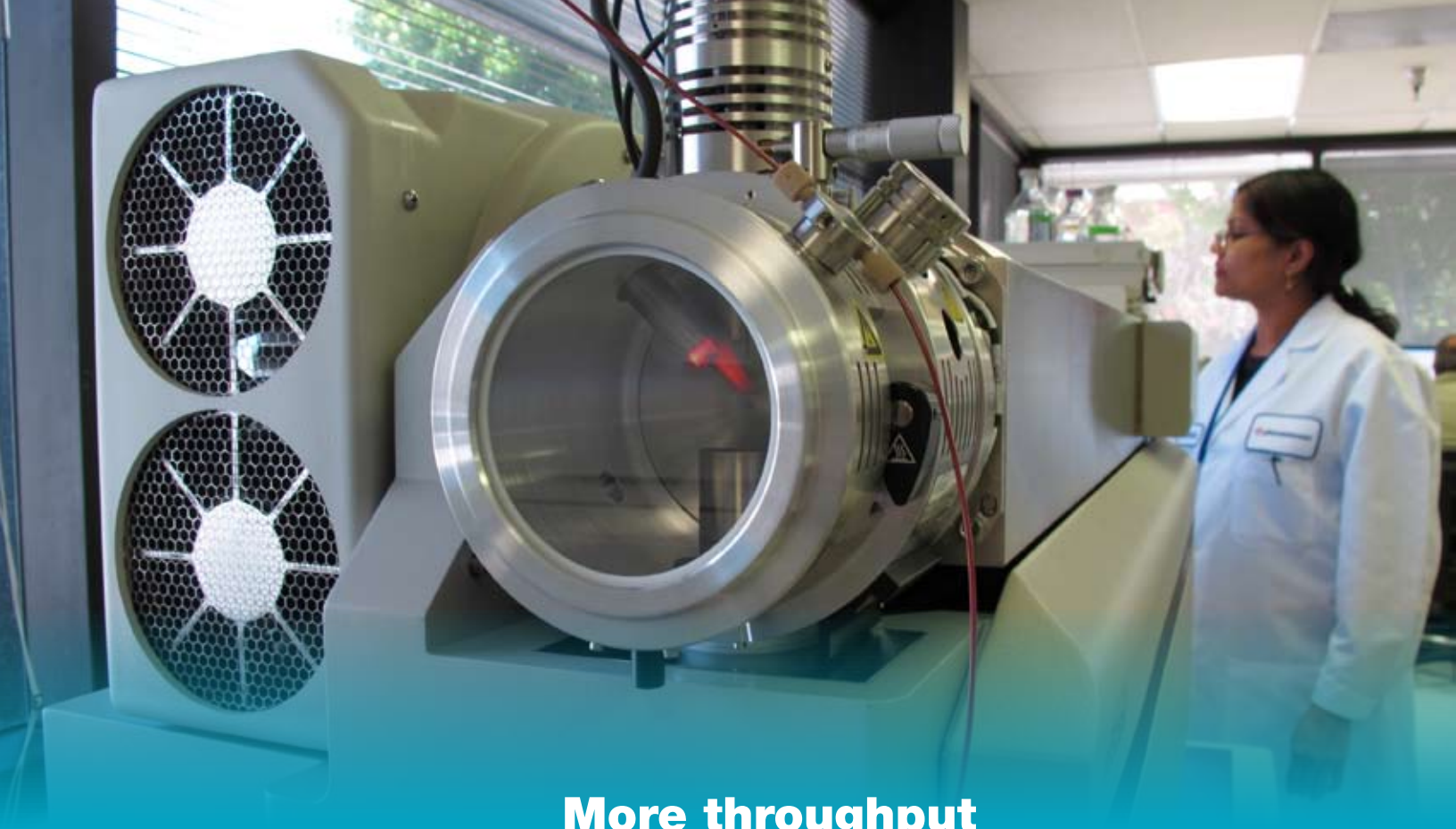
CLINICAL RESEARCH

APPLICATIONS GUIDE

phenomenex®
. . . breaking with tradition℠

US



More throughput

Greater sensitivity

Reduced costs

Less downtime

Your job has never demanded more from you. Doctors need accurate results yesterday. You need to minimize costs while increasing the number of samples run. New tests require months and months of design and validation.

Phenomenex is committed to providing complete solutions that meet your needs. From sample preparation, to chromatographic separation to detection, we are constantly working to achieve greater sensitivity, shorter run times and improved separations that that your lab can rely on.

Since 1982, Phenomenex has grown to become a leading provider of advanced technology solutions for separation science techniques in the areas of

- High-Performance Liquid Chromatography (HPLC/UHPLC)
- Gas Chromatography (GC)
- Sample Preparation

LC/MS and LC/MS/MS Applications

GC/MS Application

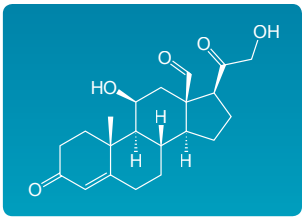
Solutions

PhenoLogix℠

This icon indicates an AB SCIEX™ iMethod™ Application featuring Phenomenex products is available for this analysis. iMethods are the easiest way to get started on an LC/MS/MS method if you are using Cliquid® Software. Contact Phenomenex or AB SCIEX for more details.

Aldosterone

Overproduction of Aldosterone in the body can lead to primary hyperaldostronism and hypertension. Clinical monitoring of Aldosterone in serum is one of the methods used to understand the cause of hypertension as well as to apply an effective and proper treatment.



Aldosterone

Method Highlights

- Excellent sensitivity down to 10 ng/dL

SAMPLE PREPARATION

Summary: Strata™-X-A 60 mg/3 mL cartridges were utilized to extract Aldosterone from serum samples.

Part No.: 8B-S123-UBJ

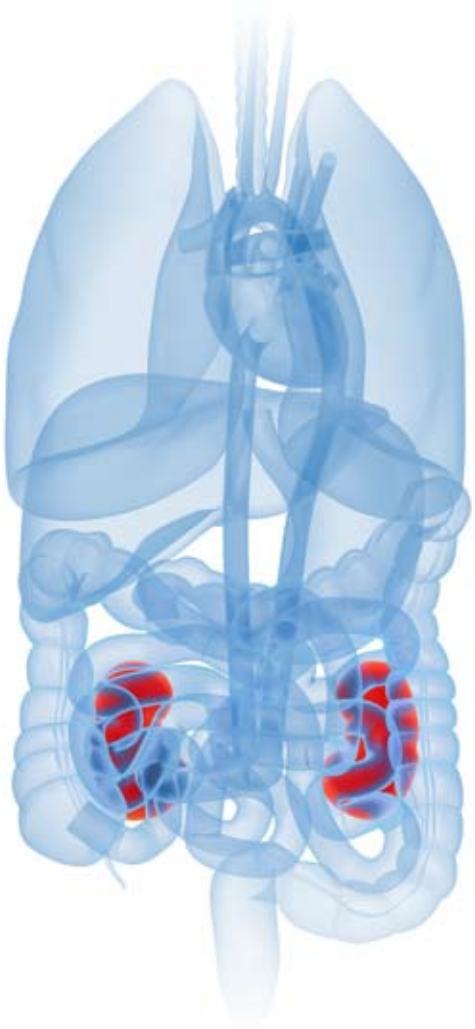

Also available in 96-well format

SAMPLE PRETREATMENT

1. Into individually labeled test tube combine 0.5 mL serum sample (or calibrator or QC sample),1 mL 25 mm ammonium bicarbonate (pH 8.9-9.0) and 0.1 mL working internal standard solution.
2. Proceed to SPE procedure

SPE PROCEDURE

1. Condition: 3 mL 100 % Methanol
2. Equilibrate: 3 mL 25 mM Ammonium bicarbonate
3. Load: Pretreated sample
4. Wash 1: 3 mL 25 mM Ammonium bicarbonate
5. Wash 2: 3 mL 25 % Methanol in Water
6. Dry: 5 min at high vacuum
7. Elute: 2 x 1 mL Ethyl Acetate/Isopropanol/NH_4OH (7:2:1)
8. Evaporate: to dryness @ 50-55 °C under a gentle nitrogen stream
9. Reconstitute: 100 µL of Methanol/Water (30:70) containing ~1 ppm Estriol

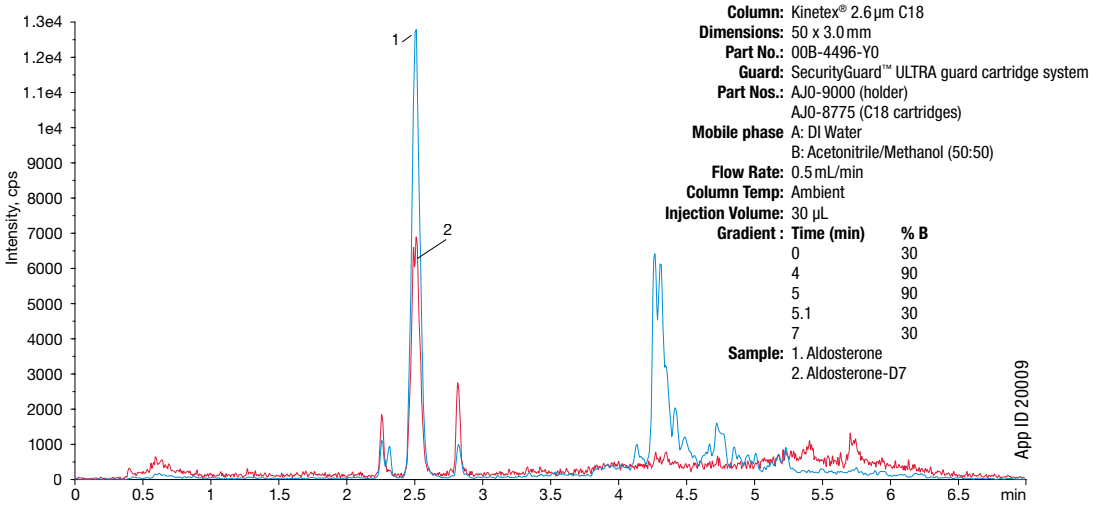


Aldosterone

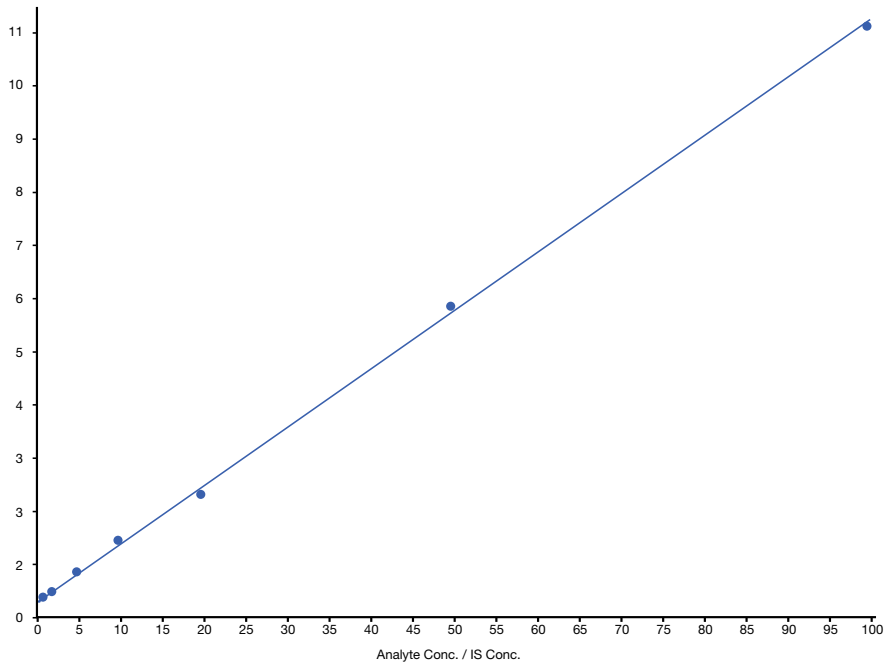
LC/MS/MS METHOD

Analyte	Q1	Q3
Aldo 1	359.1	189.0
Aldo 2	359.1	331.1
IS (Aldo-D7)	366.1	194.1

Chromatogram of an extracted serum standard.



A typical calibration range from 1-100 ng/dL. Corr Coeff = 0.9993



Tip
Transferable to a 2 mm ID column at 0.4 mL/min

Questions or Requests?
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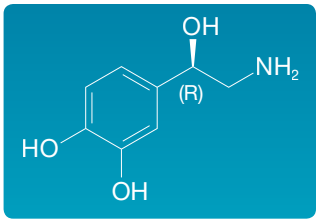
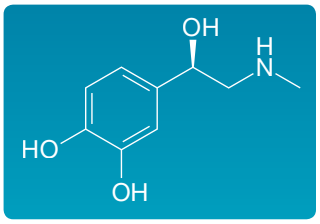
Catecholamines

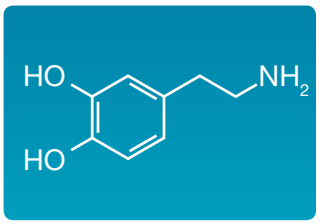
Catecholamines are hormones produced by the adrenal glands that are released into the blood during times of stress. Their measurements can aid in the diagnosis of tumors of the adrenal glands such as pheochromocytoma and the cause hypertension.



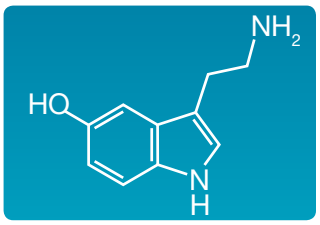
Norepinephrine



Epinephrine



Dopamine



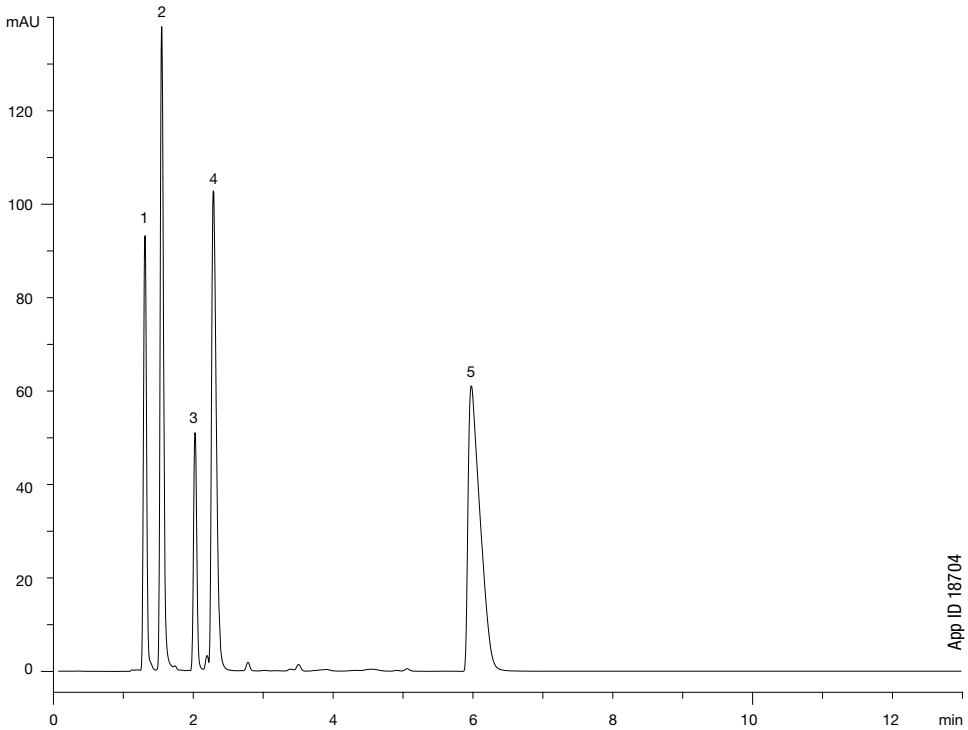
Serotonin

Method Highlights

- Fast run time and excellent separation with Kinetex® core-shell HPLC/UHPLC columns
- Extend column lifetime, minimizing down time and costs, with SecurityGuard™ ULTRA guard cartridge system

HPLC METHOD

Column: Kinetex 2.6 µm C18
Dimensions: 150 x 4.6 mm
Part No.: 00F-4462-E0
Guard: SecurityGuard ULTRA guard cartridge system
Part No.: AJ0-9000 (holder);
AJ0-8768 (C18 cartridges, 3/pk)
Mobile Phase: A: 5 mM Ammonium formate buffer, pH = 3 / Methanol (97:3)
Elution Type: Isocratic
Flow Rate: 1.2 mL/min
Detection: UV-Vis @ 280 nm
Temperature: Ambient
Sample: 1. Norepinephrine
2. Epinephrine
3. L-DOPA
4. Dopamine
5. Serotonin



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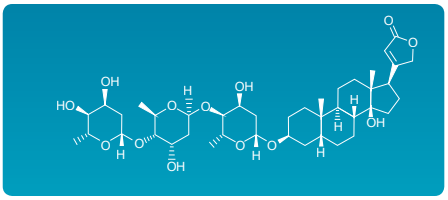
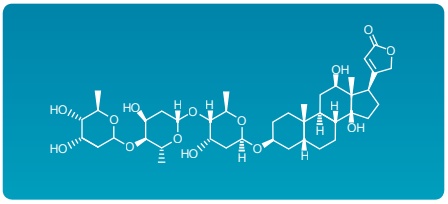
Digitoxin and Digoxin in Plasma

Digitoxin and Digoxin are the active compounds in some drugs used to treat cardiac failure. Both compounds have a narrow therapeutic index, making therapeutic monitoring essential to effective patient treatment.



Digitoxin



Digoxin

Method Highlights

- Excellent sample clean up with Strata™-X SPE
- Fast run time and excellent separation with Kinetex® core-shell HPLC/ UHPLC columns

SAMPLE PREPARATION

Summary: Strata-X 30 mg/3 mL cartridges were used to extract the analytes from plasma.

Part No.: 8B-S100-TBJ

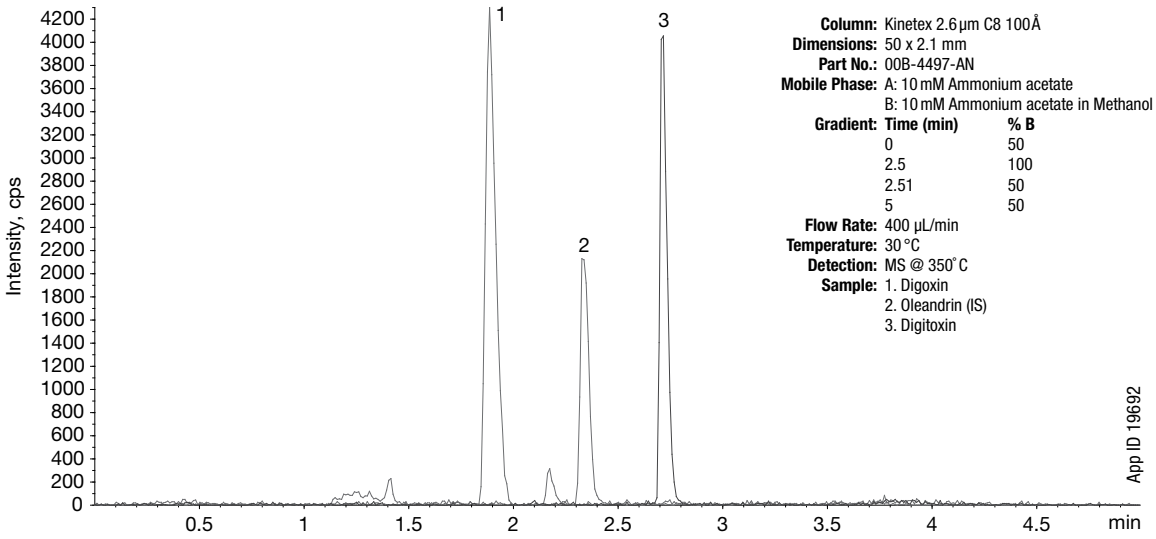
Analyte	Q1	Q3
Digoxin	798.4	651.4
Oleandrin (IS)	577.2	373.2
Digitoxin	782.4	635.4

SPE PROCEDURE

1. Condition: 2 mL Methanol @ 2 mL/min
2. Equilibrate: 2 mL 10 mM Ammonium acetate @ 2 mL/min
3. Load: sample
4. Wash: 1 mL 10 mM Ammonium acetate/10 mM Ammonium acetate (50:50) @ 2 mL/min
5. Dry: 10 minutes at full vacuum
6. Elute: 2 mL Methanol @ 1 mL/min

Also available in 96-well format

LC/MS/MS ANALYSIS



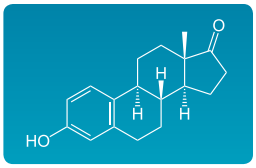
Column: Kinetex 2.6 µm C8 100 Å
Dimensions: 50 x 2.1 mm
Part No.: 00B-4497-AN
Mobile Phase: A: 10 mM Ammonium acetate
B: 10 mM Ammonium acetate in Methanol

Gradient:	**Time (min)**	**% B**
	0	50
	2.5	100
	2.51	50
	5	50

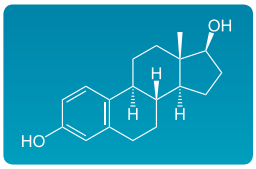
Flow Rate: 400 µL/min
Temperature: 30 °C
Detection: MS @ 350° C
Sample: 1. Digoxin
2. Oleandrin (IS)
3. Digitoxin

Estrogens

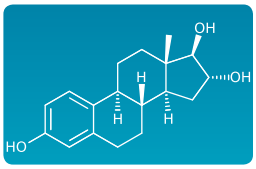
Estrogens are a group of steroids that are the primary female sex hormones. The three major estrogens in women are estrone (E1), estradiol (E2), and estriol (E3). Estrogen assays may be used to diagnose a wide variety of disorders and conditions.



Estrone



Estradiol



Estriol

Method Highlights

- 6-minute run time
- Method can be used for quantitation with a linear range from 5 to 500 pg/mL
- Long column lifetime under high pH conditions with Gemini® TWIN™ technology HPLC columns

LC/MS/MS ANALYSIS

Method 1: Estrone and Estradiol

Column: Gemini 3 µm C6-Phenyl
Dimensions: 50 x 2.0 mm
Part No.: 00B-4443-B0
Mobile Phase: A: Water + 0.01 % of 5.0 N Ammonium hydroxide
B: Methanol + 0.01 % of 5.0 N Ammonium hydroxide
Flow Rate: 0.55 mL/min
Gradient:

Time (min)	% B
0	10
0.5	10
2.5	80
5.0	90
5.2	10
6.0	10

Detector: API 5000™

Analyte	Q1	Q3
Estrone	269.13	145
Estradiol	271.12	145.1
d4-Estrone	273.1	147.2
d3-Estradiol	274.1	145.1

Method 2: Estriol

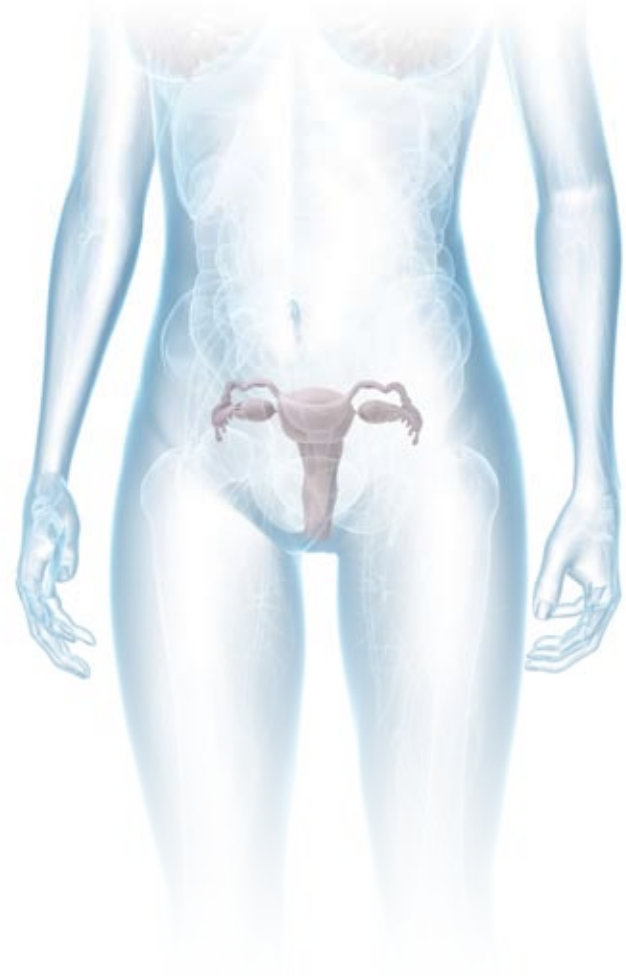
Column: Gemini 3 µm C6-Phenyl
Dimensions: 50 x 2.0 mm
Part No.: 00B-4443-B0
Mobile Phase: A: Water + 0.01 % of 5.0 N Ammonium hydroxide
B: Methanol + 0.01 % of 5.0 N Ammonium hydroxide
Flow Rate: 0.50 mL/min
Gradient:

Time (min)	% B
0	20
0.5	20
3.5	90
5.0	90
5.1	20
6.0	20

Analyte	Q1	Q3
Estriol	287.06	171.1
D3-Estriol	172.2	137.2

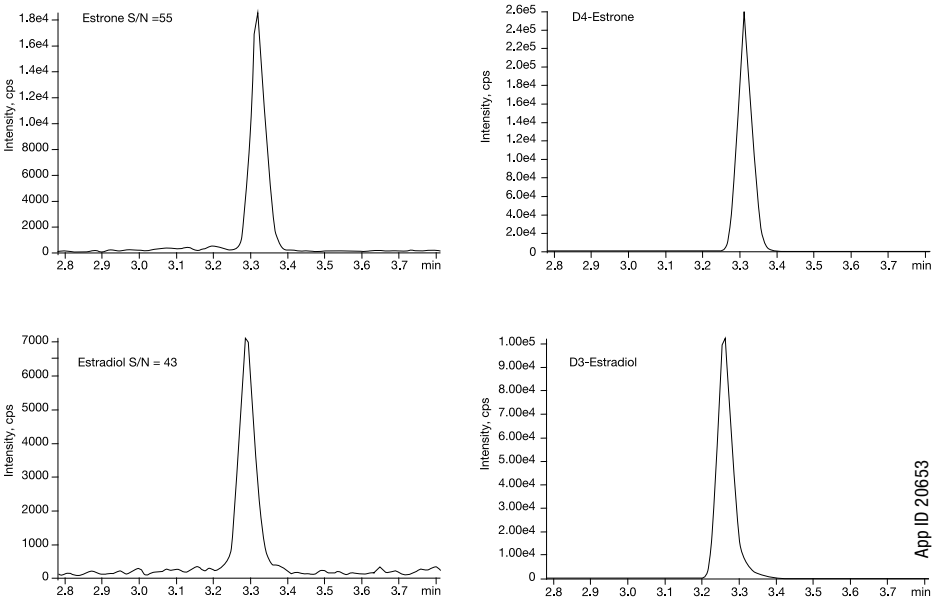
iMethod™ Available
Contact AB SCIEX or Phenomenex for details

AB SCIEX iMethod™ Test for Estrogens Version 1.0 for Cliquid® Software

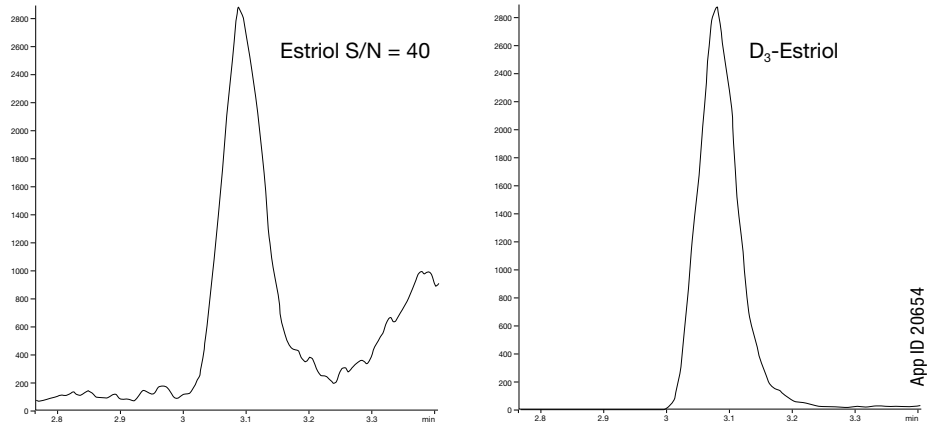


Estrogens

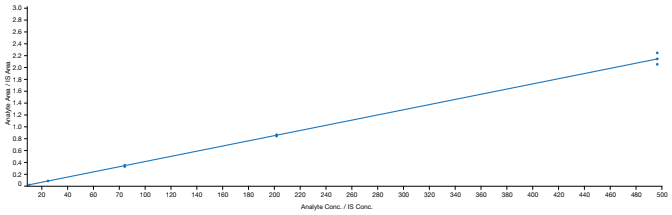
Method 1. Example chromatogram for 15 pg/mL of Estrone and Estradiol generated on an API 5000™ system in a six-minute run.



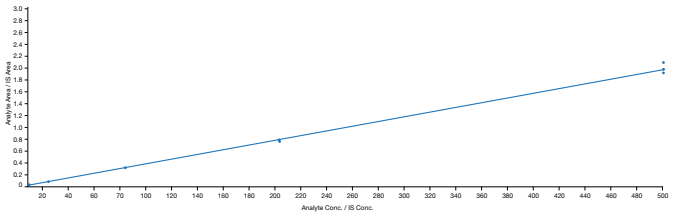
Method 2. Example chromatogram for 30 pg/mL of Estriol generated on an API 5000™ system in a six minute run.



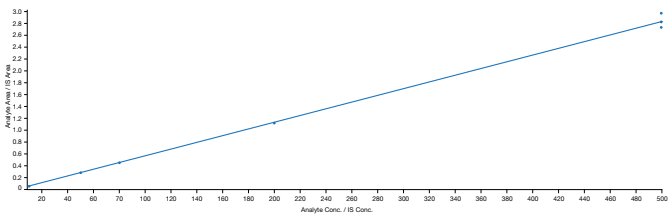
Representative calibration curve for Estrone. The assay was linear across the concentration range of 5-500 pg/mL.



Representative calibration curve for Estradiol. The assay was linear across the concentration range of 5-500 pg/mL.



Representative calibration curve for Estriol. The assay was linear across the concentration range of 10-500 pg/mL.



Questions or Requests?
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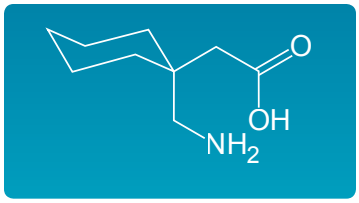
Gabapentin

Gabapentin is a pharmaceutical drug which has a wide range of uses including the treatment of neuropathic pain, seizures, menopause and treatment of methamphetamine, cocaine, and alcohol addiction.



Gabapentin

Method Highlights

- Fast run time with Kinetex® core-shell technology HPLC/UHPLC columns
- Excellent linearity from 0.5 µg/mL-25 µg/mL

SAMPLE PREPARATION

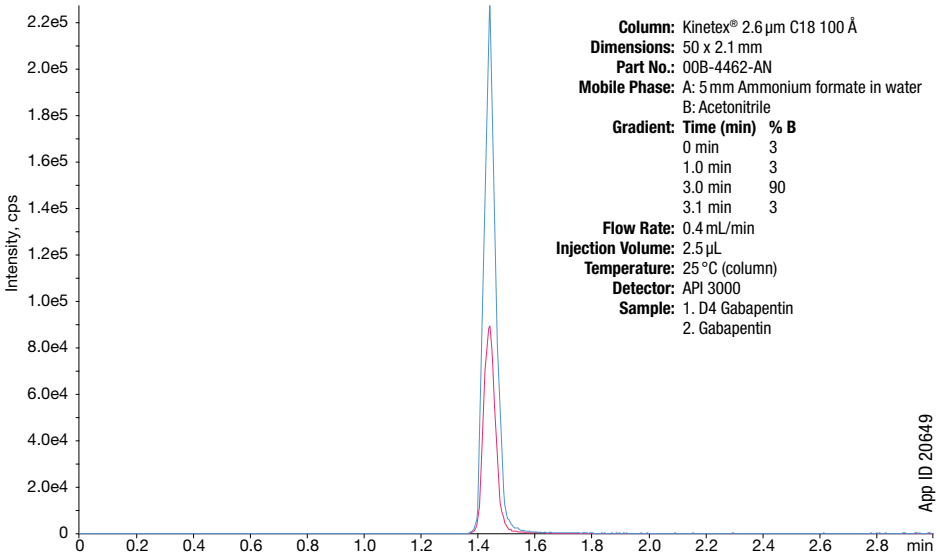
1. Transfer: 100 µL of plasma to a 0.5 mL centrifuge tube
2. Add: 100 µL of IS/10 %TCA solution to the centrifuge tube, mix briefly
3. Centrifuge: @ 14,000 rpm for 10 min
4. Transfer: 100 µL of the supernatant to an autosampler vial and QS to 1 mL with water. At this point the sample is ready for analysis.

Gabapentin

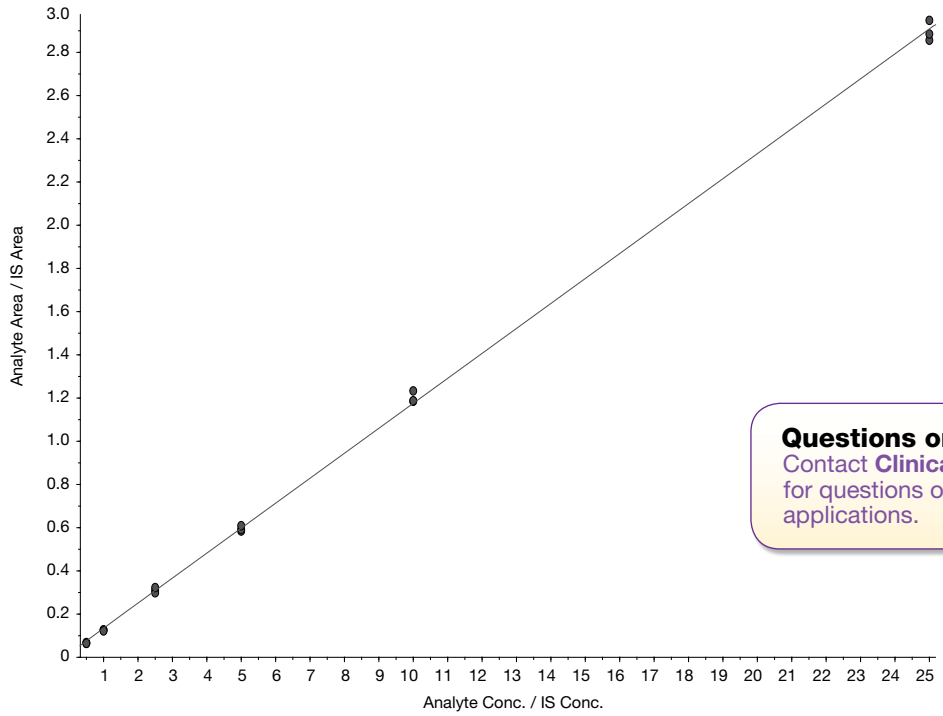
LC/MS/MS ANALYSIS

Analyte	Q1	Q3
Gabapentin 1	172.2	154.2
Gabapentin 2	172.2	137.2
D4-Gabapentin	176.2	158.2

Gabapentin extracted from plasma using protein precipitation with trichloroacetic acid at a concentration of 10 µg/mL.



Gabapentin calibration curve from 0.5 µg/mL-25 µg/mL extracted from plasma using protein precipitation with trichloroacetic acid.



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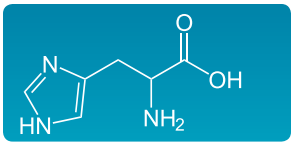
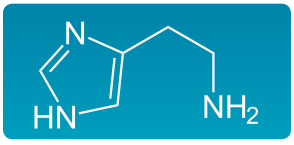
Histamine

Histamine is involved in immune responses and mediating many important physiological functions such as the regulation of the immune system, nervous system and the secretion of gastric acids. Histamine is formed by the decarboxylation of L-Histidine, an essential amino acid.



L-Histidine

Histadine decarboxylase



Histamine

Method Highlights

- Good retention and separation using Luna® HILIC HPLC columns
- Excellent sample clean up with Strata™-X-CW SPE

SAMPLE PREPARATION

Sample prep	Histamine was extracted from plasma using Strata-X-CW, 30 mg/3 mL cartridges
Part No.:	8B-S035-TBJ

SAMPLE PRETREATMENT

1. Add 1.1 mL IS solution containing 40 ng/mL histmine-d4 and I-methylhistamine-d3 prepared in DI water to 500 µL sample, blank, or plasma
2. Proceed to SPE procedure

SPE PROCEDURE

1. Condition: 1 mL 100 % Methanol
2. Equilibrate: 1 mL DI Water
3. Load: pretreated sample
4. Wash 1: 2 mL DI Water
5. Wash 2: 2 mL Methanol
6. Dry: 2 min at high vacuum level, ~20-30 in Hg
7. Elute: 2 x 250 µL portions of initial mobile phase composition containing B/A (87:13), fortified to contain 5 % Formic acid
8. Inject: 2 µL on column

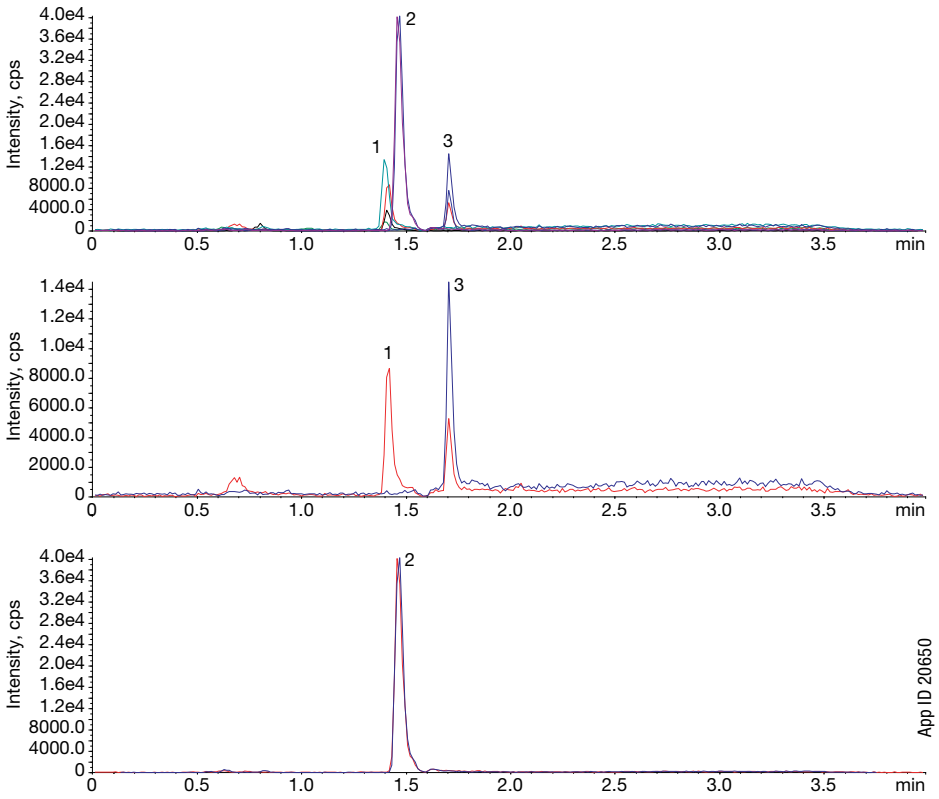
The sample flow through the SPE bed was kept at a rate of 1.5-2 mL/min during all stages of the extraction.

Also available in 96-well format

Histamine

LC/MS/MS ANALYSIS

Analyte	Q1	Q3
Histamine 1	112.1	95.0
Histamine 2	112.1	68.0
1-M-Histamine 1	126.1	109.0
1-M-Histamine 2	126.1	96.9
N-M-Histamine 1	126.1	95.0
N-M-Histamine 2	126.1	68.1
Histamine-D4	116.1	68.1
Methyl-Hist-D3	129.1	68.1



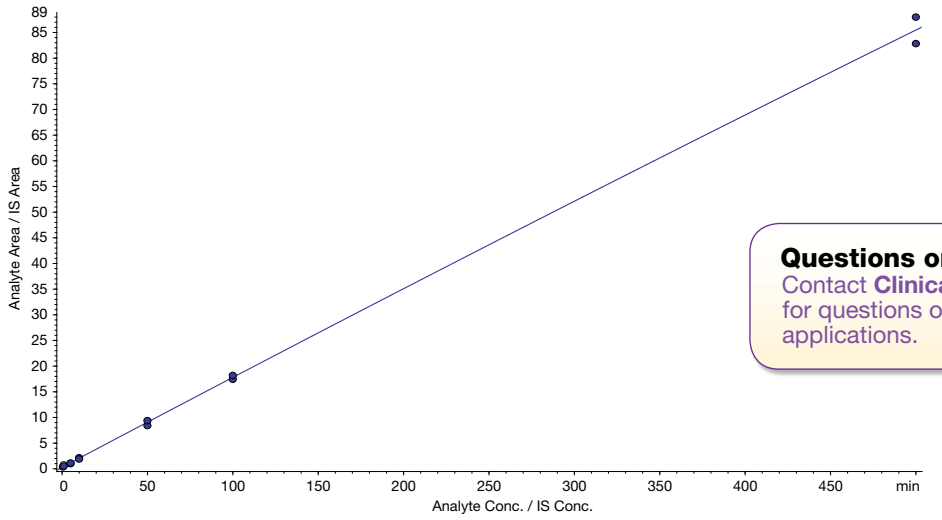
Column: Luna® HILIC 3 µm
Dimensions: 100 x 2.0 mm
Part No.: 00D-4449-B0
Mobile Phase: A: Acetonitrile/DI Water/100 mm Ammonium formate, pH 3.22 (50:45:5)
B: Acetonitrile:100 mm Ammonium formate, pH 3.22 (95:5)
Flow Rate: 0.6 mL/min
Column Temp: Ambient
Injection Volume.: 2 µL

Gradient:

Time (min)	% B
0	83
1.5	0
2.5	0
2.6	83
4.5	83

Sample: 1. 1-M-Histamine
2. N-M-Histamine
3. Histamine

Histamine calibration curve, Corr. Coeff.=0.9994



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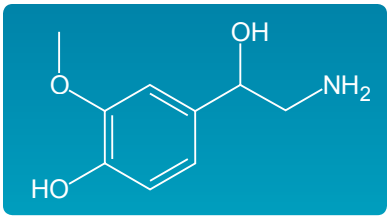
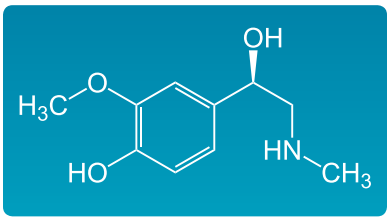
Metanephrine and Normetanephrine

Metanephrine and Normetanephrine are metabolites of epinephrine and norepinephrine. Their measurements are key in the diagnosis of tumors of the adrenal glands such as pheochromocytoma, which can be associated with hypertension.



Metanephrine



Normetanephrine

Method Highlights

- Samples were extracted from plasma to reduce interferences and suppression using Strata™-X-CW SPE.
- Luna® HILIC HPLC columns provide good retention for these polar compounds

SAMPLE PREPARATION

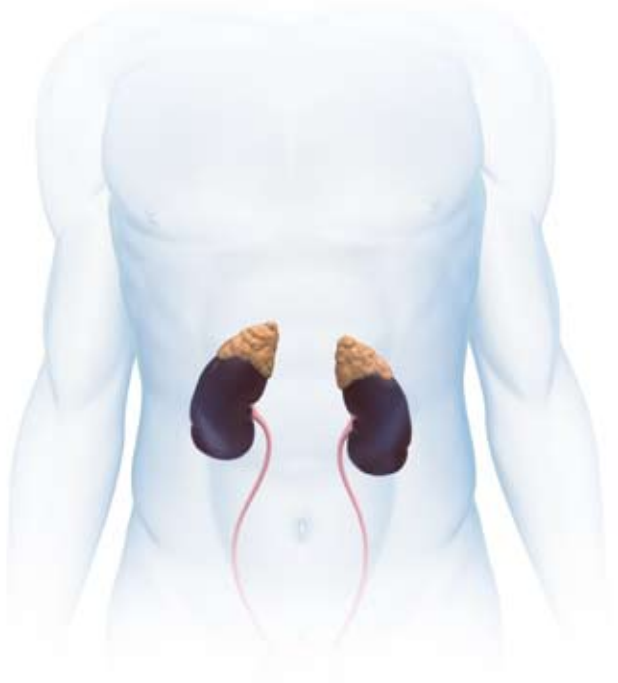
Sample Prep: Free Metanephrines (unconjugated) were extracted and concentrated from plasma using 30 mg Strata-X-CW weak cation-exchange polymeric resin in a 96-well plate

Part No.: 8E-S035-TGB

SPE PROCEDURE

1. Condition: 400 µL Methanol/Acetonitrile (50:50)
2. Equilibrate: 400 µL Water
3. Load: 500 µL plasma diluted with 1 mL Water
4. Wash: 800 µL Water followed by 2 mL Methanol/Acetonitrile (50:50)
5. Dry: 2 minutes at 10" Hg
6. Elute: 2x 200 µL of 5 % Formic acid (freshly prepared) in Acetonitrile/Methanol (50:50)
7. Dry down: to dryness under stream of nitrogen at 45 °C and reconstitute in 100 µL Acetonitrile/100 mM Ammonium formate, pH 3.2 (95:5)
8. Cap: reconstituted extract immediately to prevent evaporation


Also available in 96-well format



Metanephrine and Normetanephrine

LC/MS/MS METHOD

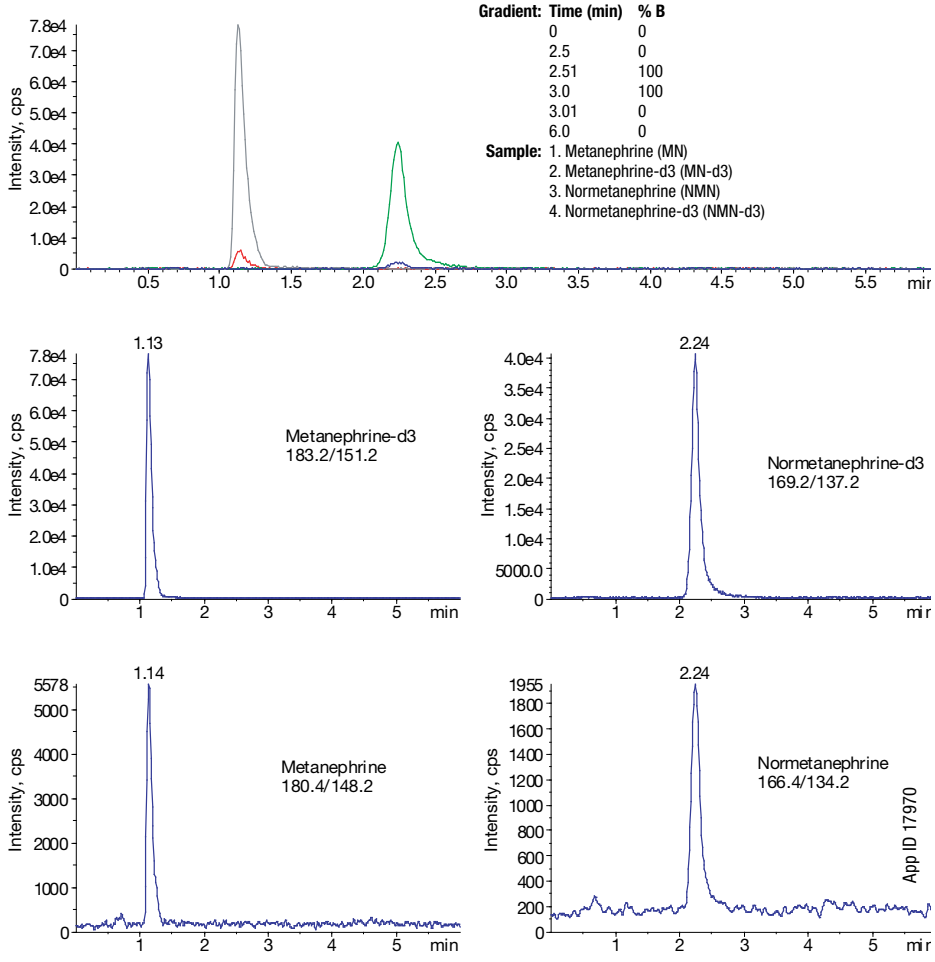
HILIC is generally performed using mobile phases containing high concentrations (>70 v/v %) of Acetonitrile, which are ideally suited for use with MS detection. Under HILIC conditions the more polar compounds elute later in the chromatographic run, which is exactly opposite to what is observed under reversed phase conditions.

Analyte	Q1	Q3
MN	180.4	148.2
MN-d3	183.4	151.2
NMN	166.4	134.2
NMN-d3	169.4	137.2

Column: Luna® 3 µm HILIC
Dimensions: 50 x 2.0 mm
Part No.: 00B-4449-B0
Mobile Phase: A: Acetonitrile/100 mM Ammonium formate, pH 3.2 (95:5)
B: Acetonitrile/Water/10 mm Ammonium formate, pH 3.2 (50:45:5)
Flow Rate: 0.4 mL/min
Injection vol: 30 µL of reconstituted extract
Gradient:

Time (min)	% B
0	0
2.5	0
2.51	100
3.0	100
3.01	0
6.0	0

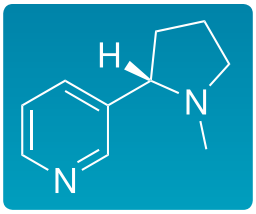
Sample: 1. Metanephrine (MN)
2. Metanephrine-d3 (MN-d3)
3. Normetanephrine (NMN)
4. Normetanephrine-d3 (NMN-d3)



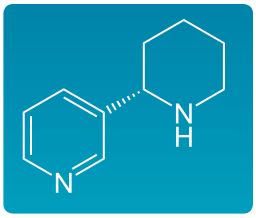
Questions or Requests?
Contact **ClinicalResearch@phenomenex.com** for questions on applications or to request additional applications.

Nicotine and its Metabolites

Nicotine is the most abundant alkaloid present in all tobacco products. Determination of nicotine metabolism / pharmacokinetics provides a useful tool for estimating uptake of nicotine and tobacco-related toxicants, for understanding the pharmacologic effects of nicotine and nicotine addiction, and for optimizing nicotine dependency treatment. Tobacco products also contain other alkaloids that can serve as unique markers of tobacco use. Two examples are anabasine and nornicotine, which are present in tobacco products, but not in nicotine replacement therapies.



Nicotine



Anabasine

Method Highlights

- Fast run time (<6 minutes)
- Resolution of alkaloids that can confirm tobacco use

SAMPLE PREPARATION

Summary: The samples were extracted using Strata™-X-C 60 mg/3 mL tubes

Part No.: 8B-S029-UBJ

1. Dilute 0.5 mL urine with 0.5 mL of 20 mM Ammonium acetate, pH 4.
2. Add 100 µL internal standard
3. Proceed to SPE procedure

Also available in 96-well format

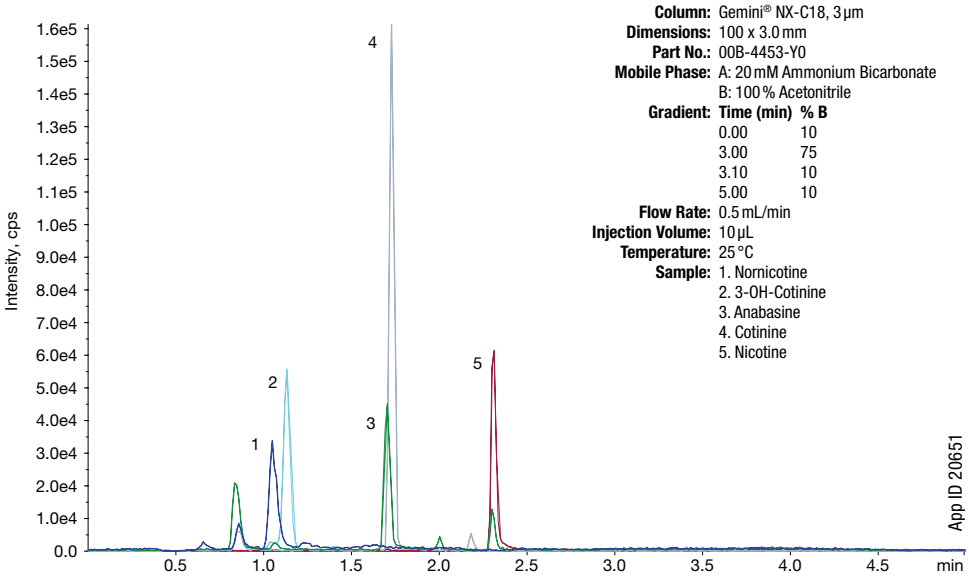
SPE PROCEDURE

1. Condition: 2 mL Methanol (1-2 mL/min)
2. Equilibrate: 2 mL Ammonium acetate buffer
3. Load: 0.5 mL diluted urine sample
4. Wash 1: 2 mL Ammonium acetate buffer
5. Wash 2: 2 mL 30 % Methanol
6. Dry: > 10" Hg for 5 min to remove residual water
7. Elute: 2 x 2.0 mL 1.5 % Ammonium hydroxide/Methanol solution
8. Dry down: Nitrogen gas at 55 °C
9. Reconstitute: 500 µL of Acetonitrile/20 mM Ammonium bicarbonate (10:90)

Request our new nicotine tech note!

Nicotine and its Metabolites

LC/MS/MS METHOD



Column: Gemini® NX-C18, 3 µm
Dimensions: 100 x 3.0 mm
Part No.: 00B-4453-Y0
Mobile Phase: A: 20 mM Ammonium Bicarbonate
B: 100 % Acetonitrile
Gradient:

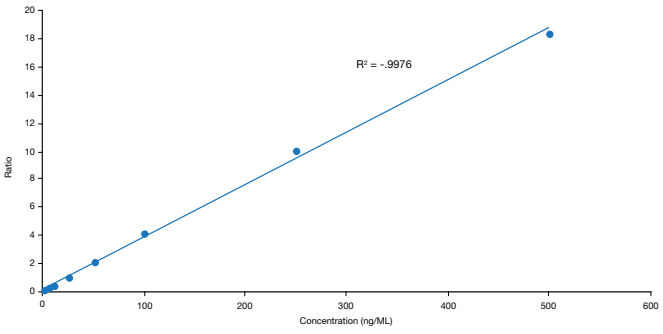
Time (min)	% B
0.00	10
3.00	75
3.10	10
5.00	10

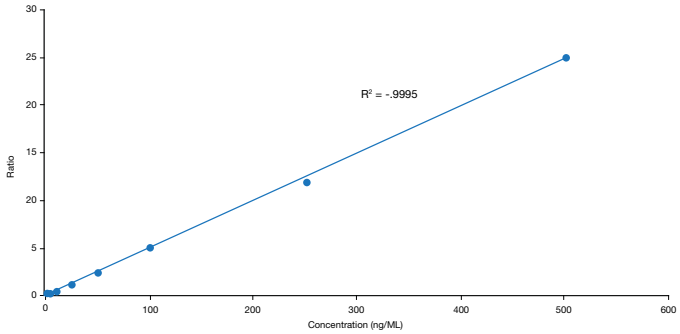
Flow Rate: 0.5 mL/min
Injection Volume: 10 µL
Temperature: 25 °C
Sample: 1. Nornicotine
2. 3-OH-Cotinine
3. Anabasine
4. Cotinine
5. Nicotine

Nicotine, Cotinine, 3-Hydroxycotinine, Nornicotine and Anabasine analysis (10 ng/mL urine extracted standard)

Analyte	Q1	Q3
Nicotine	163.1	132.1
Nicotine-d4	167.1	136.0
Cotinine	177.1	80.1
Cotinine-d3	180.1	80.1
Nornicotine	149.1	80.1
Nornicotine-d4	153.1	84.1
3-OH-Cotinine	193.1	80.1
3-OH-Cotinine-d3	196.1	80.1
Anabasine	163.1	120.1

Standard curves from 1 ng/mL to 500 ng/mL for Nicotine, Cotinine, Nornicotine, 3-Hydroxycotinine and Anabasine





Questions or Requests?
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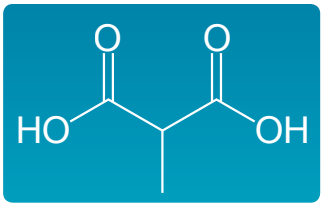
Methylmalonic Acid (MMA)

Methylmalonic Acid (MMA) levels are tested to diagnose and monitor Vitamin B12 deficiency, which is often related to the metabolic disorder methylmalonic acidemia.



Methylmalonic Acid

Method Highlights

- 2 minute run time and excellent peak shape using Gemini® HPLC columns

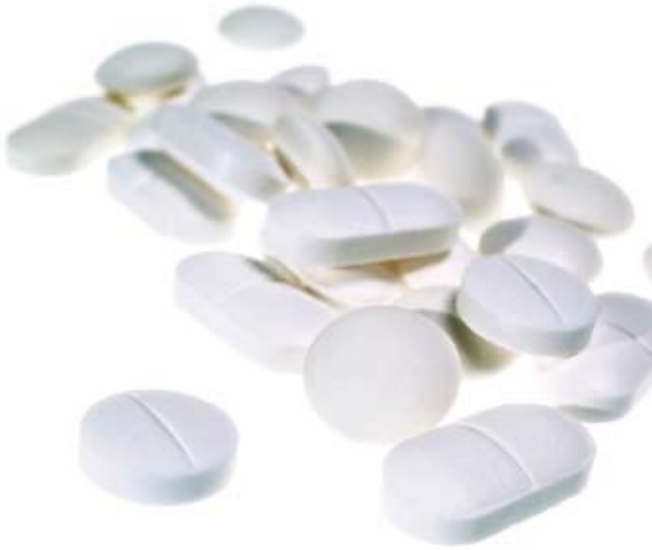
SAMPLE PREPARATION

Summary: The samples can be extracted from urine or serum using Strata™-X-AW 30 mg/1 mL

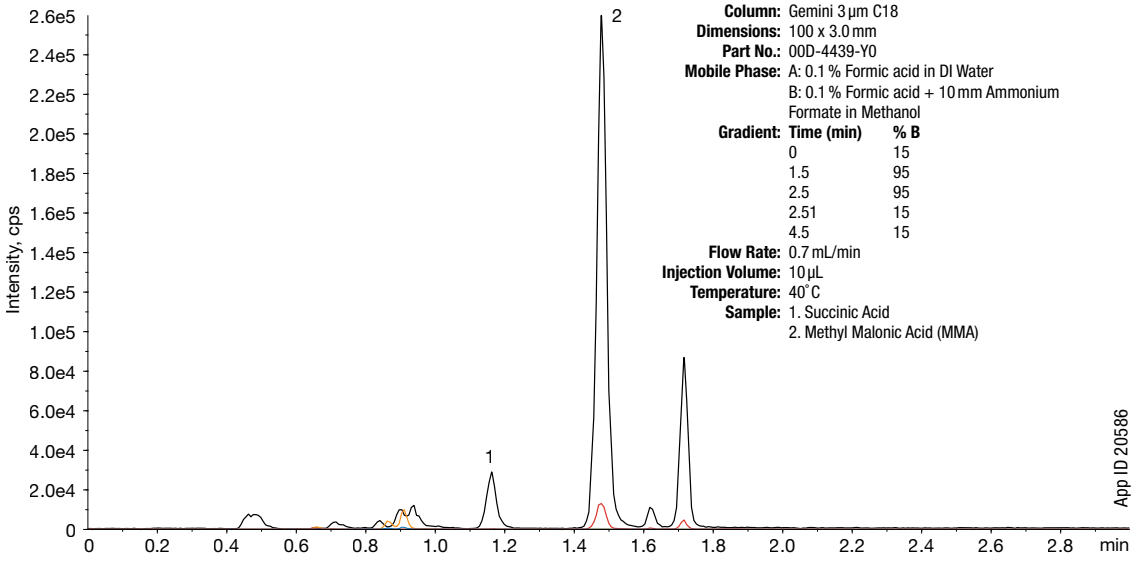
Part No.: 8B-S038-TAK

SPE PROCEDURE

1. Into individually labeled 1.5 mL conical micro-centrifuge tubes combine 0.5 mL 25 mM Ammonium formate, 50 µL IS and 100 µL blank, standard, or sample
2. Activate the SPE cartridge with 1 mL 100 % Methanol
3. Equilibrate the SPE cartridge with 1 mL 25 mM Ammonium formate
4. Load sample and proceed with elution
5. Wash the SPE cartridge with 0.5 mL 50 % Methanol
6. Dry the SPE bed under high vacuum for 5-10 min
7. Elute the analyte with 2 x 0.600 mL 2 % NH_4OH in Methanol
8. Evaporate the tubes in a concentrator at 45-50 °C
9. Remove the tubes and resuspend the residue in 200 µL 0.1 % Formic acid
10. Inject 10 µL on column



LC/MS/MS METHOD



Column: Gemini 3 µm C18
Dimensions: 100 x 3.0 mm
Part No.: 00D-4439-Y0
Mobile Phase: A: 0.1 % Formic acid in DI Water
B: 0.1 % Formic acid + 10 mm Ammonium Formate in Methanol

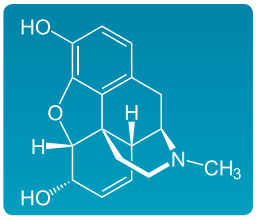
Gradient:

Time (min)	% B
0	15
1.5	95
2.5	95
2.51	15
4.5	15

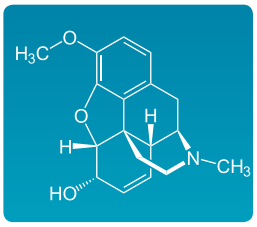
Flow Rate: 0.7 mL/min
Injection Volume: 10 µL
Temperature: 40°C
Sample: 1. Succinic Acid
2. Methyl Malonic Acid (MMA)

Pain Control and Illicit Drug Panel

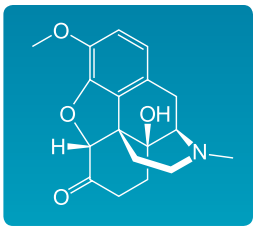
Pain management drugs are among the most abused drugs today. LC/MS/MS is a key technique for determining which drugs are being abused, whether through illicit or prescribed use.



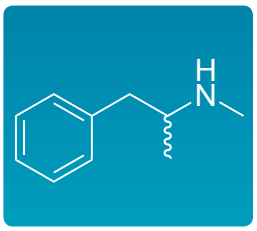
Morphine



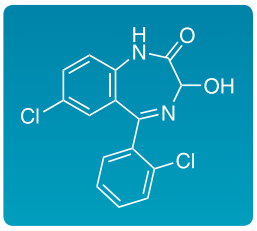
Codeine



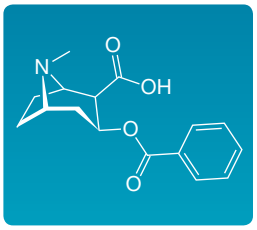
Oxycodone



Methamphetamine



Lorezepam



Benzoylecgonine

Method Highlights

- Excellent separation of isobaric compounds
- Choose from 2 HPLC/UHPLC stationary phases (C18 and PFP) to optimize separations for your sample

SPE PROCEDURE:

Summary: Strata™-X-Drug B 33 µm Polymeric Strong Cation, 60 mg / 6 mL, Tube, 30/pk

Part No.: 8B-S128-UCH

The solvent volumes shown below are for a 60 mg bed mass. The solvent volumes will need to be adjusted for a smaller or larger bed mass.

1. Conditioning: No conditioning required.
2. Load: To 2mL urine sample, add 500 µL of conc. HCl.
   i. Heat at 90 °C for 2 hours.
   ii. Add 2 mL of 200 mM Sodium Acetate Buffer (pH 4.0).
   iii. Add 1 mL of 6 N KOH. Vortex.
   iv. Centrifuge for 5 mins at 5000 rpm.
   v. Verify pH of sample is between 4.0-6.0.
   vi. Load pre-treated sample directly onto SPE cartridge.
3. Wash: 2 mL of 100 mM Sodium acetate (pH 5.0) buffer
   i. 2 mL of Methanol
   ii. 2 mL of Ethyl acetate:Isopropanol:NH_4OH (7:2:1)
4. Evaporate: to dryness under a stream of nitrogen at 50 °C.
5. Reconstitute: 1 mL of 15 % methanol.
6. Inject: 5 µL on HPLC / Mass Spectrometer (MS).

For serum/plasma samples:

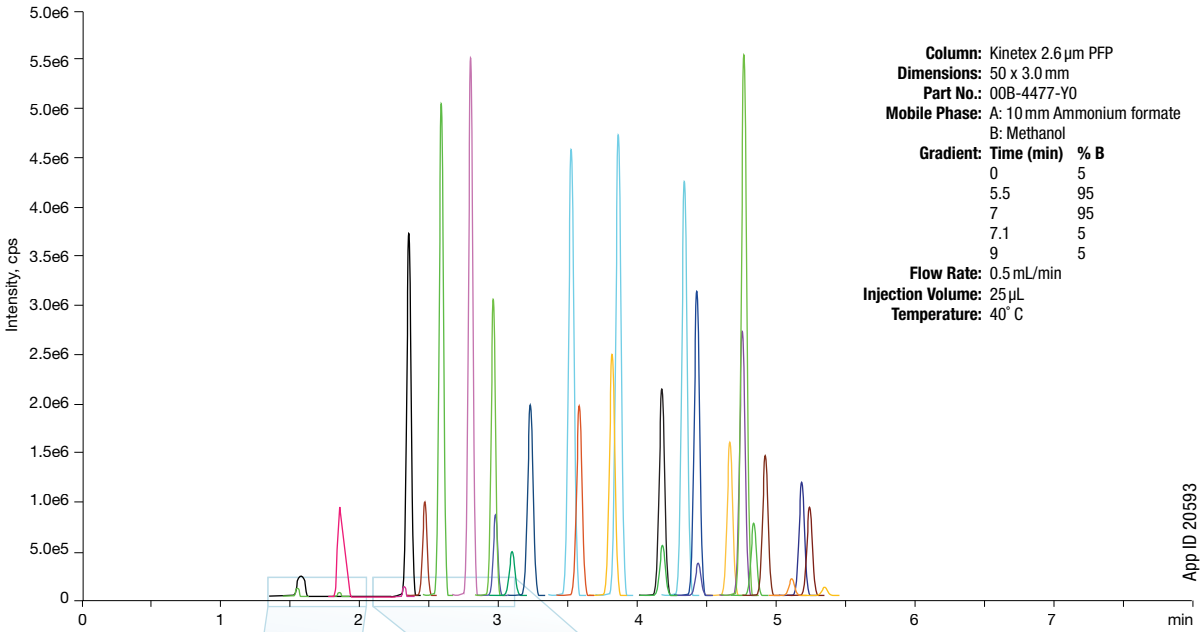
1. Pre-treatment: Dilute plasma sample 3:1 with 1 % acetic acid. Vortex. Centrifuge for 5 minutes at 3000 g. Load directly onto Strata-X-Drug B sorbent. No conditioning required.

For saliva samples:

1. Pre-treatment: Dilute saliva sample 3:1 with 1% acetic acid. Vortex. Centrifuge for 5 minutes at 3000 g. Load directly onto Strata-X-Drug B sorbent. No conditioning required.

Pain Control and Illicit Drug Panel

Kinetex® 2.6 µm PFP, 50 x 3.0 mm

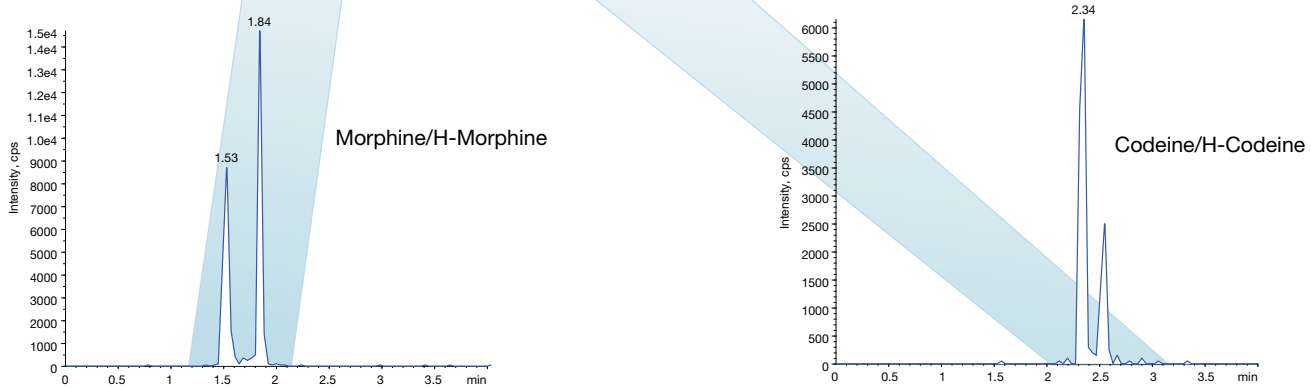


Column: Kinetex 2.6 µm PFP
Dimensions: 50 x 3.0 mm
Part No.: 00B-4477-Y0
Mobile Phase: A: 10 mm Ammonium formate
B: Methanol

Gradient:	Time (min)	% B
	0	5
	5.5	95
	7	95
	7.1	5
	9	5

Flow Rate: 0.5 mL/min
Injection Volume: 25 µL
Temperature: 40° C

Resolution of Critical Isobars



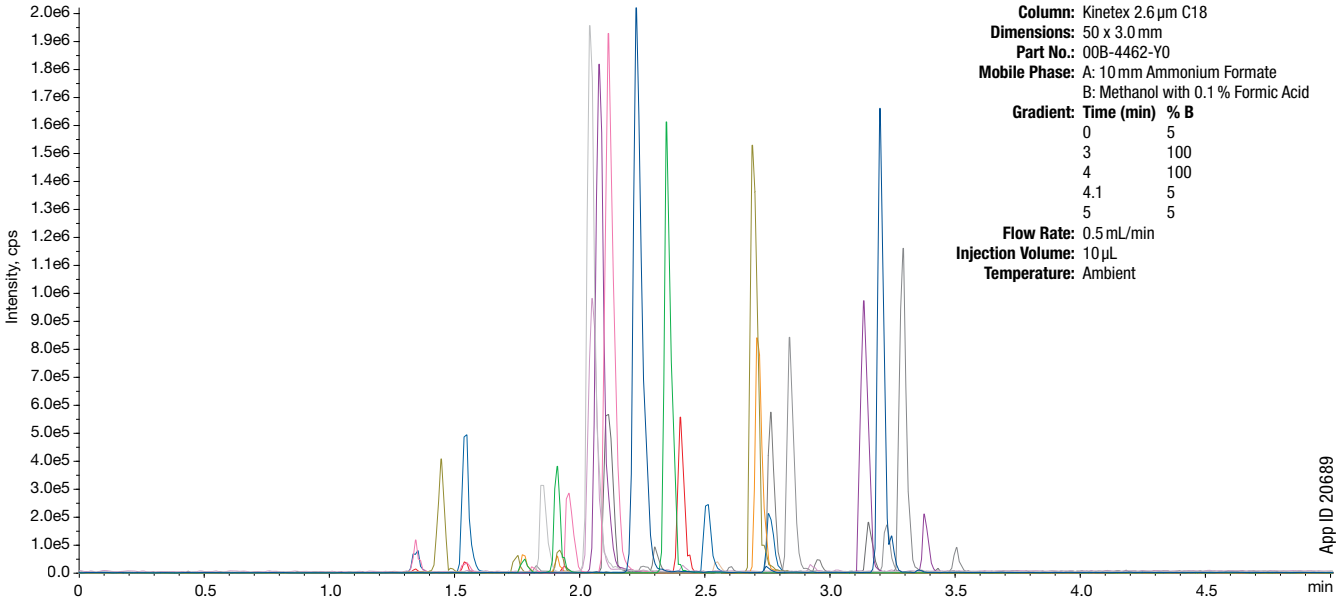
ID	Q1	Q3
Morphine	286.2	152
Oxymorphone	302.1	227
Hydromorphone	286.2	185
Codeine	300.1	152.1
Oxycodone	316.2	241
Amphetamine	136.1	91
Naltrexone	342.2	267.1
6-MAM	328.1	165.2
Hydrocodone	300.1	199.1
Methamphetamine	150.1	91.2
MDA 2	180.1	133
Benzoylecgonine	290.2	168.1
Naloxone	328.1	212
MDMA	194.1	163.2

ID	Q1	Q3
MDEA	208.2	163.2
Norfentanyl	233.2	84.1
Meprobamate	219.2	158.2
Tramadol	264.2	58.1
Normeperidine	234.1	160.2
Meperidine	248.2	220
PCP	244.3	91
Norbuprenorphine	414.3	101.1
EDDP	278.3	234.2
Fentanyl	337.2	105.1
Flurazepam	388.2	315.1
Norpropoxyphene	308.2	100.1
Clonazepam	316	270.1
Flunitrazepam	314.1	268.2

ID	Q1	Q3
α-hydroxyalprazolam	325.1	297
Propoxyphene	340.2	266.3
Methadone	310.2	265.2
Sufentanil	387.2	238.2
Carisoprodol	261.2	176.2
Oxazepam	287.1	241
Lorazepam	321	275.1
Alprazolam	309.1	281
Temazepam	301.1	255.1
Nordiazepam	271.1	140
Midazolam	326.1	291.1
Buprenorphine	468.3	396.1
Diazepam	285.1	193.1

Pain Control and Illicit Drug Panel

Kinetex® C18 2.6 µm, 50 x 3.0 mm



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Methamphetamine	150.1	91.2
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MDA	180.1	133
MDMA	194.1	163.2
Codeine	300.1	152.1
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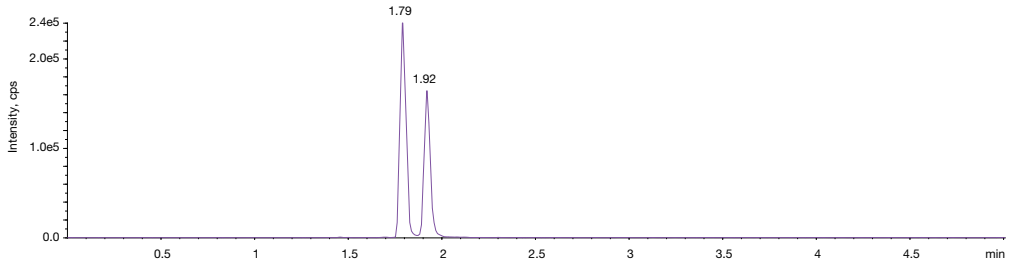
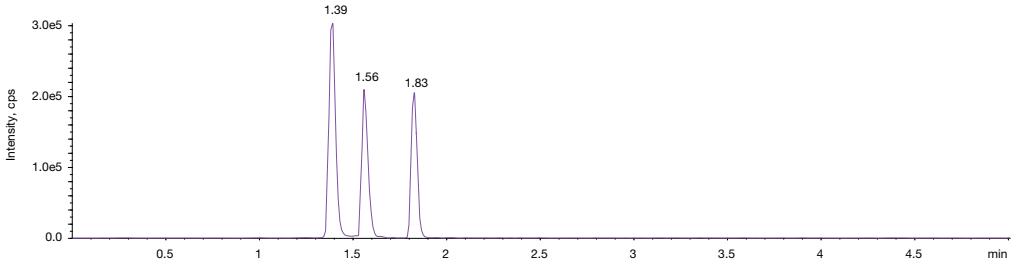
6-MAM	328.1	165.2
Hydrocodone	300.1	199.1
Benzoylecgonine	290.2	168.1
Norfentanyl	233.2	84.1
Tramadol	264.2	58.1
Naloxone	328.1	212
Normeperidine	234.1	160.2
Meperidine	248.2	220
Meprobamate	219.2	158.2
PCP	244.3	91
Norbuprenorphine	414.3	101.1
EDDP	278.3	234.2
Norpropoxyphene	308.2	100.1
Clonazepam	316	270.1
Flunitrazepam	314.1	268.2
α-hydroxyalprazolam	325.1	297
Carisoprodol	261.2	176.2
Oxazepam	287.1	241
Methadone	310.2	265.2
Lorazepam	321	275.1
Fentanyl	337.2	105.1
Flurazepam	388.2	315.1
Alprazolam	309.1	281
Temazepam	301.1	255.1
Propoxyphene	340.2	266.3
Nordiazepam	271.1	140
Diazepam	285.1	193.1
Midazolam	326.1	291.1
Sufentanil	387.2	238.2
Buprenorphine	468.3	396.1

Resolution of Critical Isobars

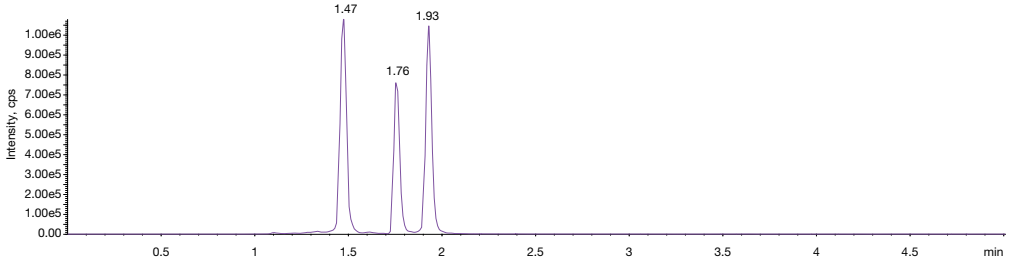
Codeine/Hydrocodone



Morphine/Hydromorphone/Norhydrocodone

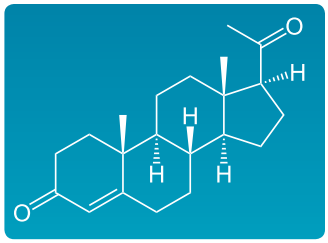


Oxymorphone/Dihydrocodeine/Noroxycodone



17-OH-Progesterone

Measurements of levels of 17-hydroxyprogesterone are useful in the evaluation of patients with suspected congenital adrenal hyperplasia (CAH). CAH leads to excess production of androgen, resulting in male characteristics to appear earlier than normal in men or more prominently than usual in females.



17-OH-Progesterone

Method Highlights

- Excellent peak shape and linearity using Gemini® NX-C18 HPLC columns

SAMPLE PREPARATION

Summary: Strata™-X-A 30 mg/3 mL SPE tubes were used to extract the samples from human serum

Part No.: 8B-S123-TBJ

SAMPLE PRETREATMENT

1. Dilute 0.25 mL of sample with 1 mL DI Water and 0.1 mL IS solution (1 ng/mL Testo-D3 and 3 ng/mL 17-OH-Prog-D8 in Methanol/DI Water (50:50))
2. Proceed to SPE procedure

SPE PROCEDURE

1. Condition: 1 mL 100 % Methanol
2. Equilibrate: 1 mL DI Water
3. Load: pretreated sample
4. Wash: 0.6 mL 50 % Methanol
5. Dry: under high vacuum for 2-3 min
6. Elute: 2 x 0.6 mL 100 % Methanol
7. Evaporate: to dryness at 50-55 °C under gentle nitrogen stream
8. Reconstitute: 250 µL 20 % Acetonitrile in 0.1 % Formic acid

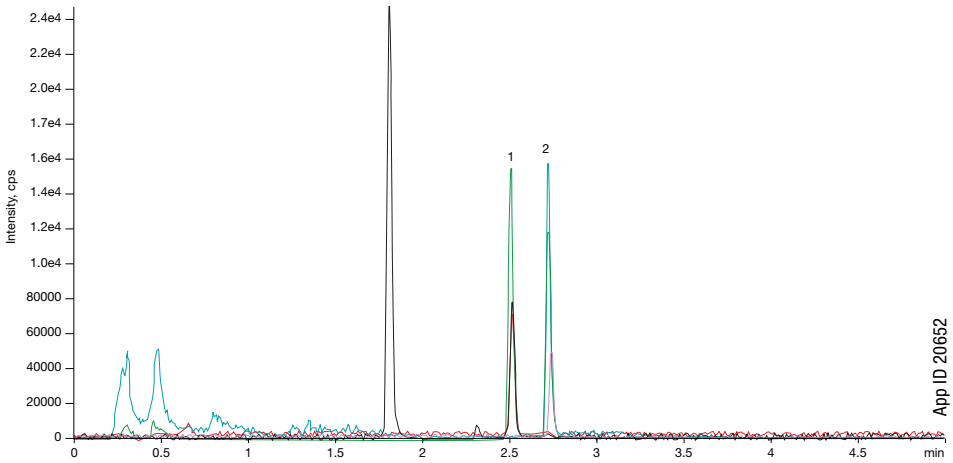
Also available in 96-well format

17-OH-Progesterone

LC/MS/MS ANALYSIS

Analyte	Q1	Q3
17-OH-Progesterone	331.3	97.2 (17-OH-1)
	331.3	109.2 (17-OHP-2)
17-OH-Progesterone-D8	339.3	100.1
	339.3	113.2

0.250 µg/L standard

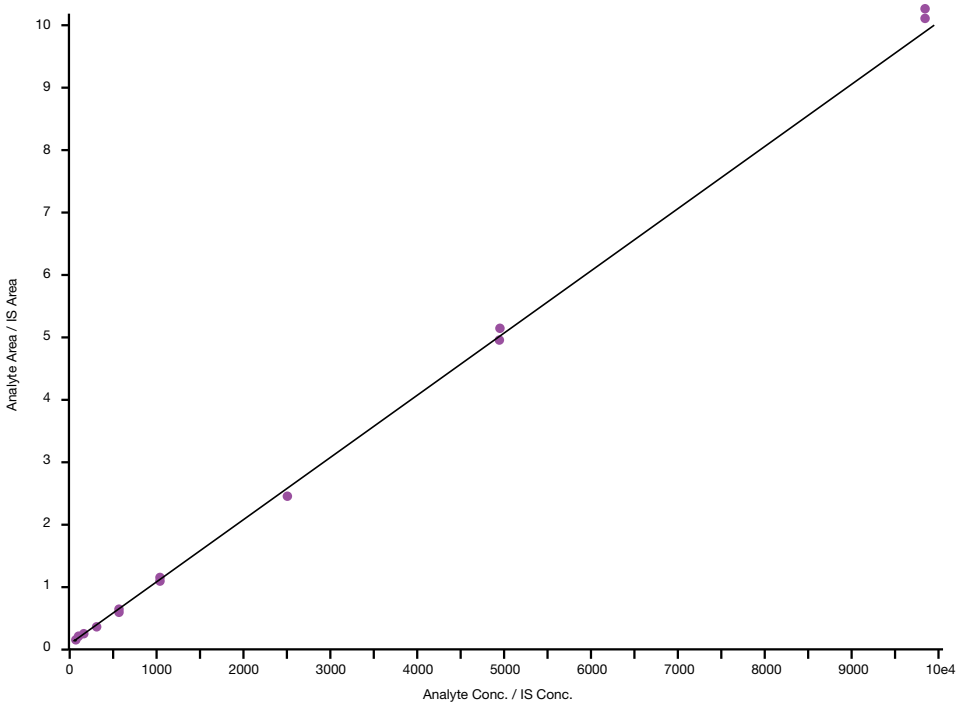


Column: Gemini® NX-C18 3 µm
Dimensions: 50 x 2.0 mm
Part No.: 00B-4453-B0
Mobile Phase: A: 0.1 % Formic acid in DI Water
B: 0.1 % Formic acid in Acetonitrile
Flow Rate: 0.4 mL/min
Column Temp: Ambient
Injection Volume: 25 µL

Gradient:	**Time (min)**	**% B**
	0.0	20
	2.5	75
	4.5	75
	4.6	20
	6.0	20

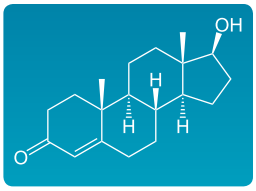
Sample: 1. Testosterone
2. 17-OH-Progesterone

Calibration Data 17-OH-Progesterone

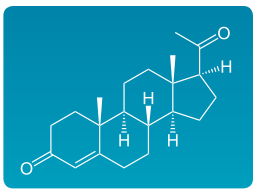


Steroids Panel

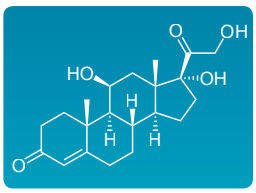
Corticosteroids are an important class of compounds that have uses as therapeutic agents as well as illicit uses. Steroid hormones are widely used throughout the body and are involved in numerous regulatory pathways including immune response, sexual differentiation, and metabolic function.



Testosterone



Progesterone



Cortisol

Method Highlights

- Separate 11 steroids from serum in one run on Kinetex® HPLC/UHPLC C18 columns
- Quick sample preparation using protein precipitation

SAMPLE PREPARATION

Summary: The analytes were extracted from 200 µL of human serum by protein precipitation, diluted, and injected.

Part No.: CE0-7565

For protein precipitatin method details, go to www.phenomenex.com/impact

Analyte	Q1	Q3	Q3
DHEAS	271.1	213.1	253.2
Cortisol	363.1	115.1	121.0
11-Deoxycortisol	347.1	97.0	109.0
Androstenedione	287.1	109.0	97.1
Estradiol (water loss)	255.1	144.0	159.1
Testosterone	289.	109.0	97.0
17-OH-Progesterone	331.0	97.0	109.0
DHEA	271.2	213.1	253.2
Progesterone	315.1	109.0	97.0
25-Hydroxyvitamin D3	383.3	91.0	365.3
Corticosterone	347.1	121.1	91.0

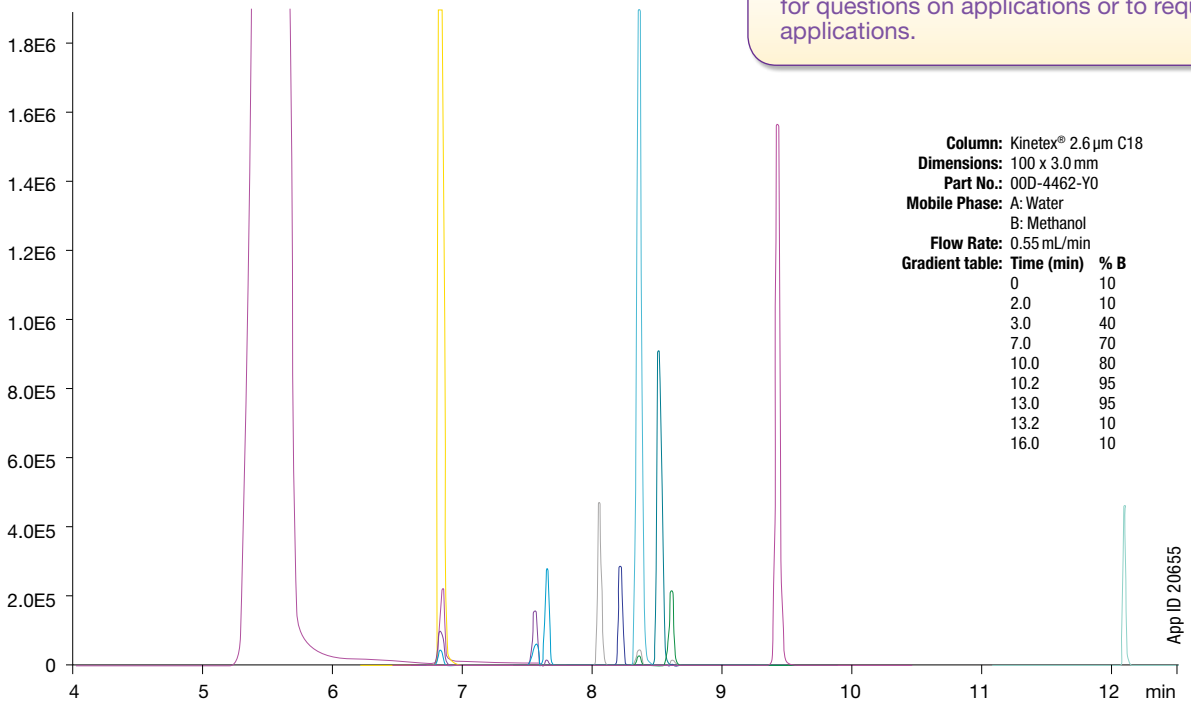
iMethod™ Available
Contact AB SCIEX or Phenomenex for details

AB SCIEX iMethod™ Test for Steroid Panel Version 1.1 for Cliquid® Software

TIP:
Consider Impact™ for high throughput protein precipitation. See **www.phenomenex.com/impact**

Steroids Panel

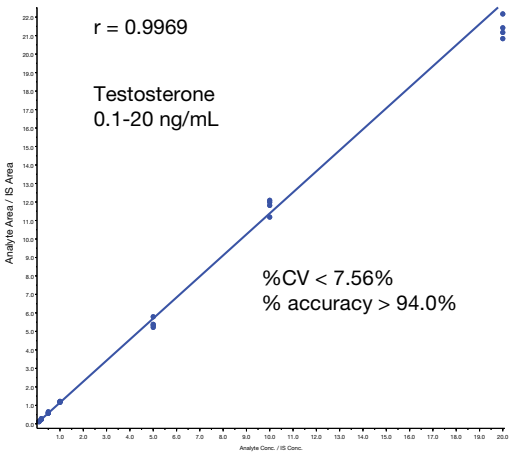
Questions or Requests?
Contact **ClinicalResearch@phenomenex.com** for questions on applications or to request additional applications.

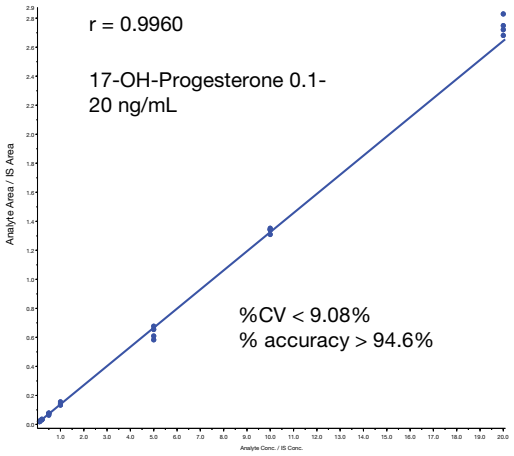


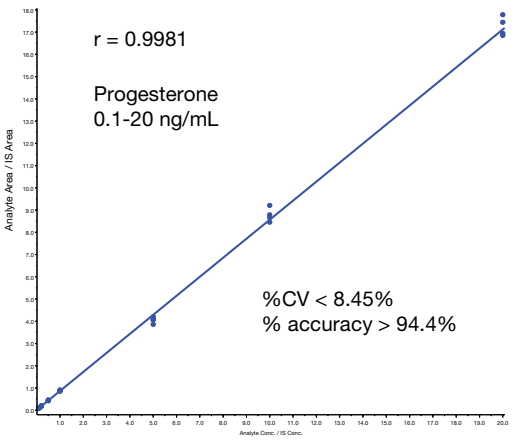
Column: Kinetex® 2.6 µm C18
Dimensions: 100 x 3.0 mm
Part No.: 00D-4462-Y0
Mobile Phase: A: Water
B: Methanol
Flow Rate: 0.55 mL/min
Gradient table:

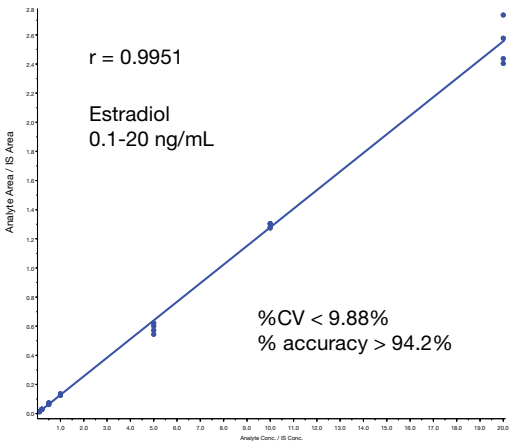
Time (min)	% B
0	10
2.0	10
3.0	40
7.0	70
10.0	80
10.2	95
13.0	95
13.2	10
16.0	10

Standard calibration curves (n=4)



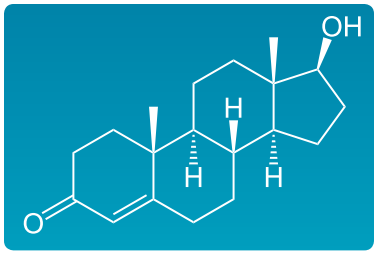






Total Testosterone

Total testosterone analysis is useful for determining testicular function in males and diagnosing abnormal physical characteristics related to bodily development.



Testosterone

Method Highlights

- Excellent sample cleanup from plasma using Strata™-X-A SPE
- Fast run time in less than 3 minutes using Gemini® NX-C18 HPLC columns

Also available in 96-well format

SAMPLE PREPARATION

Summary: Total testosterone was extracted from human plasma using Strata-X-A 30 mg/3 mL SPE cartridges

Part No.: 8B-S123-TBJ

SAMPLE PRETREATMENT

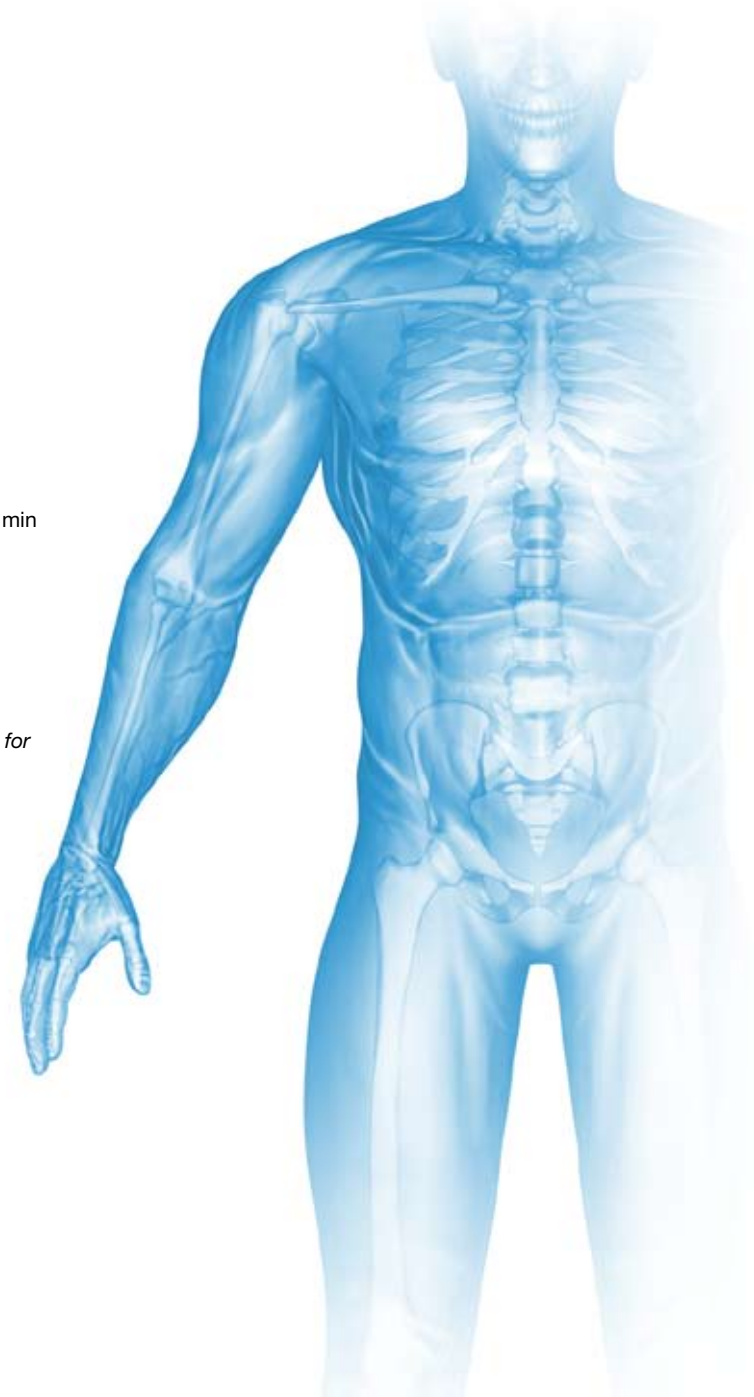
1. Dilute 0.25 mL of sample with 1 mL DI water and 0.1 mL IS solution (2 ng/mL Testosterone-D3 in Methanol)
2. Proceed to SPE Procedure

SPE PROCEDURE

1. Conditions: 1 mL 100 % Methanol
2. Equilibrate: 1 mL Water
3. Load: pretreated sample
4. Wash: 0.6 mL 50 % Methanol
5. Dry: SPE Bed under vacuum
6. Elute: 2 x 0.3 mL 100 % Methanol
7. Evaporate: to dryness at 50-55 °C under a stream of Nitrogen
8. Add: 0.05 mL 25 % Hydroxylamine to form oxime and heat for 5-6 min at 60-65 °C
9. Add: 0.2 mL 5 % Formic acid in DI Water
10. Inject: 25 µL onto the column

Note: The quantitation is based on the testosterone-oxime derivative

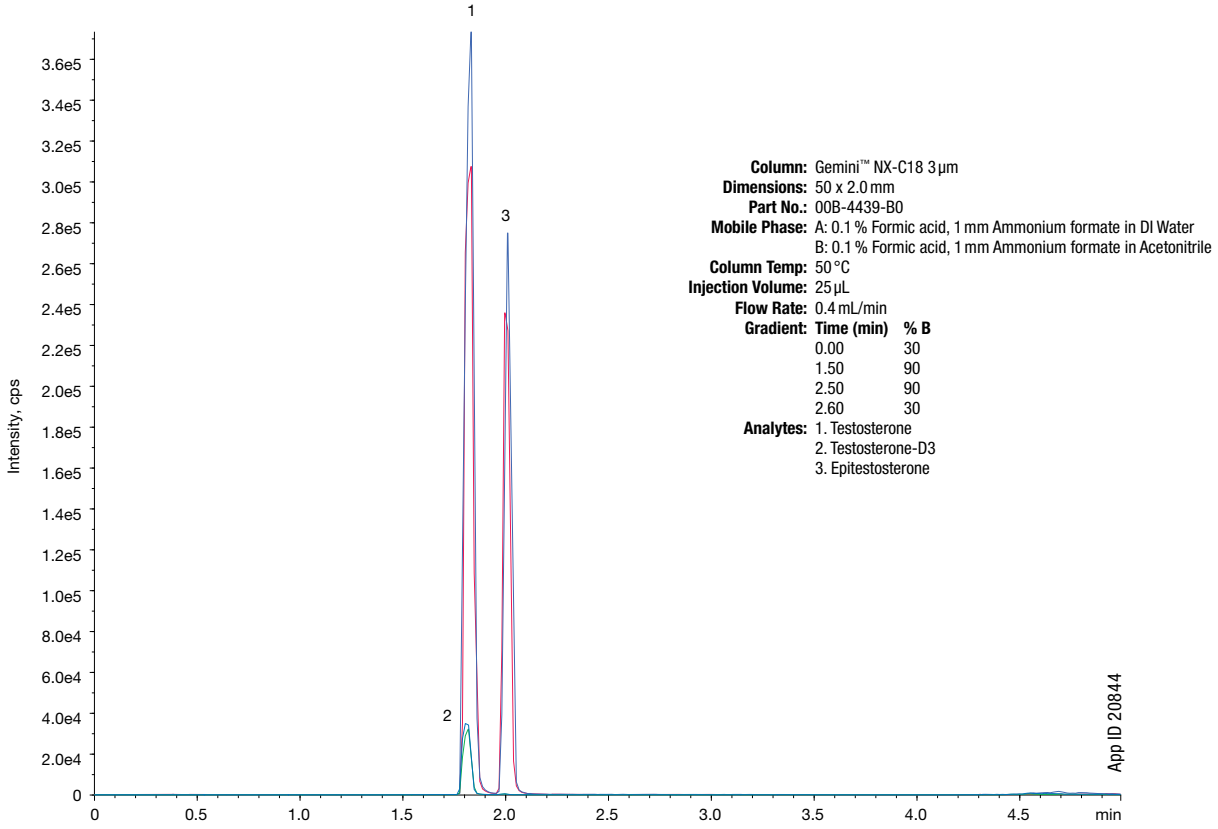
See *Performance Characteristics of a Novel Tandem Mass Spectrometry Assay for Serum Testosterone*. Kushnir, Mark M, et al. ARUP Institute for Clinical and Experimental Pathology, Salt Lake City, UT 84108, USA.
Clin Chem 52:120-8. 2006 Jan.



Total Testosterone

LC/MS/MS METHOD

Analyte	Q1	Q3
Testosterone	304.3	124.0
	304.3	112.0
Testosterone-D3	307.3	112.0
	307.3	124.0

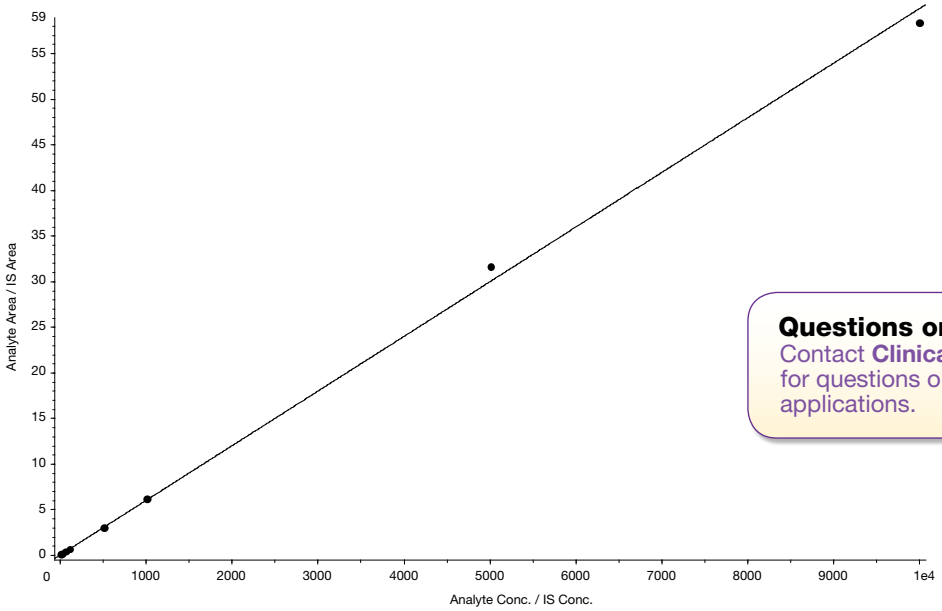


Column: Gemini™ NX-C18 3 µm
Dimensions: 50 x 2.0 mm
Part No.: 00B-4439-B0
Mobile Phase: A: 0.1 % Formic acid, 1 mm Ammonium formate in DI Water
B: 0.1 % Formic acid, 1 mm Ammonium formate in Acetonitrile
Column Temp: 50 °C
Injection Volume: 25 µL
Flow Rate: 0.4 mL/min

Gradient:	**Time (min)**	**% B**
	0.00	30
	1.50	90
	2.50	90
	2.60	30

Analytes: 1. Testosterone
2. Testosterone-D3
3. Epitestosterone

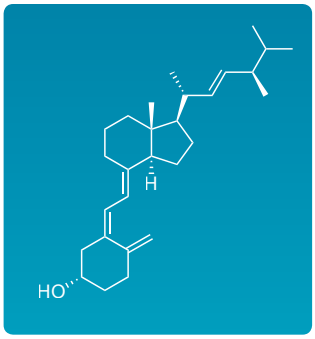
Calibration Curve 1 ng/dL – 1,000 ng/dL



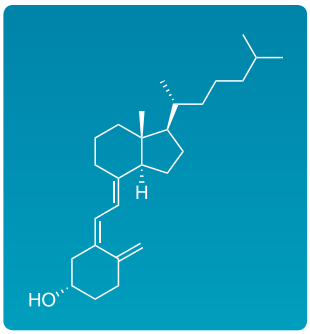
Questions or Requests?
Contact **ClinicalResearch@phenomenex.com** for questions on applications or to request additional applications.

25-OH-Vitamin D_2 and D_3

Vitamin D is recognized as an essential nutrient for intestinal absorption of calcium and phosphate and for promoting bone resorption and formation. Deficiency can lead to bone diseases such as rickets and osteomalacia. Vitamin D levels are measured by the total serum concentrations of the two common forms of 25-OH Vitamin D, which are 25-OH D_2 and 25-OH D_3.



Vitamin D_2 – ergocalciferol



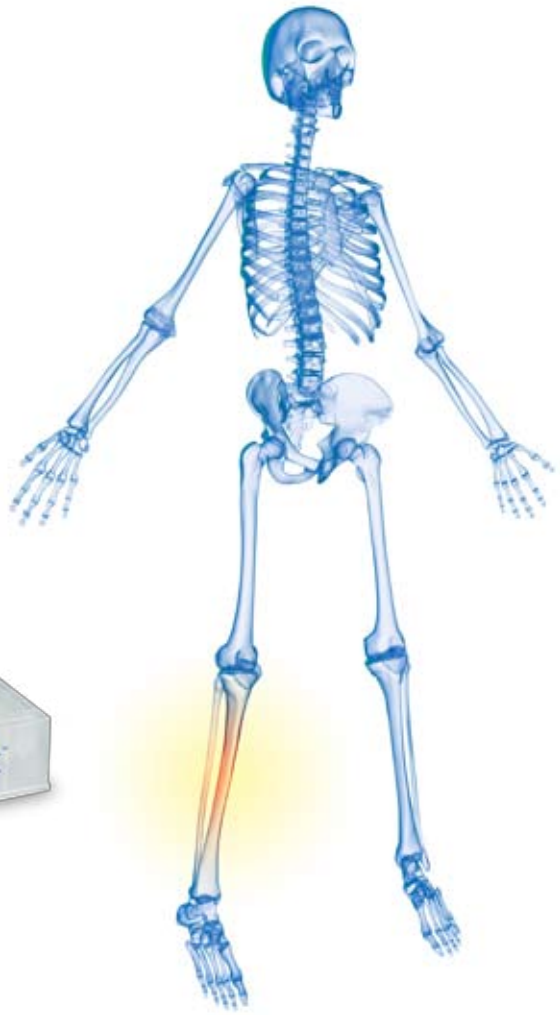
Vitamin D_3 – cholecalciferol

Method Highlights

- Customer-submitted patient sample run on a multi-channel system
- 40-50 µL injection volume

SAMPLE PREPARATION

1. Add: 50 µL of the precipitating reagent containing internal standard to a 1.5 mL centrifuge tube
2. Pipette: 100 µL of serum into a centrifuge tube
3. Vortex: 20 – 30 seconds
4. Inspect: each tube to ensure no unmixed sample remains in the bottom of the tube.
   i. A homogeneous mixture is critical
   ii. If unmixed sample remains at the bottom of the tube, dislodge by inverting and tapping, then re-vortex
5. Centrifuge: 15 minutes at 13,000 rpm
6. Transfer: supernatant into sample vial without disturbing the pellet



TIP:
Consider Impact™ for high throughput protein precipitation. See **www.phenomenex.com/impact**

25-OH-Vitamin D_2 and D_3

LC/MS/MS ANALYSIS

Analyte	Q1	Q3
25-OH D2	395.3	209.3
25-OH D3	383.2	257.2
25-OH D3-d6	389.3	263.3

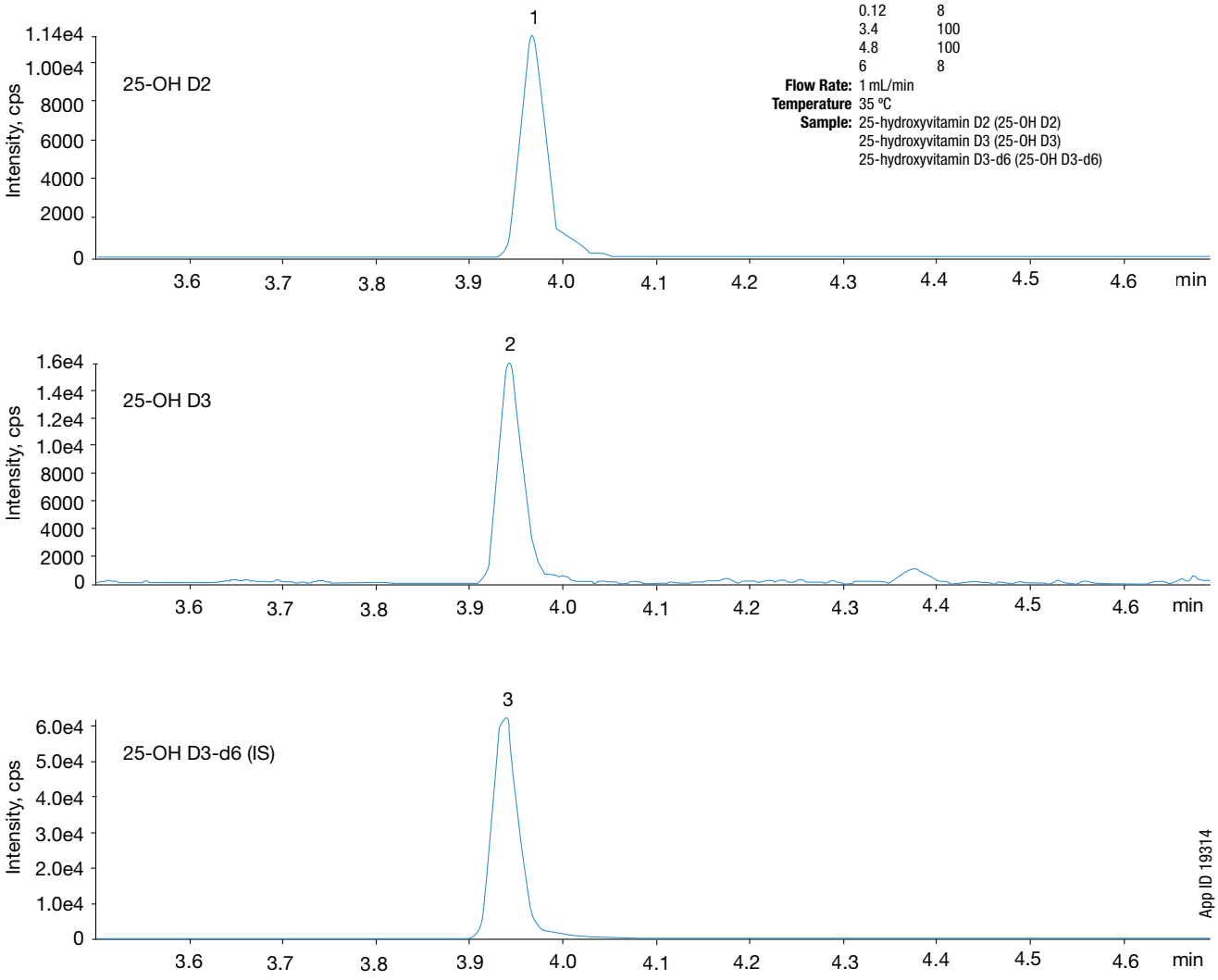
Patient Sample Chromatogram run on a multi-channel system

Column: Kinetex® 2.6 µm C18
Dimensions: 50 x 4.6 mm
Part No.: 00B-4462-E0
Mobile Phase: A: 0.05 % Formic acid
B: 5 mM Ammonium acetate with 0.1 % Formic Acid in Methanol

Gradient:

Time (min)	% B
0	8
0.12	8
3.4	100
4.8	100
6	8

Flow Rate: 1 mL/min
Temperature 35 °C
Sample: 25-hydroxyvitamin D2 (25-OH D2)
25-hydroxyvitamin D3 (25-OH D3)
25-hydroxyvitamin D3-d6 (25-OH D3-d6)



Request our technical note on 25-OH-VitaminD_2 and D_3!

TN-1055

Questions or Requests?
Contact **ClinicalResearch@phenomenex.com** for questions on applications or to request additional applications.

25-OH-Vitamin D_3 and 3-epi-25-OH-Vitamin D_3

Vitamin D (Ergocalciferol, D_2 and Cholecalciferol, D_3) has been under intense investigations and its beneficial health effects have been associated with various treatments from treating bone deficiency to a potent anticancer agent. However, isomerization of monohydroxy Vitamin D produces 3-epi (conversion of α-OH to ß-OH), a diasteromeric form. There is some ambiguity as to the clinical significance of the 3-epi isomer in general population and is currently under investigation.

Method Highlights

- Good separation of 25-OH-Vitamin D_3 and 3-epi-25-OH-Vitamin D_3 for accurate quantitation using Kinetex® 2.6 µm PFP
- Fast run time in less than 5 minutes

LC/MS/MS ANALYSIS

Column: Kinetex 2.6 µm PFP
Dimensions: 100 x 2.1 mm
Part No.: 00D-4477-AN
Temperature: Ambient
Mobile Phase: A: 0.1 % Formic acid in DI Water
B: 0.1 % Formic acid in Methanol
Flow Rate: 0.4 mL/min
Gradient:

Time (min)	% B
0	75
2.00	80
3.80	80
3.81	75
6.00	75

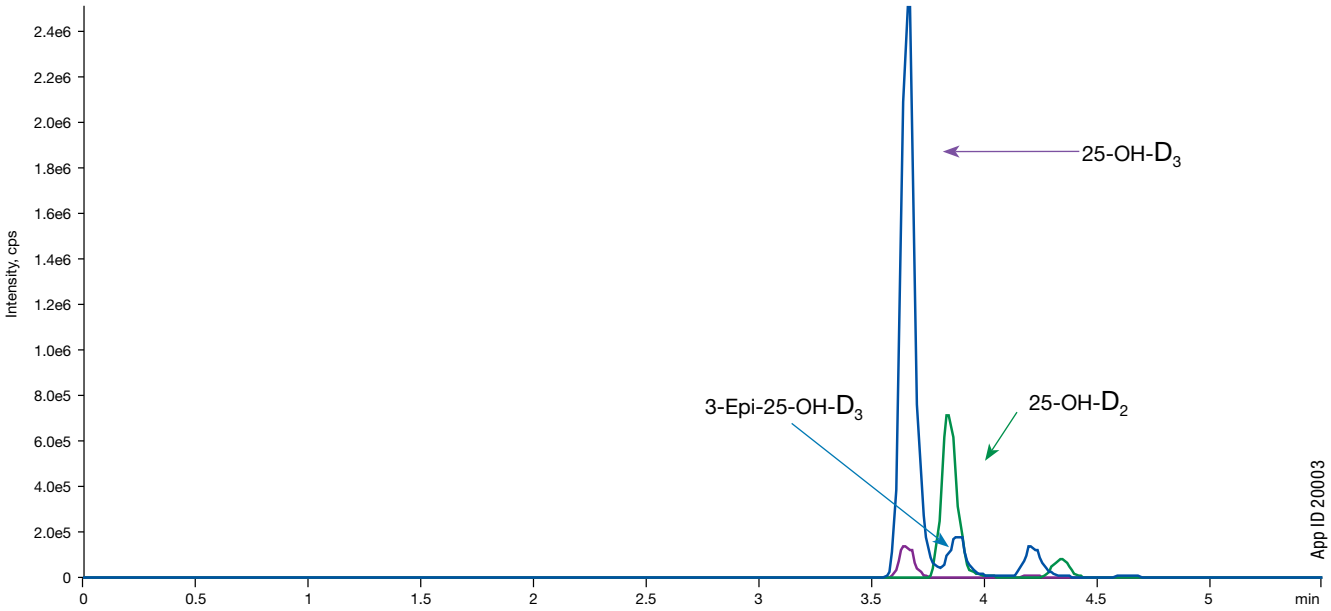
Request our technical note on 3-epi-25-OH Vitamin D_3!

TN-1130

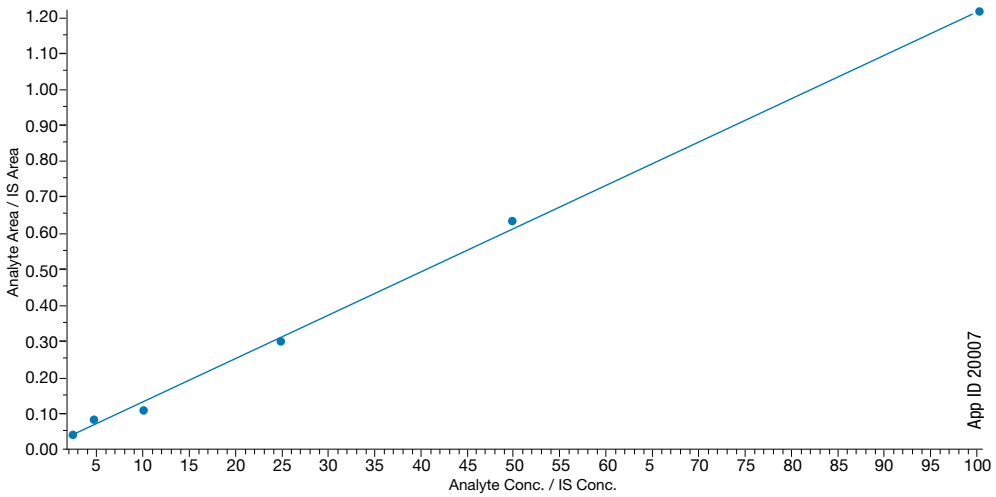
MRM TRANSITIONS

Analyte	Q1	Q3
OH-Vit D2	395.3	209.3
OH-Vit D3/Epi-D3	383.2	257.2
IS (OH-D3-2H3)	386.2	257.2
OH-Vit D3 (Sec trans)	383.2	229.1
OH-Vit D2 (Sec trans)	395.3	269.2

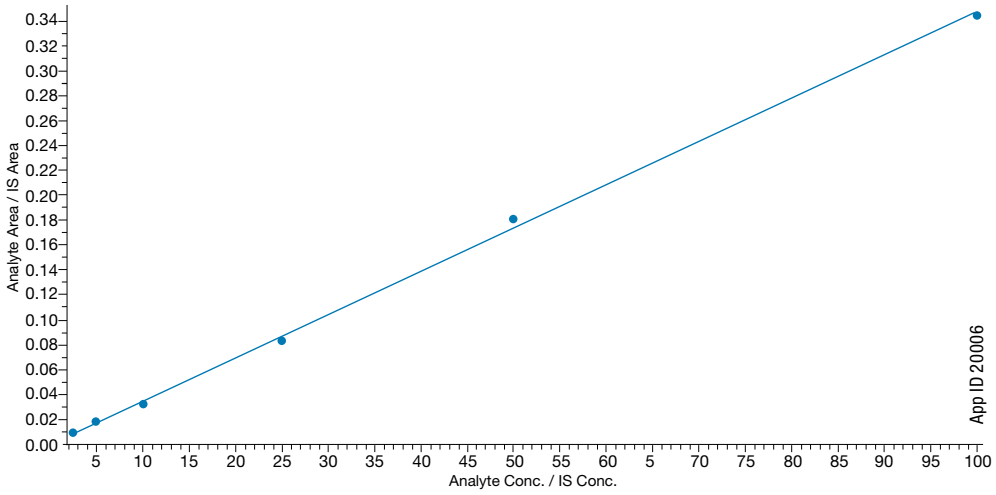
25-OH-Vitamin D_3 and 3-epi-25-OH-Vitamin D_3



OH-Vit D_3 Calibration Curve from 2.5 – 100 ng/mL

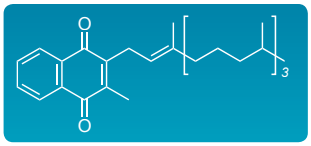


OH-Vit D_2 Calibration Curve from 2.5 – 100 ng/mL

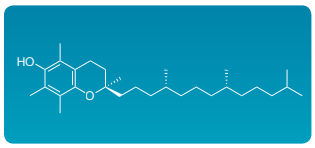


Vitamins – Fat Soluble

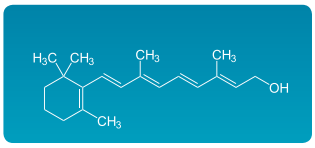
Fat soluble vitamins play an important role in healthy bone and teeth development, blood clotting, weight loss, and providing antioxidants. After consumption, fat soluble vitamins are absorbed through the intestinal tract, stored in body tissues and remain in the body longer than their water-soluble counterparts.



Vitamin K_1



Vitamin E



Vitamin A

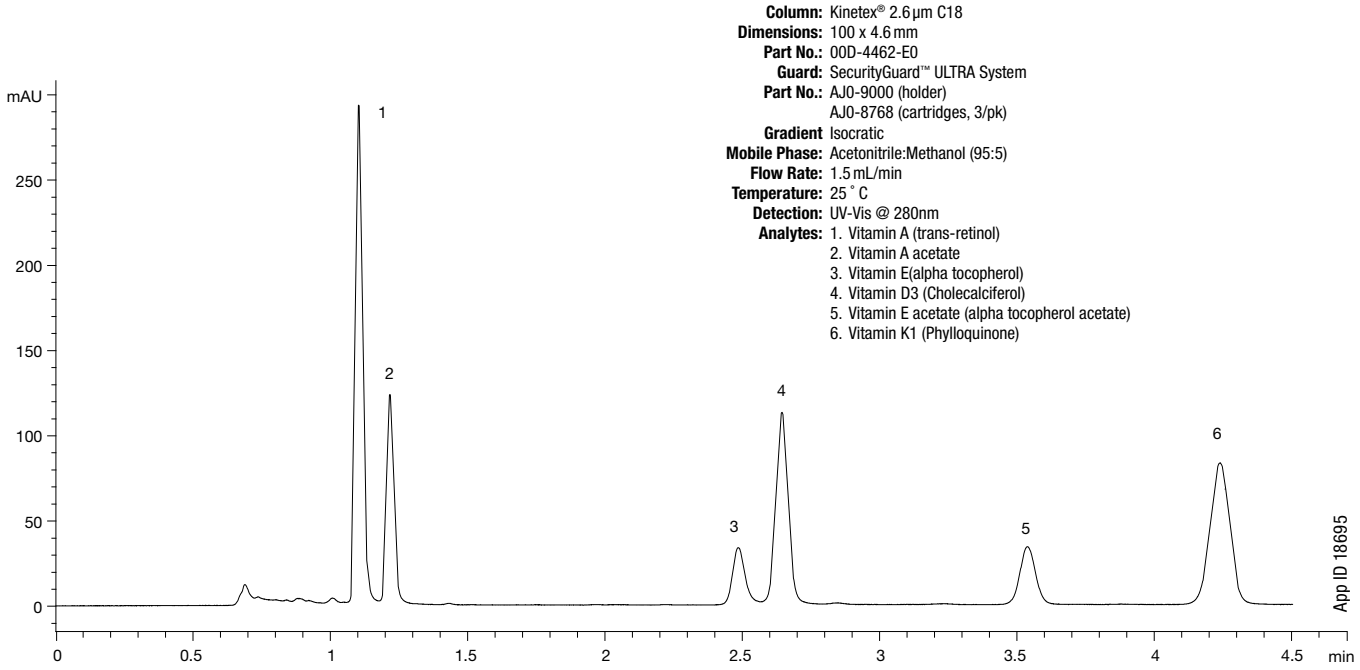
SAMPLE PREPARATION

1. The individual vitamin samples were prepared as follows:

Vitamin A-acetate (2 mg/mL)	Dissolve 2 mg of Vitamin A-acetate in 1 mL of Methanol.
Vitamin D_3 (2 mg/mL)	Dissolve 2 mg of Vitamin D_3 in 1 mL of Methanol.
Vitamin E (8 mg/mL)	Dissolve 8 mg of Vitamin E in 1 mL of Methanol.
Vitamin E-acetate (5 mg/mL)	Dissolve 5 mg of Vitamin E-acetate in 1 mL of Methanol.
Vitamin K_1 (5 mg/mL)	Dissolve 5 mg of Vitamin K_1 in 1 mL of Acetonitrile (Vitamin K_1 is not soluble in Methanol).

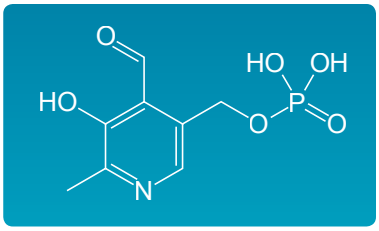
2. Each vitamin sample was diluted with appropriate solvents to 1 mg/mL.
3. 200 µL of each vitamin was mixed to yield the 5 vitamin mix.

HPLC ANALYSIS



Vitamin B_6

Vitamin B_6 currently refers to six biologically interconvertible 3-hydroxy-2-methylpyridine compounds: pyridoxal (PL), pyridoxine (PN), pyridoxamine (PM), and their respective 5'-phosphate (PLP, PNP, and PMP). Of these compounds, PLP is the primary biologically active form of vitamin B_6.



Vitamin B_6

Method Highlights

- Gemini®-NX HPLC columns provide baseline separation of PLP, 4-PA and PL
- Accurately quantitate PLP and 4-PA

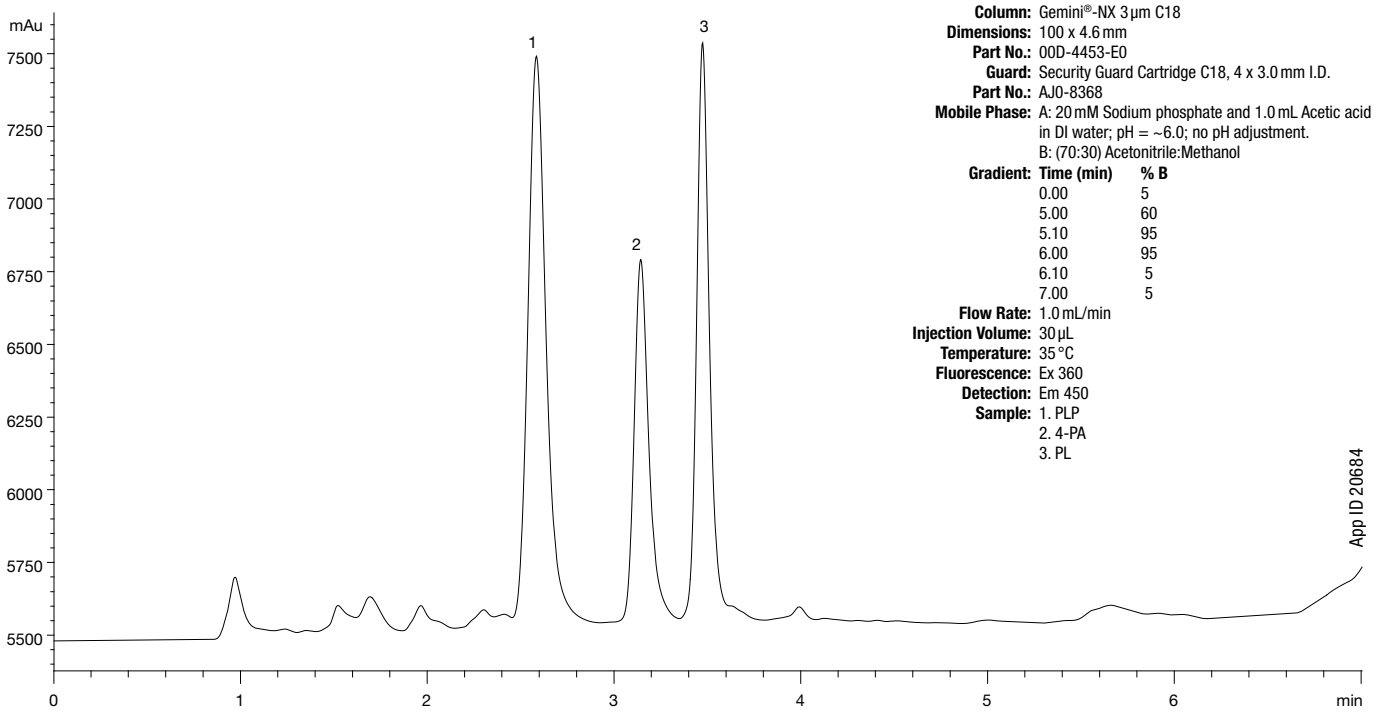
SAMPLE PREPARATION

1. Thaw patient plasma samples and sera/plasma spiked calibrators or pre-manufactured calibration standards and controls at ambient temperature. Protect from light.
2. Pipette 400 µL of the blank (Water), calibration standards, controls and plasma specimens into the appropriate labeled 1.5 mL Eppendorf microcentrifuge tubes.
    i. Briefly vortex the calibrators and controls immediately prior to sampling.
    ii. Mix the plasma samples by gentle inversion immediately prior to sampling.
    iii. Protect the tubes from light
3. Add 30 µL of 250 mg/mL semicarbazide/glycine solution in rapid succession into all the tubes containing samples; cap the tubes, vortex for 15 seconds.
4. Incubate in the dark at room temperature for 30 minutes.
5. Uncap the tubes; add 50 µL of 20 % meta-Phosphoric acid to the controls and patient samples.
6. Recap the tubes and vortex for 30 seconds at room temperature.
7. Centrifuge for 5 minutes at 14,000 rpm. Note: The relative centrifugal force (RCF)=16,000 g.
8. Transfer 350 µL of supernatant to a 2 mL amber vial.
9. Cover the vial with lid and place in the autosampler (RT).
10. Inject 30 µL.

Vitamin B_6

HPLC ANALYSIS

Sample chromatogram of semicarbazide derivatized PLP and PL using Gemini® 3 µm NX-C18 HPLC column (100 x 4.6 mm I.D.)



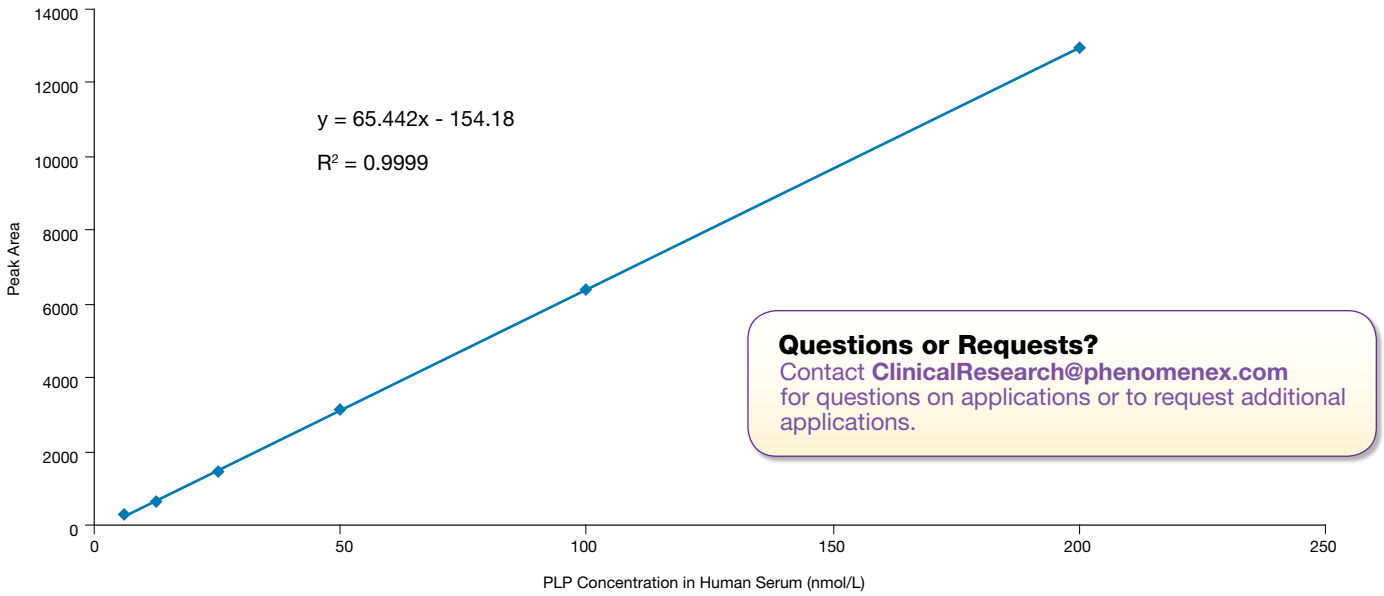
Column: Gemini®-NX 3 µm C18
Dimensions: 100 x 4.6 mm
Part No.: 00D-4453-E0
Guard: Security Guard Cartridge C18, 4 x 3.0 mm I.D.
Part No.: AJ0-8368
Mobile Phase: A: 20 mM Sodium phosphate and 1.0 mL Acetic acid in DI water; pH = ~6.0; no pH adjustment.
B: (70:30) Acetonitrile:Methanol

Gradient:	**Time (min)**	**% B**
	0.00	5
	5.00	60
	5.10	95
	6.00	95
	6.10	5
	7.00	5

Flow Rate: 1.0 mL/min
Injection Volume: 30 µL
Temperature: 35 °C
Fluorescence: Ex 360
Detection: Em 450
Sample: 1. PLP
2. 4-PA
3. PL

HUMAN SERUM PLP STANDARD CURVE

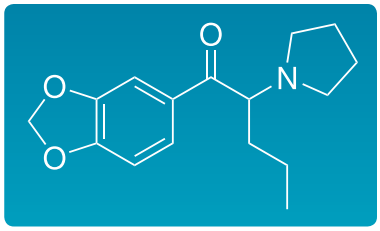
Example Standard Curve from 6.25 nmol/L to 200 nmol/L for PLP in Human Serum (external standard method)



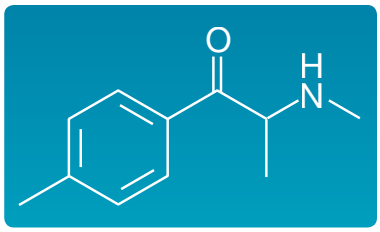
Questions or Requests?
Contact **ClinicalResearch@phenomenex.com** for questions on applications or to request additional applications.

Bath Salts

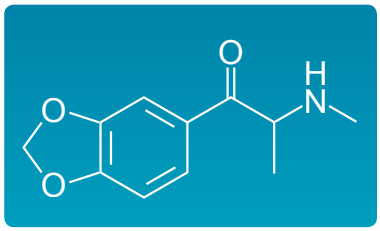
“Bath Salts” are among the newest designer drugs that target predominantly young people while attempting to stay ahead of existing anti-drug laws. Bath salts are similar to amphetamines in their chemical composition, effects and dangers.



MDPV



Mephedrone



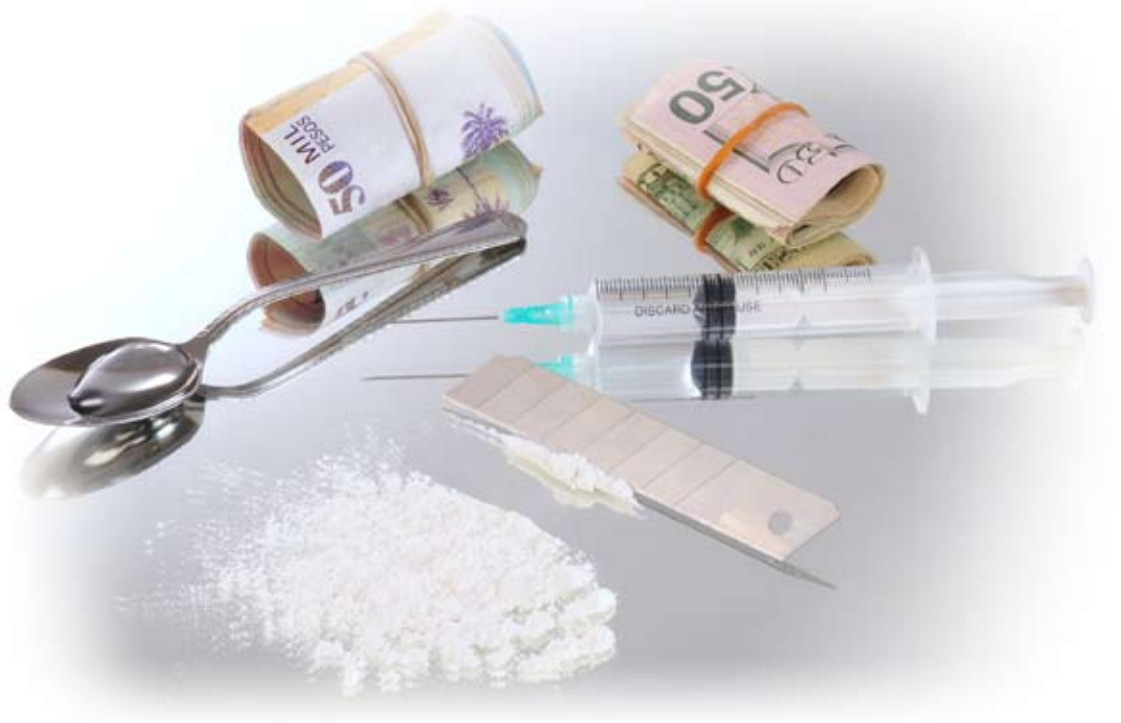
Methylone

Column: Kinetex® 2.6 µm C18 100Å
Dimensions: 50 x 3 mm
Part No.: 00B-4462-Y0
Mobile Phase: A: 10 mM Ammonium formate
B: Methanol with 0.1 % Formic acid
Gradient:

Time (min)	% B
0	5
3	100
4	100
4.1	5

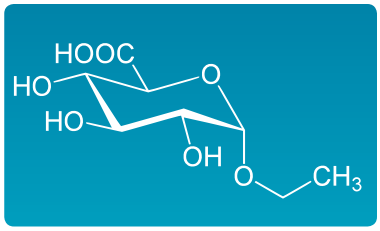
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detector Info: API 4000™
Sample: 1. Methylone
2. Mephedrone
3. MDPV
4. Methamphetamine

App ID 20739

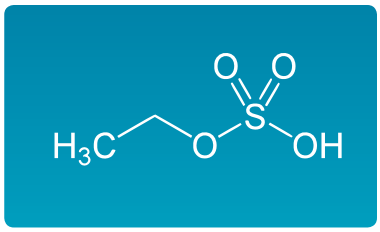


Ethyl glucuronide (EtG) and Ethyl sulfate (EtS)

Ethyl glucuronide (EtG) and Ethyl sulfate (EtS) are ethanol metabolites that indicate recent ingestion of alcohol. These metabolites can be detected in urine for up to 80 hours after ingestion, providing a more accurate tool for monitoring alcohol use and abuse compared to standard urine alcohol tests or breathalyzers.



EtG



EtS

Method Highlights

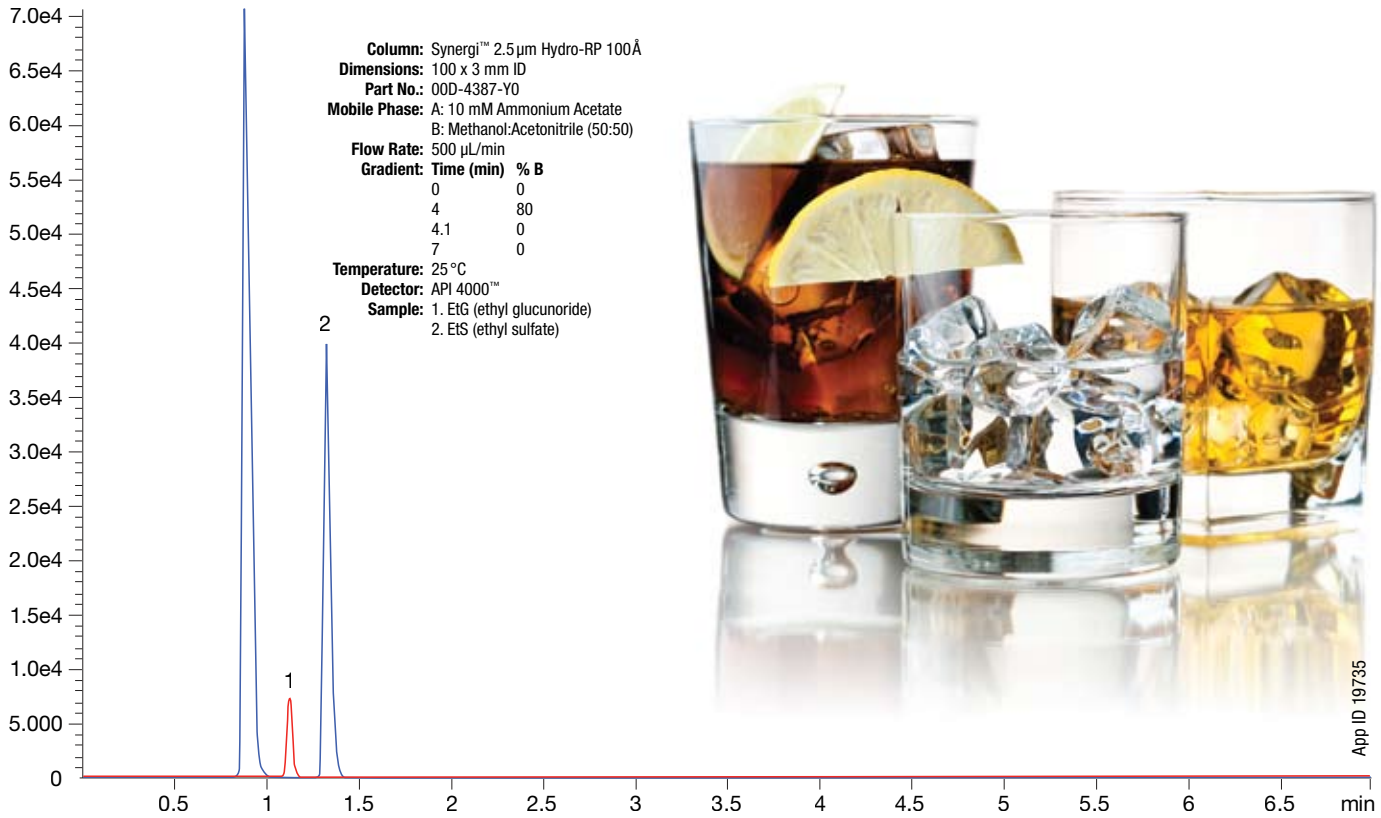
- Excellent retention of EtG and EtS

SAMPLE PREPARATION

Summary: The sample was diluted prior to injection.

LC/MS/MS ANALYSIS

Analyte	Q1	Q3
EtG	221.2	75.0
EtS	124.9	80.1

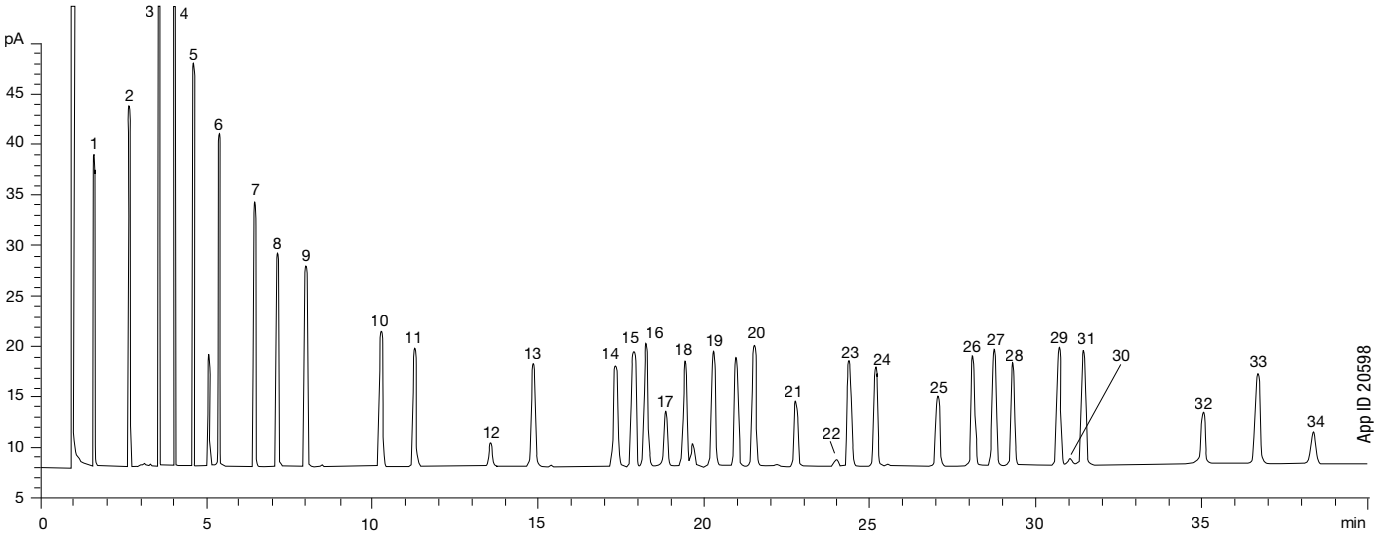


App ID 19735

Questions or Requests?
Contact **ClinicalResearch@phenomenex.com** for questions on applications or to request additional applications.

Very Long Chain Fatty Acids by GC/MS

Fatty Acid levels can be indicative of the effects of dietary intake, modifications, and supplements on one's health. Of particular interest are levels of cis and trans fatty acid levels due to the link between trans fats and cardiovascular disease.



Column: SGE® BPX70
Phase: 70 % cyanopropyl polysilphenyl-siloxane
Dimensions: 25 m x 0.32 mm x 0.25 µm
Part No.: CG0-5516
Oven Profile: 80 °C for 2 min to 130 °C @ 50 °C/min for 10 min to 172 °C @ 2 °C/min for 6 min
Carrier Gas: Constant Flow Helium, 2.2 mL/min
Injection: Split 48:1; 0.4 µL @ 250 °C
Detection: Flame Ionization (FID) (300 °C)
Liner: AG0-7515, 4 mm ID FocusLiner™
Analyst Note: Analytes are 100 ppm in Hexane
Analytes:

1. C6
2. C8
3. C10
4. C11
5. C12
6. C13
7. C14
8. C14:1 cis 9
9. C15
10. C16
11. C16:1 cis 9
12. C17
13. C17:1 cis 10
14. C18
15. C18:1 trans 9
16. C18:1 cis 9
17. C18:1 cis 12
18. C18:2 trans 9, 12
19. C18:2 cis 9, 12
20. C18:3 cis 6, 9, 12
21. C18:3 cis 9, 12, 15
22. C18:4 Cis 6, 9, 12, 15
23. C20
24. C21:1 cis 11

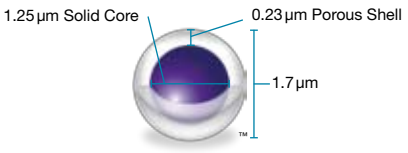
Chromatogram and conditions courtesy of Masterfoods UK.

Columns for LC/MS/MS Separations

CORE-SHELL TECHNOLOGY

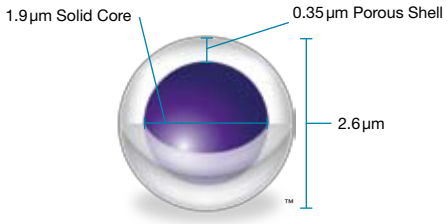
Ultra High Performance on ANY LC System

- Get sub-2 µm performance and speeds on any LC system
- Increase your throughput without loss of critical pair resolution
- Save money by using less solvent due to faster runtimes



Kinetex 1.7 µm Core-Shell Particle

- Reduced diffusion path maximizes efficiency
- Increased efficiencies compared to traditional fully porous sub-2 µm columns. Typical operating backpressures > 400 bar



Kinetex 2.6 µm Core-Shell Particle

- Reduced diffusion path maximizes efficiency
- Ultra-high performance on any HPLC or UHPLC system with Kinetex 2.6 µm columns

FULLY POROUS PARTICLE SOLUTIONS

The Standard for pH Method Development

- Rugged, fully porous particles with excellent column lifetimes
- pH 1-12 stability allows for low and high pH mobile phases to optimize selectivity for ionizable compounds

Full Range Selectivity for Reversed Phase Separation

- 4 unique phases to optimize even the most challenging separations
- Available in 2.5 µm and 4 µm particles for high efficiencies

One of the World's Leading HPLC Columns

- Numerous phases including C18(2), Phenyl-hexyl, PFP(2), HILIC and others
- Available in 2.5 µm and 3 µm particles for high efficiencies

Kinetex®

Ordering Information

2.6 µm Analytical Columns (mm)						SecurityGuard™ ULTRA Cartridges‡
Phases	30 x 4.6	50 x 4.6	75 x 4.6	100 x 4.6	150 x 4.6	3/pk
XB-C18	—	00B-4496-E0	00C-4496-E0	00D-4496-E0	00F-4496-E0	AJ0-8768
C18	00A-4462-E0	00B-4462-E0	00C-4462-E0	00D-4462-E0	00F-4462-E0	AJ0-8768
C8	—	00B-4497-E0	00C-4497-E0	00D-4497-E0	00F-4497-E0	AJ0-8770
PFP	00A-4477-E0	00B-4477-E0	00C-4477-E0	00D-4477-E0	00F-4477-E0	AJ0-8773
HILIC	00A-4461-E0	00B-4461-E0	00C-4461-E0	00D-4461-E0	00F-4461-E0	AJ0-8772
Phenyl-Hexyl	—	00B-4495-E0	—	00D-4495-E0	00F-4495-E0	AJ0-8774
						for 4.6 mm ID

NEW 5 µm Columns Available!
Call for details

2.6 µm MidBore™ Columns (mm)						SecurityGuard ULTRA Cartridges‡
Phases	30 x 3.0	50 x 3.0	75 x 3.0	100 x 3.0	150 x 3.0	3/pk
XB-C18	00A-4496-Y0	00B-4496-Y0	00C-4496-Y0	00D-4496-Y0	00F-4496-Y0	AJ0-8775
C18	00A-4462-Y0	00B-4462-Y0	00C-4462-Y0	00D-4462-Y0	00F-4462-Y0	AJ0-8775
C8	00A-4497-Y0	00B-4497-Y0	00C-4497-Y0	00D-4497-Y0	00F-4497-Y0	AJ0-8777
PFP	00A-4477-Y0	00B-4477-Y0	00C-4477-Y0	00D-4477-Y0	00F-4477-Y0	AJ0-8780
HILIC	00A-4461-Y0	—	—	—	00F-4461-Y0	AJ0-8779
Phenyl-Hexyl	—	—	—	—	—	AJ0-8781
						for 3.0 mm ID

2.6 µm Minibore Columns (mm)					SecurityGuard ULTRA Cartridges‡
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
XB-C18	00A-4496-AN	00B-4496-AN	00D-4496-AN	00F-4496-AN	AJ0-8782
C18	00A-4462-AN	00B-4462-AN	00D-4462-AN	00F-4462-AN	AJ0-8782
C8	00A-4497-AN	00B-4497-AN	00D-4497-AN	00F-4497-AN	AJ0-8784
PFP	00A-4477-AN	00B-4477-AN	00D-4477-AN	00F-4477-AN	AJ0-8787
HILIC	00A-4461-AN	00B-4461-AN	00D-4461-AN	00F-4461-AN	AJ0-8786
Phenyl-Hexyl	—	00B-4495-AN	00D-4495-AN	—	AJ0-8788
					for 2.1 mm ID

1.7 µm MidBore Columns (mm)				SecurityGuard ULTRA Cartridges‡
Phases	30 x 3.0	50 x 3.0	100 x 3.0	3/pk
XB-C18	00A-4498-Y0	00B-4498-Y0	00D-4498-Y0	AJ0-8775
C18	—	00B-4475-Y0	00D-4475-Y0	AJ0-8775
C8	00A-4499-Y0	00B-4499-Y0	00D-4499-Y0	AJ0-8777
PFP	—	—	00D-4476-Y0	AJ0-8780
HILIC	—	00B-4474-Y0	—	AJ0-8779
Phenyl-Hexyl	—	—	—	AJ0-8781
				for 3.0 mm ID

1.7 µm Minibore Columns (mm)					SecurityGuard ULTRA Cartridges‡
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
XB-C18	00A-4498-AN	00B-4498-AN	00D-4498-AN	00F-4498-AN	AJ0-8782
C18	00A-4475-AN	00B-4475-AN	00D-4475-AN	00F-4475-AN	AJ0-8782
C8	00A-4499-AN	00B-4499-AN	00D-4499-AN	00F-4499-AN	AJ0-8784
PFP	00A-4476-AN	00B-4476-AN	00D-4476-AN	00F-4476-AN	AJ0-8787
HILIC	00A-4474-AN	00B-4474-AN	00D-4474-AN	—	AJ0-8786
Phenyl-Hexyl	—	00B-4500-AN	00D-4500-AN	00F-4500-AN	AJ0-8788
					for 2.1 mm ID

‡SecurityGuard ULTRA cartridges require holder, Part No.: AJ0-9000

guarantee

If Kinetex core-shell columns do not provide at least an equivalent separation as compared to a competing column of the same phase, return the column with the comparative data within 45 days for a FULL REFUND.

SecurityGuard™ ULTRA Cartridge System

The SecurityGuard ULTRA cartridge system protects ultra-high performance columns, like Kinetex, from damaging contaminants and microparticulates.

- Extend Kinetex column lifetime
- Simple to use
- Pressure rated to 20,000 psi (1,378 bar)
- Fits virtually all manufacturers' columns

SECURITYGUARD ULTRA CARTRIDGE HOLDERS

Part No.	Description	Unit	Price
AJ0-9000	SecurityGuard ULTRA Cartridge Holder	ea	

UHPLC / HPLC SURE-LOK™ HIGH PRESSURE PEEK MALE NUT FITTINGS

Part No.	Description	Unit	Price
AQ0-8503	Sure-Lok High Pressure PEEK 1-Pc Nut 10-32, for 1/16 in. Tubing, 12,000 psi (827 bar)	10/pk	
AQ0-8530	Sure-Lok Fitting Tightening Tool, Aluminum	ea	

AQ0-8503

AQ0-8530

U.S. Patent No. 7, 563, 367

Ordering Information

3 µm Microbore, Minibore and Narrow Bore Columns (mm)									SecurityGuard™ Cartridges (mm)
Phases	**50 x 1.0**	**20 x 2.0**	**30 x 2.0**	**50 x 2.0**	**100 x 2.0**	**150 x 2.0**	**50 x 3.0**	**100 x 3.0**	**150 x 3.0**	**4 x 2.0***
										/10pk
C18	00B-4439-A0	00M-4439-B0	00A-4439-B0	00B-4439-B0	00D-4439-B0	00F-4439-B0	00B-4439-Y0	00D-4439-Y0	00F-4439-Y0	AJ0-7596
C6-Phenyl	00B-4443-A0	—	00A-4443-B0	00B-4443-B0	00D-4443-B0	00F-4443-B0	00B-4443-Y0	00D-4443-Y0	00F-4443-Y0	AJ0-7914
	—	$ 479	$ 485	$ 545	$ 699	$ 789	$ 545	$ 735	$ 825	$ 355 /10pk
NX-C18	—	00M-4453-B0	00A-4453-B0	00B-4453-B0	00D-4453-B0	00F-4453-B0	00B-4453-Y0	00D-4453-Y0	00F-4453-Y0	AJ0-8367

for ID: 2.0-3.0 mm

3 µm Analytical Columns (mm)						SecurityGuard Cartridges (mm)
Phases	**20 x 4.0**	**30 x 4.6**	**50 x 4.6**	**100 x 4.6**	**150 x 4.6**	**250 x 4.6**	**4 x 3.0***
							/10pk
C18	00M-4439-D0	00A-4439-E0	00B-4439-E0	00D-4439-E0	00F-4439-E0	00G-4439-E0	AJ0-7597
C6-Phenyl	—	00A-4443-E0	00B-4443-E0	00D-4443-E0	00F-4443-E0	00G-4443-E0	AJ0-7915
	—	—	$ 545	$ 699	$ 775	$ 829	$ 355 /10pk
NX-C18	—	—	00B-4453-E0	00D-4453-E0	00F-4453-E0	00G-4453-E0	AJ0-8368

for ID: 3.2-8.0 mm

5 µm Minibore and Narrow Bore Columns (mm)									SecurityGuard Cartridges (mm)
Phases	**30 x 2.0**	**50 x 2.0**	**150 x 2.0**	**250 x 2.0**	**50 x 3.0**	**100 x 3.0**	**150 x 3.0**	**250 x 3.0**	**4 x 2.0***
									/10pk
C18	00A-4435-B0	00B-4435-B0	00F-4435-B0	00G-4435-B0	00B-4435-Y0	00D-4435-Y0	00F-4435-Y0	00G-4435-Y0	AJ0-7596
C6-Phenyl	00A-4444-B0	00B-4444-B0	00F-4444-B0	—	00B-4444-Y0	—	00F-4444-Y0	00G-4444-Y0	AJ0-7914
	$ 465	$ 535	$ 719	—	$ 515	$ 675	$ 765	$ 795	$ 355 /10pk
NX-C18	00A-4454-B0	00B-4454-B0	00F-4454-B0	—	00B-4454-Y0	00D-4454-Y0	00F-4454-Y0	00G-4454-Y0	AJ0-8367

for ID: 2.0-3.0 mm

5 µm Analytical Columns (mm)						SecurityGuard Cartridges (mm)
Phases	**30 x 4.6**	**50 x 4.6**	**100 x 4.6**	**150 x 4.6**	**250 x 4.6**	**4 x 3.0***
						/10pk
C18	00A-4435-E0	00B-4435-E0	00D-4435-E0	00F-4435-E0	00G-4435-E0	AJ0-7597
C6-Phenyl	00A-4444-E0	00B-4444-E0	00D-4444-E0	00F-4444-E0	00G-4444-E0	AJ0-7915
	—	$ 505	$ 675	$ 745	$ 779	$ 355 /10pk
NX-C18	—	00B-4454-E0	00D-4454-E0	00F-4454-E0	00G-4454-E0	AJ0-8368

for ID: 3.2-8.0 mm

*SecurityGuard™ Analytical Cartridges require holder, Part No.: KJ0-4282

guarantee

If Gemini analytical columns do not provide at least an equivalent separation as compared to a competing column of the same particle size, similar phase and dimensions, return the column with comparative data within 45 days for a full refund.

Solid Phase Extraction for Optimal Clean Up

Strata-X

U.S. Patent No. 7,119,145

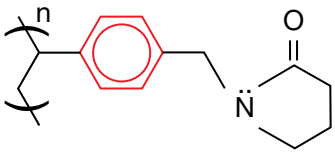
A reversed phase functionalized polymeric sorbent that gives strong retention of neutral, acidic, or basic compounds under aggressive, high organic wash conditions.

Material Characteristics

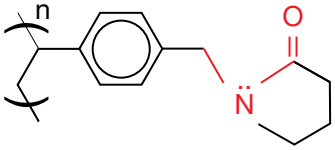
Particle Size (µm)	33
Pore Size (Å)	85
Surface Area (m^2/g)	800
pH Stability	1-14

3 Mechanisms of Retention

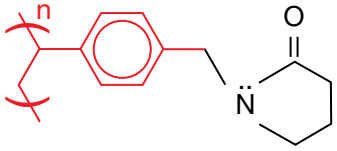
π-π Bonding



Hydrogen Bonding Dipole-Dipole Interactions



Hydrophobic Interaction



STRATA-X

Ordering Information

Format	Sorbent Mass	Part Number	Unit	Price
Tube				
	30 mg	8B-S100-TAK	1 mL (100/box)	
	30 mg	8B-S100-TBJ	3 mL (50/box)	
	60 mg	8B-S100-UBJ	3 mL (50/box)	
	100 mg	8B-S100-EBJ	3 mL (50/box)	
	100 mg	8B-S100-ECH	6 mL (30/box)	
	200 mg	8B-S100-FBJ	3 mL (50/box)	
	200 mg	8B-S100-FCH	6 mL (30/box)	
	500 mg	8B-S100-HBJ	3 mL (50/box)	
	500 mg	8B-S100-HCH	6 mL (30/box)	
Giga™ Tube				
	500 mg	8B-S100-HDG	12 mL (20/box)	
	1 g	8B-S100-JDG	12 mL (20/box)	
	1 g	8B-S100-JEG	20 mL (20/box)	
	2 g	8B-S100-KEG	20 mL (20/box)	
	5 g	8B-S100-LFF	60 mL (16/box)	
Teflon® Tube				
	200 mg	8B-S100-FBJ-T	3 mL (50/box)	
	200 mg	8B-S100-FDG-T	12 mL (20/box)	
96-Well Plate				
	10 mg	8E-S100-AGB	2 Plates/Box	
	30 mg	8E-S100-TGB	2 Plates/Box	
	60 mg	8E-S100-UGB	2 Plates/Box	

On-line Extraction Cartridge

Description	Part Number	Unit/Box	Price
Strata-X on-line extraction cartridge, 20 x 2.0 mm	00M-S033-B0-CB	ea	
Cartridge holder, 20 mm	CH0-5845	ea	

GENERAL EXTRACTION PROTOCOL

Method written for a 30 mg/1 mL tube

1. Condition: 1 mL Methanol followed by 1 mL DI Water
2. Load: Pretreated sample
3. Wash: 1 mL 5-60 % Methanol in DI Water.
4. Dry: sorbent for 30 seconds
5. Elute: 2x 500 µL 2 % Formic acid in Methanol or Acetonitrile

guarantee

If Strata-X SPE products do not perform as well or better than your current SPE product of similar phase, mass and size, return the product with comparative data within 45 days for a FULL REFUND.

Instant Method Development

Create your Own SPE Method in under 1 minute!

www.phenomenex.com/Tools/SPEMethodDevelopment

Strata-X-C

U.S. Patent No. 7,119,145

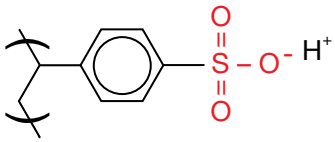
A strong cation-exchange functionalized polymeric sorbent that allows for complete retention of basic compounds with a pK_a less than 10.5, making 100 % organic wash conditions possible.

Material Characteristics

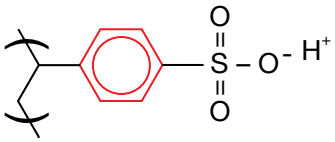
Particle Size (µm)	33
Pore Size (Å)	85
Surface Area (m^2/g)	800
pH Stability	1-14
Ionic Capacity	1 meq/g
pK_a	~ 0

3 Mechanisms of Retention

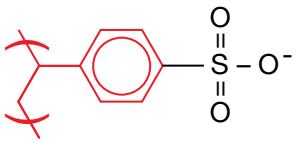
Strong Cation-Exchange



π-π Bonding



Hydrophobic Interaction



STRATA-X-C

Ordering Information

Format	Sorbent Mass	Part Number	Unit	Price
Tube				
	30 mg	8B-S029-TAK	1 mL (100/box)	
	30 mg	8B-S029-TBJ	3 mL (50/box)	
	60 mg	8B-S029-UBJ	3 mL (50/box)	
	100 mg	8B-S029-EBJ	3 mL (50/box)	
	100 mg	8B-S029-ECH	6 mL (30/box)	
	200 mg	8B-S029-FBJ	3 mL (50/box)	
	200 mg	8B-S029-FCH	6 mL (30/box)	
	500 mg	8B-S029-HBJ	3 mL (50/box)	
	500 mg	8B-S029-HCH	6 mL (30/box)	
Giga™ Tube				
	500 mg	8B-S029-HDG	12 mL (20/box)	
	1 g	8B-S029-JDG	12 mL (20/box)	
	1 g	8B-S029-JEG	20 mL (20/box)	
	2 g	8B-S029-KEG	20 mL (20/box)	
	5 g	8B-S029-LFF	60 mL (16/box)	
96-Well Plate				
	10 mg	8E-S029-AGB	2 Plates/Box	
	30 mg	8E-S029-TGB	2 Plates/Box	
	60 mg	8E-S029-UGB	2 Plates/Box	

On-line Extraction Cartridge

Description	Part Number	Unit/Box	Price
Strata-X-C on-line extraction cartridge, 20 x 2.0 mm	00M-S048-B0-CB	ea	$ 365
Cartridge holder, 20 mm	CH0-5845	ea	115

GENERAL EXTRACTION PROTOCOL

Method written for a 30 mg/1 mL tube

1. Condition: 1 mL Methanol followed by 1 mL DI Water
2. Load: Pretreated sample
3. Wash: 1 mL 0.1 N Hydrochloric acid in DI Water followed by 1 mL 0.1 N Hydrochloric acid in Methanol
4. Elute: 2x 500 µL 5 % Ammonium hydroxide in Methanol or Acetonitrile

guarantee

If Strata-X SPE products do not perform as well or better than your current SPE product of similar phase, mass and size, return the product with comparative data within 45 days for a FULL REFUND.

Instant Method Development

Create your Own SPE Method in under 1 minute!

www.phenomenex.com/Tools/SPEMethodDevelopment

Strata-X-CW

U.S. Patent No. 7,119,145

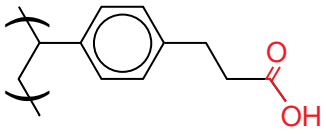
A weak cation-exchange functionalized polymeric sorbent that allows for complete retention of basic compounds with a pK_a greater than 8, including quaternary amines, making 100 % organic wash conditions possible.

Material Characteristics

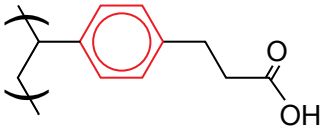
Particle Size (µm)	33
Pore Size (Å)	85
Surface Area (m^2/g)	800
pH Stability	1-14
Ionic Capacity	0.76 meq/g
pK_a	~ 4.5

3 Mechanisms of Retention

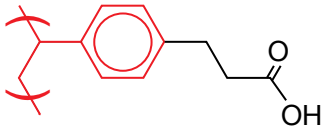
Weak Cation-Exchange



π-π Bonding



Hydrophobic Interaction



STRATA-X-CW

Ordering Information

Format	Sorbent Mass	Part Number	Unit	Price
Tube				
	30 mg	8B-S035-TAK	1 mL (100/box)	
	30 mg	8B-S035-TBJ	3 mL (50/box)	
	60 mg	8B-S035-UBJ	3 mL (50/box)	
	100 mg	8B-S035-ECH	6 mL (30/box)	
	200 mg	8B-S035-FBJ	3 mL (50/box)	
	200 mg	8B-S035-FCH	6 mL (30/box)	
	500 mg	8B-S035-HBJ	3 mL (50/box)	
	500 mg	8B-S035-HCH	6 mL (30/box)	
Giga™ Tube				
	500 mg	8B-S035-HDG	12 mL (20/box)	
	1 g	8B-S035-JDG	12 mL (20/box)	
	1 g	8B-S035-JEG	20 mL (20/box)	
	2 g	8B-S035-KEG	20 mL (20/box)	
	5 g	8B-S035-LFF	60 mL (16/box)	
96-Well Plate				
	10 mg	8E-S035-AGB	2 Plates/Box	
	30 mg	8E-S035-TGB	2 Plates/Box	
	60 mg	8E-S035-UGB	2 Plates/Box	

On-line Extraction Cartridge

Format	Part Number	Unit/Box	Price
Strata-X-CW on-line extraction cartridge, 20 x 2.0 mm	00M-S036-B0-CB	ea	
Cartridge holder, 20 mm	CH0-5845	ea	

GENERAL EXTRACTION PROTOCOL

Method written for a 30 mg/1 mL tube

1. Condition: 1 mL Methanol followed by 1 mL DI Water
2. Load: Pretreated sample
3. Wash: 1 mL DI Water followed by 1 mL Methanol
4. Elute: 2x 500 µL 5 % Formic acid in Methanol or Acetonitrile

guarantee

If Strata-X SPE products do not perform as well or better than your current SPE product of similar phase, mass and size, return the product with comparative data within 45 days for a FULL REFUND.

Instant Method Development

Create your Own SPE Method in under 1 minute!

www.phenomenex.com/Tools/SPEMethodDevelopment

Strata-X-A

U.S. Patent No. 7,119,145

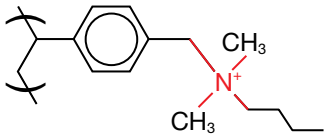
A strong anion-exchange functionalized polymeric sorbent that allows for complete retention of weakly acidic compounds with pK_a greater than 2, making 100 % organic wash conditions possible.

Material Characteristics

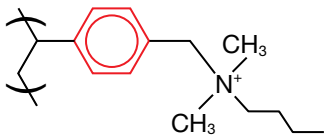
Particle Size (µm)	33
Pore Size (Å)	85
Surface Area (m^2/g)	800
pH Stability	1-14
Ionic Capacity	0.30 meq/g
pK_a	~ 14

3 Mechanisms of Retention

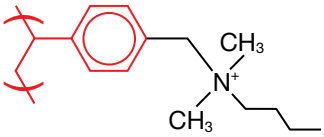
Strong Anion-Exchange



π-π Bonding



Hydrophobic Interaction



STRATA-X-A

Ordering Information

Format	Sorbent Mass	Part Number	Unit	Price
Tube				
	30 mg	8B-S123-TAK	1 mL (100/box)	
	30 mg	8B-S123-TBJ	3 mL (50/box)	
	60 mg	8B-S123-UBJ	3 mL (50/box)	
	100 mg	8B-S123-EBJ	3 mL (50/box)	
	100 mg	8B-S123-ECH	6 mL (30/box)	
	200 mg	8B-S123-FBJ	3 mL (50/box)	
	200 mg	8B-S123-FCH	6 mL (30/box)	
	500 mg	8B-S123-HBJ	3 mL (50/box)	
	500 mg	8B-S123-HCH	6 mL (30/box)	
Giga™ Tube				
	500 mg	8B-S123-HDG	12 mL (20/box)	
	1 g	8B-S123-JDG	12 mL (20/box)	
	1 g	8B-S123-JEG	20 mL (20/box)	
	2 g	8B-S123-KEG	20 mL (20/box)	
	5 g	8B-S123-LFF	60 mL (16/box)	
96-Well Plate				
	10 mg	8E-S123-AGB	2 Plates/Box	
	30 mg	8E-S123-TGB	2 Plates/Box	
	60 mg	8E-S123-UGB	2 Plates/Box	

GENERAL EXTRACTION PROTOCOL

Method written for a 30 mg/1 mL tube

1. Condition: 1 mL Methanol followed by 1 mL DI Water
2. Load: Pretreated sample
3. Wash: 1 mL 25 mM Ammonium acetate (pH 6-7) followed by 1 mL Methanol
4. Elute: 2x 500 µL 5 % Formic acid in Methanol or Acetonitrile

guarantee

If Strata-X SPE products do not perform as well or better than your current SPE product of similar phase, mass and size, return the product with comparative data within 45 days for a FULL REFUND.

Instant Method Development

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Strata-X Drug B

U.S. Patent No. 7,119,145

Strata-X-Drug B is a polymeric strong catiion-exchange SPE sorbent that is designed and quality controlled with Substance Abuse and Mental Health Services Administration (SAMHSA) regulations in mind.

3 EASY TO FOLLOW METHODS

Methods are written for 60 mg/6 mL Strata-X-Drug B; however they can be scaled to accommodate smaller or larger sample sizes and sorbent masses.

Opiates, 6-MAM, PCP, and Amphetamines*

1. Condition: No conditioning required
2. Load: Pre-treated urine sample
3. Wash 1: 2 mL of 100 mM Sodium acetate buffer (pH 5.0)
4. Wash 2: 2 mL Methanol
5. Dry: 10 minutes under full vaccum
6. Elute: 2 mL of Ethyl acetate/Isopropanol/Ammonium hydroxide (70:20:10)

Cocaine Metabolites

1. Condition: No conditioning required
2. Load: Pre-treated urine sample
3. Wash 1: 2 mL of 0.1 N Hydrochloric acid
4. Wash 2: 2 mL Methanol
5. Dry: 10 minutes under full vacuum
6. Elute: 2 mL of Ethyl acetate/Isopropanol/Ammonium hydroxide (70:20:10)

* Opiates, 6-MAM, PCP, and Amphetamines can be extracted simultaneously or separately using the same SPE methodology.

Marijuana Metabolites

1. Condition: No conditioning required
2. Load: Pre-treated urine sample
3. Wash 1: 2 mL of 100 mM Sodium acetate buffer (pH 5.0)
4. Wash 2: 2 mL of Acetonitrile/100 mM Sodium acetate buffer (pH 5.0) (30:70)
5. Dry: 15 minutes under full vacuum
6. Elute: 2 mL of Ethyl acetate/Isopropanol (85:15)

STRATA-X DRUG B

Ordering Information

Format	Sorbent Mass	Part Number	Unit	Price
Tube				
	10 mg	8B-S128-AAK	1 mL (100/box)	
	10 mg	8L-S128-AAK†	1 mL (100/box)	
	30 mg	8B-S128-TAK	1 mL (100/box)	
	30 mg	8L-S128-TAK†	1 mL (100/box)	
	30 mg	8B-S128-TBJ	3 mL (50/box)	
	60 mg	8B-S128-UBJ	3 mL (50/box)	
	60 mg	8B-S128-UCH	6 mL (30/box)	
	60 mg	8B-S128-UCL	6 mL (200/box)	
Giga™ Tube				
	100 mg	8B-S128-EDG	12 mL (20/box)	
96-Well Plate				
	10 mg	8E-S128-AGB	2 Plates/box	
	30 mg	8E-S128-TGB	2 Plates/box	
	60 mg	8E-S128-UGB	2 Plates/box	

† Tab-less tube

guarantee

If Strata-X SPE products do not perform as well or better than your current SPE product of similar phase, mass and size, return the product with comparative data within 45 days for a FULL REFUND.

Instant Method Development

Create your Own SPE Method in under 1 minute!

www.phenomenex.com/Tools/SPEMethodDevelopment

Phree

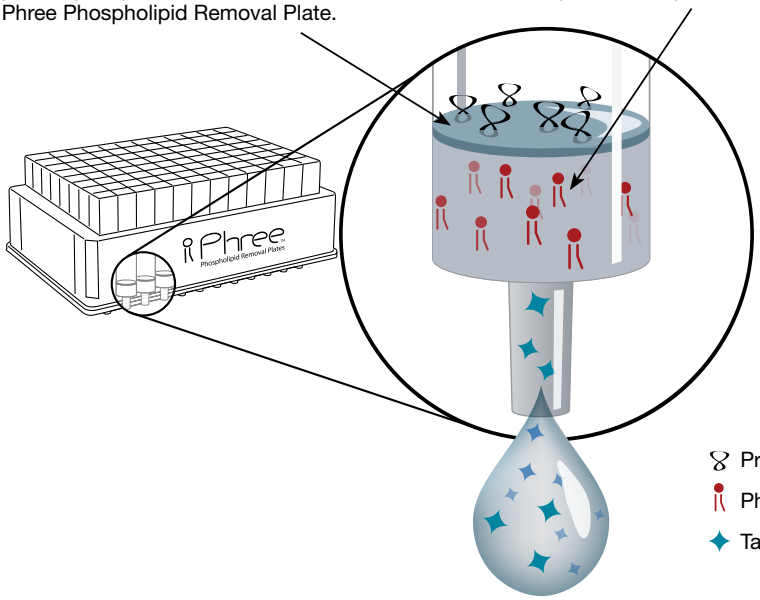
Phree is a high-throughput solution for removing all classes of phospholipids to maximize sensitivity and column lifetime.

Remove Proteins

Solvent Shielding Technology™ prevents dripping of organic solvent, allowing for protein precipitation within the wells of the Phree Phospholipid Removal Plate.

Eliminate Phospholipids

The Phree sorbent selectively removes phospholipids from precipitated plasma samples.



No Method Development

One method for acids, bases, and neutrals

PHREE

Ordering Information

Part No.	Description	Unit	Price
8E-S133-TGB	Phree Phospholipid Removal 96-Well Plates	2/box	
Collection Plates (deep well, polypropylene)			
AH0-7192	Strata® 96-Well Collection Plate 350 µL/well	50/pk	
AH0-7193	Strata 96-Well Collection Plate 1 mL/well	50/pk	
AH0-7194	Strata 96-Well Collection Plate 2 mL/well	50/pk	
AH0-8635	Strata 96-Well Collection Plate, 2 mL Square/Round-Conical	50/pk	
AH0-8636	Strata 96-Well Collection Plate, 2 mL Round/Round, 8 mm	50/pk	
AH0-7279	Strata 96-Well Collection Plate, 1 mL/well Round, 7 mm	50/pk	
Sealing Mats			
AH0-8597	Sealing Mats, Pierceable, 96-Square Well, Silicone	50/pk	
AH0-8598	Sealing Mats, Pre-Slit, 96-Square Well, Silicone	50/pk	
AH0-8631	Sealing Mats, Pierceable, 96-Round Well 7 mm, Silicone	50/pk	
AH0-8632	Sealing Mats, Pre-Slit, 96-Round Well 7 mm, Silicone	50/pk	
AH0-8633	Sealing Mats, Pierceable, 96-Round Well 8 mm, Silicone	50/pk	
AH0-8634	Sealing Mats, Pre-Slit, 96-Round Well 8 mm, Silicone	50/pk	
AH0-7362	Sealing Tape Pad	10/pk	
Vacuum Manifold			
AH0-8950	Strata 96-Well Plate Manifold, Universal with Vacuum Gauge	ea	

guarantee

If Phree Phospholipid Removal Plates do not perform as well or better than your current phospholipid removal plate, return the product with comparative data within 45 days for a FULL REFUND.

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An Analytical Support Laboratory

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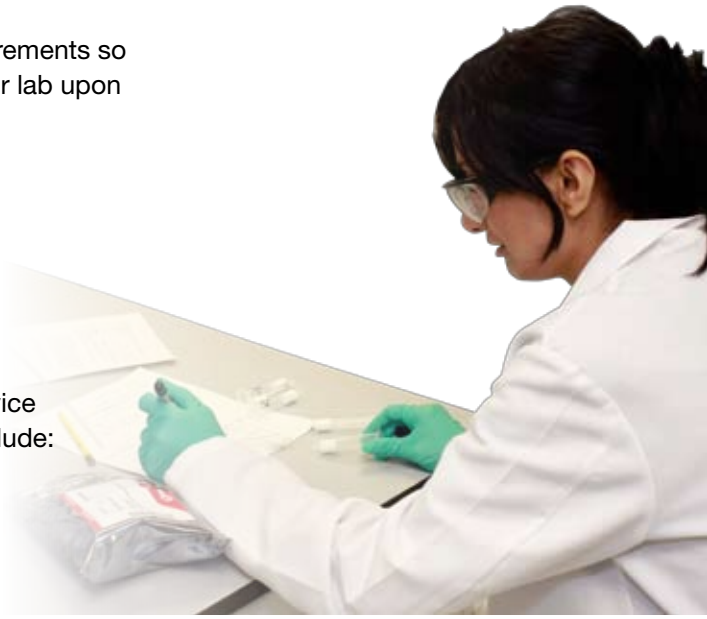
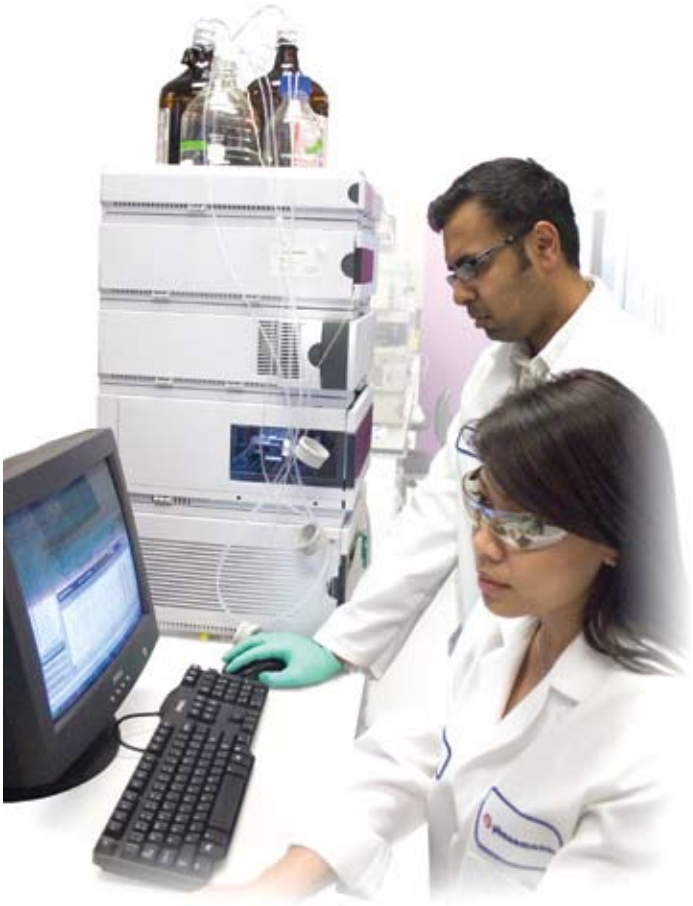
Email: **phenologix@phenomenex.com**
or
Visit: **www.phenomenex.com/Phenologix**



HOW CAN WE BE OF SERVICE?

PhenoLogix worldwide technical teams are here to provide full service method support and training for you and your lab. Our services include:

- Method Improvement and Optimization
- New Method Development
- Validation and Pre-validation Services
- On-Site Training and Consulting



PARTIAL LIST OF RESOURCES USED IN THE PHENOLOGIX LAB

- Agilent®, Shimadzu, ACQUITY® and JASCO HPLC and UHPLC systems
- API 3000™ LC/MS/MS
- API 4000™ LC/MS/MS
- API 5000™ LC/MS/MS
- 4000 Q-TRAP® LC/MS/MS
- Waters® Micromass® Quattro™ MS
- Agilent and Shimadzu GC/MS systems
- Gilson® and PerkinElmer® liquid handlers

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