester.
TRICLOPYR (2-BUTOXY-ETHYL) ESTER	Soil, 500 g	Contact the laboratory for details.
	Twigs, 50 g	Contact the laboratory for details.
	Water, 500 mL	Contact the laboratory for details.

ANALYTE	SPECIMEN REQUIRED	COMMENT
TRIMETHYLAMINE	Water, 20 mL	Contact the laboratory for details.
TRIMETHYLAMINE OXIDE	Water, 20 mL	Contact the laboratory for details.
TRIMIPRAMINE Surmontil®	Blood, 5 mL, plastic lavender	
TRIPTIL®		Refer to protriptyline.
TUINAL®		Refer to amobarbital.
TUNGSTEN	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood	Contact the laboratory for details.
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine	Contact the laboratory for details.
	Water	Contact the laboratory for details.
URANIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
VALIUM®		Refer to diazepam.
VANADIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Water	Contact the laboratory for details.
VENLAFAXINE Effexor®	Blood, 5 mL, plastic lavender	
VERAPAMIL Isoptin®	Blood, 5 mL, plastic lavender	Screening and quantitative HPLC. Refer to β -blocker and calcium channel blocker.
VISKEN®		Refer to pindolol.
VITAMIN A	Blood, 5mL, heparin	See sampling protocol for the determination vitamin A and vitamin E (p 51).
VITAMIN E	Blood, 5 mL, heparin	See sampling protocol for the determination vitamin A and vitamin E (p 51).
XANAX®		Refer to alprazolam.
XYLENE (exposure to)		Refer to methylhippuric acid.

ANALYTE	SPECIMEN REQUIRED	COMMENT
YTTERBIUM		Contact the laboratory for details.
YTTRIUM		Contact the laboratory for details.
ZINC	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Plasma or serum, 2 mL, plastic lavender BD7863 or red top BD9615	See section 2.3 of the sampling protocol for the determination of elements and trace metals in blood (p 50).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
ZINC PROTOPORPHYRIN	Blood, 6 mL, plastic lavender BD7863	
ZIRCONIUM	Biological tissues	See sampling protocol for the determination of elements and trace metals in biological tissues (other than biopsies) (p 49).
	Blood, 6 mL, plastic lavender BD7863	See sampling protocol for the determination of elements and trace metals in blood (p 50).
	Hair	See sampling protocol for the determination of elements and trace metals in hair (p 49).
	Urine, 20 mL	See sampling protocol for the determination of elements and trace metals in urine (p 51).
	Water	Contact the laboratory for details.
ZOLOFT®		Refer to sertraline.
ZPP		Refer to zinc protoporphyrin.
ZYPREXA®		Refer to olanzapine.

**SECTION III : SUBSTANCES INCLUDED IN THE GENERAL
SCREENING OF DRUGS AND ALCOHOLS**

SUBSTANCES INCLUDED IN THE GENERAL SCREENING OF DRUGS AND ALCOHOLS

Acebutolol	GF	PI	Ur	Dimethothiazine	GF		
Acetaminophen	GF	PI	Ur	Diphenhydramine	GF	PI	Ur
Acetone		PI	Ur	Diphenylhydantoin	GF	PI	
Acetylsalicylic acid	GF	PI ¹	Ur ¹	Diphenylpyraline	GF		
Alphaprodine	GF	PI	Ur	Disopyramide	GF	PI	
Alprazolam	GF	PI		Doxepine	GF	PI	
Amitriptyline	GF	PI	Ur	Doxylamine	GF		
Amobarbital	GF	PI	Ur	Ephedrine	GF		Ur
Amoxapine	GF	PI		Etafedrine	GF		
Amphetamines	GF		Ur	Ethanol		PI	Ur
Anileridine	GF	PI	Ur	Ethoheptazine	GF		
Atenolol	GF	PI		Ethopropazine	GF		Ur
Barbital	GF	PI	Ur	Ethosuximide	GF	PI	
Benzocaine	GF			Fenfluramine	GF	PI	
Benztropine	GF		Ur	Fentanyl	GF		
Bromazepam	GF	PI		Flecainide	GF	PI	
Bromdiphenhydramine	GF			Flunitrazepam	GF	PI	
Brompheniramine	GF			Fluoxetine	GF	PI	Ur
Bupropion	GF	PI		Fluphenazine	GF		Ur
Butabarbital	GF	PI	Ur	Flurazepam	GF	PI ⁸	Ur ⁸
Butalbital	GF	PI	Ur	Fluvoxamine	GF	PI	Ur
Butethal	GF	PI	Ur	Glutethimide	GF	PI	
Caffeine	GF	PI	Ur	Haloperidol	GF		
Caramiphene	GF			Heptabarbital	GF	PI	Ur
Carbamazepine	GF	PI		Heroin	GF ⁵	PI	Ur
Carbinoxamine	GF			Hydrocodone	GF	PI	Ur
Carbromal	GF			Hydromorphone	GF		
Chlophedianol	GF			Hydroxyzine	GF		
Chlorcyclizine	GF	PI		Imipramine	GF	PI	Ur
Chlordiazepoxide	GF	PI	Ur ⁸	Isopropanol		PI	Ur
Chloroquine		WB		Ketamine	GF	PI	Ur
Chlorothene	GF			Ketazolam	GF ⁴	PI ⁸	
Chlorphentermine	GF	PI		Levallorphan	GF		
Chlorpromazine	GF	PI	Ur	Levorphanol	GF		
Chlorprothixene	GF	PI		Lidocaine	GF	PI	
Clemastine	GF			Lorazepam	GF	PI	Ur
Clobazam	GF	PI	Ur	Loxapine	GF	PI	
Clomipramine	GF	PI	Ur	Maprotiline	GF	PI	Ur
Clonazepam	GF	PI		Mazindol	GF		
Clorazepate	GF ²	PI ⁸	Ur ⁸	MDMA (Ecstasy)	GF	PI	Ur
Clozapine	GF	PI	Ur	Meperidine	GF	PI	Ur
Cocaine	GF		Ur	Mephentermine	GF		Ur
Codeine	GF	PI	Ur	Mephobarbital	GF	PI	Ur
Cyclizine	GF	PI		Mepivacaine	GF	PI	
Cyclopentamine	GF			Meprobamate	GF	PI	Ur
Cyproheptadine	GF			Mepyramine	GF		
Desipramine	GF	PI	Ur	Mescaline	GF		Ur
Dexbrompheniramine	GF ⁶			Mesoridazine	GF		Ur
Dexchlorpheniramine	GF ⁷			Methadone	GF	PI	Ur
Dextromethorphan	GF		Ur	Methamphetamine	GF		Ur
Diazepam	GF	PI	Ur ⁸	Methanol		PI	Ur
Diethylpropion	GF		Ur	Methapyrilene	GF	PI	
Diltiazem	GF	PI	Ur	Methaqualone	GF	PI	Ur
Dimenhydrinate	GF ³	PI	Ur ³	Methdilazine	GF		Ur

Methotrimeprazine	GF	PI	Ur	Temazepam	GF	PI	Ur
Methoxyphenamine	GF			Tetracaine	GF		
Methsuximide	GF			Theophylline	GF	PI	Ur
Methylphenidate	GF			Thiethylperazine	GF		Ur
Methypylone	GF	PI	Ur	Thioridazine	GF	PI	Ur
Methyl salicylate	GF	PI ¹	Ur ¹	Tranlycypromine	GF		
Metoprolol	GF	PI	Ur	Trazodone	GF	PI	
Midazolam	GF	PI		Triazolam	GF	PI	Ur
Moclobemide	GF	PI	Ur	Trifluoperazine	GF		Ur
Morphine	GF			Triflupromazine	GF		Ur
Nalorphine	GF			Trihexyphenidyle	GF		Ur
Nicotine		PI	Ur	Trimeprazine	GF		
Nifedipine	GF	PI		Trimipramine	GF	PI	Ur
Nitrazepam	GF	PI		Tripelennamine	GF	PI	
Nortriptyline	GF	PI	Ur	Tripolidine	GF		
Olanzapine	GF	PI	Ur	Venlafaxine	GF	PI	Ur
Oxazepam	GF	PI	Ur	Verapamil	GF	PI	Ur
Oxycodone	GF						
Oxymorphone	GF						
Oxyphenbutazone	GF						
Pargyline	GF		Ur				
Paroxetine	GF	PI	Ur				
Pentazocine	GF		Ur				
Pentobarbital	GF	PI	Ur				
Pericyazine	GF		Ur				
Perphenazine	GF						
Phenazocine	GF						
Phencyclidine	GF	PI	Ur				
Phendimetrazine	GF						
Pheniramine	GF						
Phenmetrazine	GF	PI					
Phenobarbital	GF	PI	Ur				
Phentermine	GF	PI					
Phenylbutazone	GF						
Phenylpropranolamine	GF		Ur				
Phenyltoloxamine	GF						
Prilocaine	GF						
Primidone	GF	PI					
Procaine	GF	PI					
Prochlorperazine	GF		Ur				
Procyclidine	GF	PI	Ur				
Promazine	GF	PI	Ur				
Promethazine	GF						
Propanol		PI	Ur				
Propranolol	GF						
Propoxyphene	GF	PI	Ur				
Protriptyline	GF	PI	Ur				
Pyrrobutamine	GF						
Quinidine	GF	PI					
Quinine	GF	PI					
Salicylic acid	GF	PI	Ur				
Secobarbital	GF	PI	Ur				
Sertraline	GF	PI	Ur				
Strychnine	GF	PI					

LEGEND:

GF : Gastric fluid

PI : Plasma

WB: Whole blood

Ur : Urine

¹: Identified as salicylic acid

²: Identified as desmethyldiazepam

³: Identified as diphenhydramine

⁴: Identified as diazepam and desmethyldiazepam

⁵: See morphine

⁶: Identified as brompheniramine

⁷: Identified as chlorpheniramine

⁸: Identified as the metabolite

N.B. Some products ingested in therapeutic doses may not be detected.

**SECTION IV : PROCEDURE FOR SCREENING AND
CONFIRMATION FOR DRUGS OF ABUSE IN URINE**

PROCEDURE FOR SCREENING AND CONFIRMATION FOR DRUGS OF ABUSE IN URINE

The laboratory performs the screening and GC/MS confirmation of drugs of abuse in urine. The request must originate from a physician who agrees to act as a review officer. Results will be transmitted solely to this physician.

Testing is conducted according to SAMHSA (Substance Abuse and Mental Health Services Administration) as published in the Federal Register 1993, 58(14):6062-6072. "Mandatory Guidelines for Federal Workplace Drug Testing Programs".

SUBSTANCES INCLUDED

Amphetamines, cannabinoids, cocaine, phencyclidine, opiates, benzodiazepines and barbiturates.

The laboratory will respond to inquiries regarding other drugs. Contact the laboratory for details.

COLLECTION PROCEDURES

The urine collection procedures Guideline (reverse side) summarizes the way to collect the urine specimen and ensure its integrity.

RECEIPT AND HANDLING OF URINE SPECIMEN

The laboratory maintains an internal chain of custody form and keeps all specimens under lock and key considering the forensic issues involved. Clients are required to maintain the chain of custody form.

CONFIRMATION OF POSITIVE RESULTS

Positives are automatically confirmed by GC/MS.

DETECTION TIMES FOR DRUGS OF ABUSE IN URINE

Product	Usual metabolite	Detection time (days)	Detection cut-off
Amphetamines	Amphetamine	1 day	300 ng/mL
Cannabinoids	11-NOR- Δ^9 -THC-COOH	5 days and more	100 ng/mL
Cocaine	Benzoyllecgonine	1 to 2 days	300 ng/mL
Phencyclidine	Phencyclidine	10 days and more	25 ng/mL
Opiates	Morphine	1 to 4 days	300 ng/mL
Benzodiazepines	Nordiazepam	1 to 2 days	300 ng/mL
Barbiturates	Secobarbital	5 to 7 days	300 ng/mL

URINE COLLECTION PROCEDURE GUIDELINES AND CHAIN OF CUSTODY FOR THE SCREENING OF DRUGS OF ABUSE

MATERIAL

Doxtech^{®*} urine collection kits :

- Collection bottle
- Special lid
- ID labels
- Temperature sensor

* www.doxtech.com

PHYSICIAN RELEASE STATEMENT

Important: **The request must originate from a physician or an authorized representative. Results will be transmitted solely to the requesting physician.**

PRECAUTIONS

Before proceeding with the urine collection, the collector must verify that :

- No adulteration or tampering took place.
- No water source is available in the collection room.

SAMPLE COLLECTION

- Fill out the plastic ID label with pencil (not ink) and place it inside the bottle with printed side **out**.
- The donor is then given the bottle and asked to produce a 30 mL urine sample, which must be **immediately** submitted to the collector.
- The collector then checks the sample for appearance and **seals the bottle with the special closure until it “snaps” tight**.
- The temperature is then read on the sensor: the reading should be in the acceptable range of 32 – 38 °C. The temperature along with any other pertinent data should be consigned on the chain of custody form.
- Finally, the exterior label should be filled out and applied to the side of the bottle.

CHAIN OF CUSTODY FORM

An external chain of custody form must be filled out and detail the following items:

- Name of donor, file #, time and date, urine temperature, name of physician, name of collector and comments if necessary.

Finally both collector and donor must sign the form.

SPECIFIC SCREENING FOR DRUGS OF ABUSE

AMPHETAMINES

d,l-Amphetamine
l-Amphetamine
d-Amphetamine
d,l-Methamphetamine
l-Methamphetamine
d-Methamphetamine
MDA
MDMA (Ecstasy)
MDE

CANNABINOIDS

11-NOR- Δ^9 -THC-COOH
8 β -11-Dihydroxy- Δ^9 -THC
8 β -Hydroxy- Δ^9 -THC
11-Hydroxy- Δ^9 -THC
 Δ^9 -THC

COCAINE

Benzoyllecgonine
Ecgonine methyl ester
Cocaine

PHENCYCLIDINE

Phencyclidine
4-OH pip PCP
TCP

OPIATES

Codeine
Diacetylmorphine
Dihydrocodeine
Dihydromorphine
Heroin

Hydrocodone
Hydromorphone
Levorphanol
Morphine
Morphine-3- β -glucuronide
Oxycodone
Oxymorphone
6-Monoacetylmorphine

BENZODIAZEPINES

Alprazolam
Bromazepam
Chlordiazepoxide
Clonazepam
N-1 Desalkylflurazepam
Diazepam
Flunitrazepam
Flurazepam
Lorazepam
Nitrazepam
Desmethylchlordiazepoxide
Oxazepam
Temazepam
Triazolam

BARBITURATES

Aprobarbital
Barbital
Butabarbital
Butalbital
Amobarbital
Pentobarbital
Secobarbital
Mephobarbital
Heptabarbital

**SECTION V : ANALYTICAL DEVELOPMENT
BY HPLC-MS-MS**

ANALYTICAL DEVELOPMENT BY HPLC-MS-MS

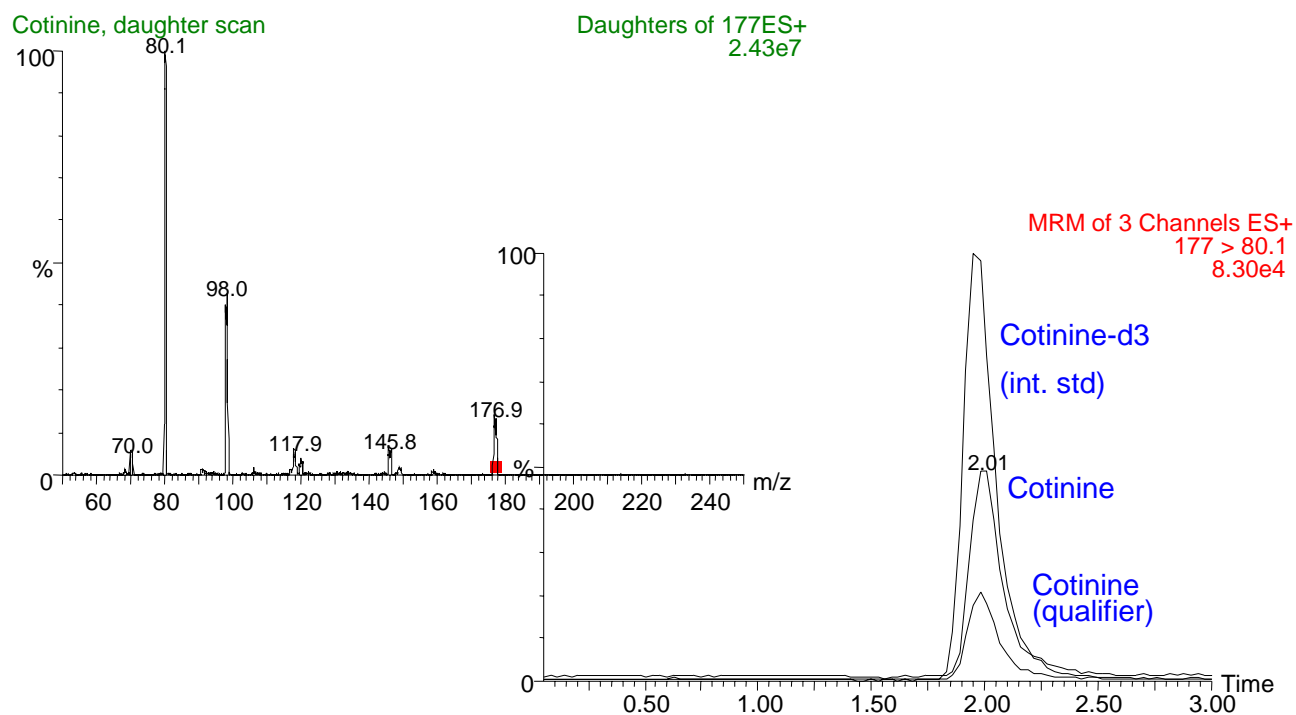
Our laboratory is now equipped with LC/MS/MS, the technique of high performance liquid chromatography-tandem mass spectrometry. With this new technology, a product of the most recent advances in analytical instrumentation, we are able to offer new analytical services and a wider range of analytes. Our clients will benefit from this technique in the following way:

- The main advantages offered by LC/MS/MS are the added sensitivity and specificity. We are able to confirm the presence of an analyte at very low concentrations. Detection limits are much improved compared to conventional techniques. Further, this detector is much more specific, a result of the use of two mass spectrometers in tandem. Thus we are now able to reach lower concentrations and with greater reliability.

With this instrument, we have a new and very powerful tool to answer special analytical requests in clinical, environmental, industrial hygiene and forensic work areas in relation with public health and **toxicology**. Our LC/MS/MS service is available for analytical development and small/large batch of sample analysis.

At the present time we will not resort to LC/MS/MS in regular analytical work, where classical instruments perform adequately. Nevertheless clients interested in submitting a special project are strongly invited to contact us.

HPLC-MS-MS daughter spectrum of cotinine (nicotine metabolite) and a chromatogram of a 2 ng/mL cotinine serum extract



SECTION VI : SAMPLING PROTOCOLS

SAMPLING PROTOCOL FOR THE DETERMINATION OF ELEMENTS AND TRACE METALS IN BIOLOGICAL TISSUES (OTHER THAN BIOPSIES)

1. Material:

- Polypropylene (Nalgene bottle 125 mL # 2104-0004)
- Cooler with "Ice-Pak[®]" for transportation

2. Sampling:

- Collect at least 2 g of tissue and place in a polypropylene (Nalgene bottle).

3. Storage:

Store samples at 4 °C.

SAMPLING PROTOCOL FOR THE DETERMINATION OF ELEMENTS AND TRACE METALS IN HEPATIC NEEDLE BIOPSIES

1. Material:

- Polypropylene 7 mL screw cap tubes, (Sarstedt # 60550) or plain vacutainer (Becton-Dickinson) without anticoagulant
- Cooler with "Ice-Pak[®]".

2. Sampling:

- Retrieve a minimum of 1 mg of tissue. More is preferred.
- Place biopsy tissue in either the polypropylene tube or the vacutainer.
- **Do not add anything to the sample such as water, formaldehyde, etc.**
- **Do not fix the tissue.**

3. Storage:

Maintain at 4 °C until shipped.

SAMPLING PROTOCOL FOR THE DETERMINATION OF ELEMENTS AND TRACE METALS IN HAIR

1. Material:

- Stapler
- Cardboard paper (12 x 20 cm approx.)
- Plastic bags (e.g. Ziploc[®])

2. Procedure:

It is recommended to wash the hair with a mild shampoo prior to sampling to eliminate gross external contamination.

Cut a strand of hair as close to the scalp as possible. The strand should be at least 0,5 cm in diameter. Collect a sample in the upper neck region.

Using a stapler (do not use adhesive tape) fix the strand onto the cardboard paper. Indicate which end of the strand is the root.

Clearly identify the sample. Provide any relevant information regarding the types of shampoos or conditioners used and also special colour treatments, perms, etc.

Insert the cardboard paper with the sample inside into the plastic bag and close tightly.



3. Storage:

Store at room temperature inside the plastic bag.

SAMPLING PROTOCOL FOR THE DETERMINATION OF ELEMENTS AND TRACE METALS IN BLOOD

1. Material:

- Sampling tubes (Becton-Dickinson, Vacutainer, Hemogard).
- Plastic transfer tubes (Sarstedt # 60550).
- Plastic transfer pipets.
- Cooler with "Ice-Pak[®]" for transportation.

2. Sampling:

2.1 Recommended tubes

ANALYTE		PLASTIC	GLASS			
		Plasma/Blood Lavender #7863	Serum Red #9615 (without clot activator)	Plasma/Blood Lavender #7665	Serum Royal Blue #9737 (without anticoagulant)	Plasma/Blood Royal Blue #9736
Aluminum ^(R) (S/P) B*	Al	√	√		√	
Antimony (S/P/B)	Sb		√	√	√	
Arsenic B*	As	√		√		
β ₂ microglobulin (S)	β ₂		√		√	
Beryllium (S/P/B)	Be	√	√	√	√	
Bismuth (S/P/B)	Bi	√	√	√	√	
Cadmium (B)	Cd	√		√		√
Chromium ^(R) (S/P)	Cr	√	√	√		
Cobalt ^(R) (S/P/B)	Co	√	√	√	√	
Copper (S/P) B*	Cu	√	√	√	√	√
Fluoride ^(R) (S/P)	F	√	√		√	
Gold (S/P)	Au	√	√	√	√	
Iodine (S/P/B)	I	√		√		√
Lead (B)	Pb	√		√		√
Lithium (S/P/B)	Li	√			√	
Manganese ^(R) (S)	Mn		√		√	
Manganese (B)	Mn	√		√		√
Mercury (B)	Hg	√		√		√
Metal screening (B)		√		√		
Molybdenum (S/P/B)	Mo	√		√	√	
Nickel ^(R) (S/P/B)	Ni	√	√	√	√	
Retinol binding protein (S/P)	RBP	√	√	√	√	√
Selenium (S/P/B)	Se	√	√	√	√	√
Silver (S/P/B)	Ag	√	√	√	√	
Tellurium (S/P/B)	Te	√	√	√	√	
Tin (S/P/B)	Sn	√	√	√	√	
Thallium (S/P/B)	Tl	√	√	√	√	
Uranium (S/P/B)	U	√	√	√	√	
Zinc ^(R) (S/P) B*	Zn	√	√		√	√
Zinc protoporphyrin (B)	ZPP	√		√		√
Zirconium (S/P/B)	Zr	√			√	

Notes: ^(R) Transfer pipettes must be pre-washed with nitric acid 0.5 % followed by distilled water: B* Screening only (S): Serum (P): Plasma (B): Blood

2.2 Post sampling instructions

Whole blood : Immediately invert the tubes 8 to 10 times to avoid clots.

2.3 Plasma/serum isolation from whole blood

If plasma or serum is requested for the tests (according to 2.1), follow these simple steps :

- Spin down the samples and transfer the plasma/serum to a plastic transfer tube.

When transferring, use a pre-rinsed transfer pipet (Nitric acid 0.5 % followed by distilled water).

3. Storage:

- Store at 4 °C prior to shipping for up to 1 week.
- Store at 4 °C for 2 days or otherwise at – 20 °C.

SAMPLING PROTOCOL FOR THE DETERMINATION OF ELEMENTS AND TRACE METALS IN URINE

1. Material:

- Polypropylene (Nalgene bottle 125 mL # 2104-0004)
- Cooler with "Ice-Pak[®]" for transportation.

2. Sampling:

2.1 β_2 -microglobulin

Void the bladder. Drink one full glass of water. Collect a urine specimen one hour later. Adjust pH between 6 and 8 with 1 M sodium hydroxide.

2.2 Element and trace metals

Collect a urine sample in a polypropylene (Nalgene bottle)

3. Storage:

3.1 β_2 -microglobulin

Store at 4 °C for 2 days or otherwise at – 20 °C.

3.2 Elements and trace metals

Store at 4 °C prior to shipping for up to 1 week.

SAMPLING PROTOCOL FOR THE DETERMINATION OF VITAMIN A AND VITAMIN E

1. Material:

- Blood collection tube (Heparin)
- Plastic tube Sarstedt # 60.542

2. Sampling:

It is important to separate plasma from the red blood cells as soon as possible.

Draw 5 mL of blood on heparin (other anticoagulants are not adequate). Centrifuge immediately and transfer the plasma into a plastic tube (Sarstedt # 60.542).

3. Storage:

Store frozen at –20 °C.