



Faster. Easier. Reliable.

SLE Simplified.

PATENT PENDING

Revision: 0

PHEN-RUO-00132

Need Ultra-Low Detection Limits?

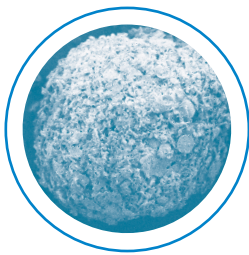
Move Over Biotage® ISOLUTE® SLE+. Meet New Novum PRO.



Your Diatomaceous Earth SLE Product Could Use Some Improvements

The material inside your SLE product consists of diatomaceous earth (fossilized diatoms) that is extremely old and can make extractions unreliable.

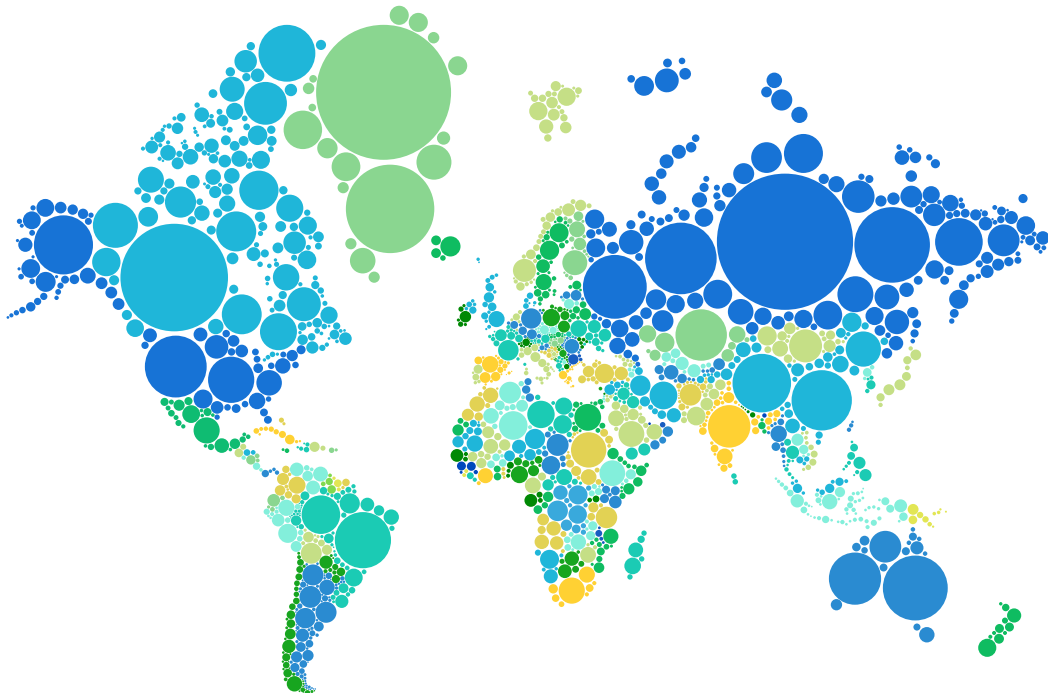
All diatoms are unique, making each of your traditional SLE products unique and therefore inconsistent.



1000x zoom of salt water
vs. fresh water diatomaceous
earth sorbents



Diatomaceous earth can be found in various mines across the world. Do you know where each batch of your SLE media comes from?



Redefine Your SLE with Novum™ Simplified Liquid Extraction

Novum SLE (patent pending) eliminates the questions associated with diatomaceous earth. As a lab manufactured sorbent, you can expect reliable, more consistent results.

And Now Introducing Novum PRO SLE

The same reliable SLE sorbent with our new manufacturing capabilities to help you achieve low limits of detection with clean, high-throughput extractions.

Proudly
manufactured at
Phenomenex
Headquarters in
Torrance, CA USA



A Simplified Procedure

Novum™ SLE follows a simple 3 step procedure, allowing up to 96 samples to be processed in < 15 minutes. If further time savings are necessary, Novum SLE can be easily automated for rapid, hands free sample cleanup.

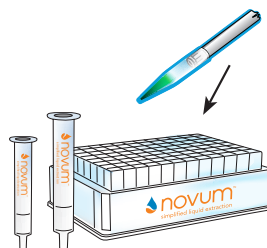
Novum Simplified Liquid Extraction (SLE)

Estimated Time Required = **<15 minutes**



1. LOAD

Dilute sample 1:1 with buffer or water and load onto Novum SLE sorbent using 2–15 seconds of vacuum.



Optimized frit system provides a consistent flow of sample into the Novum SLE sorbent

2. WAIT

For 5 minutes.



3. ELUTE

Apply elution solvent and allow to elute via gravity. Complete elution with 10 seconds of vacuum.



Applying vacuum can reduce the amount of time required for elution without sacrificing cleanliness

See page 5 to learn more about the benefits of vacuum or positive pressure manifold processing.

Visit www.phenomenex.com/Novum for buffer and elution solvent recommendations, technical notes, demonstration videos, and more!

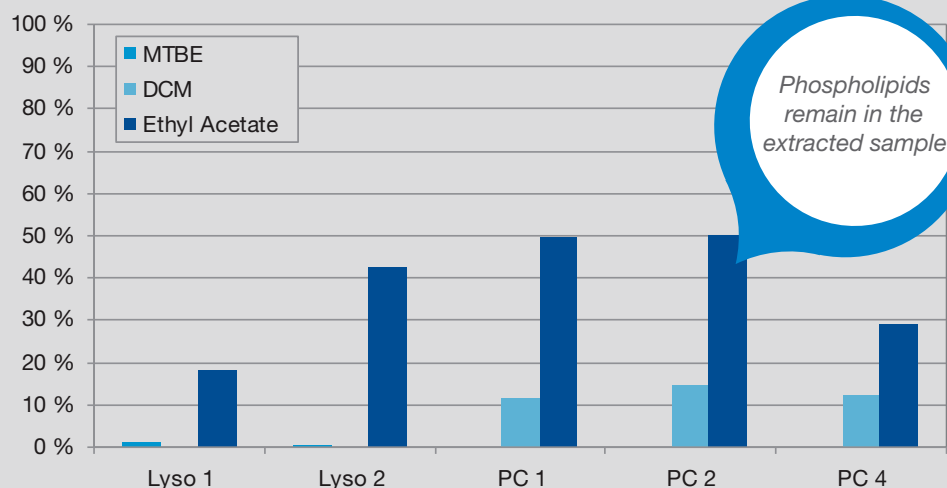
A Cleaner Extract for Improved LC-MS/MS Analysis

Phospholipids are present in all bioanalytical samples and can cause a variety of issues in LC-MS/MS analysis including ion suppression, reduced column lifetime, and reduced mass spec sensitivity.

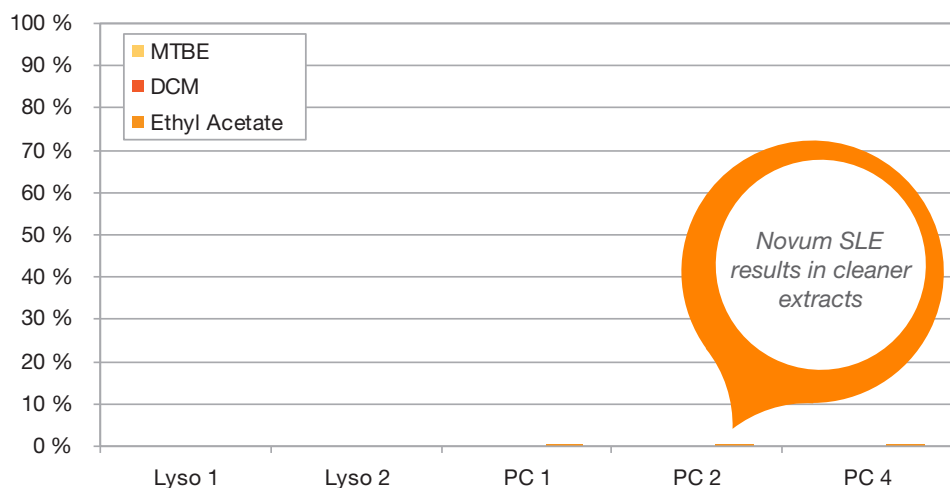
Have you monitored the cleanup ability of your SLE product?

Phospholipid Breakthrough Using Various Extraction Solvents

Biotage® ISOLUTE® SLE+* (diatomaceous earth)



Novum SLE (synthetic SLE sorbent)



- Lyso 1: 1-Palmitoyl-2-OH-sn-glycero-phosphocholine (m/z 496-184)
- Lyso 2: 1-Oleoyl-2-OH-sn-glycero-phosphocholine (m/z 522-184)
- PC 1: 1-Palmitoyl-2-Oleoyl-sn-glycero-phosphocholine (m/z 761-184)
- PC 2: 1-Stearoyl-2-Lindoleoyl-sn-glycero-phosphocholine (m/z 787-184)
- PC 4: 1-Oleoyl-2-Lindoleoyl-sn-glycero-phosphocholine (m/z 784-184)

Extraction Method

1. Load diluted plasma (diluted 1:1 with water) onto a SLE 96-Well Plate, apply vacuum for 2-5 seconds.
2. Allow sample to soak into the SLE sorbent for 5 minutes.
3. Elute with ethyl acetate.

Plasma extractions were performed using Novum SLE MAX and Biotage® ISOLUTE® SLE+* 400 µL plates. The recommended protocol provided with each product was followed. Comparative separations may not be representative of all applications.

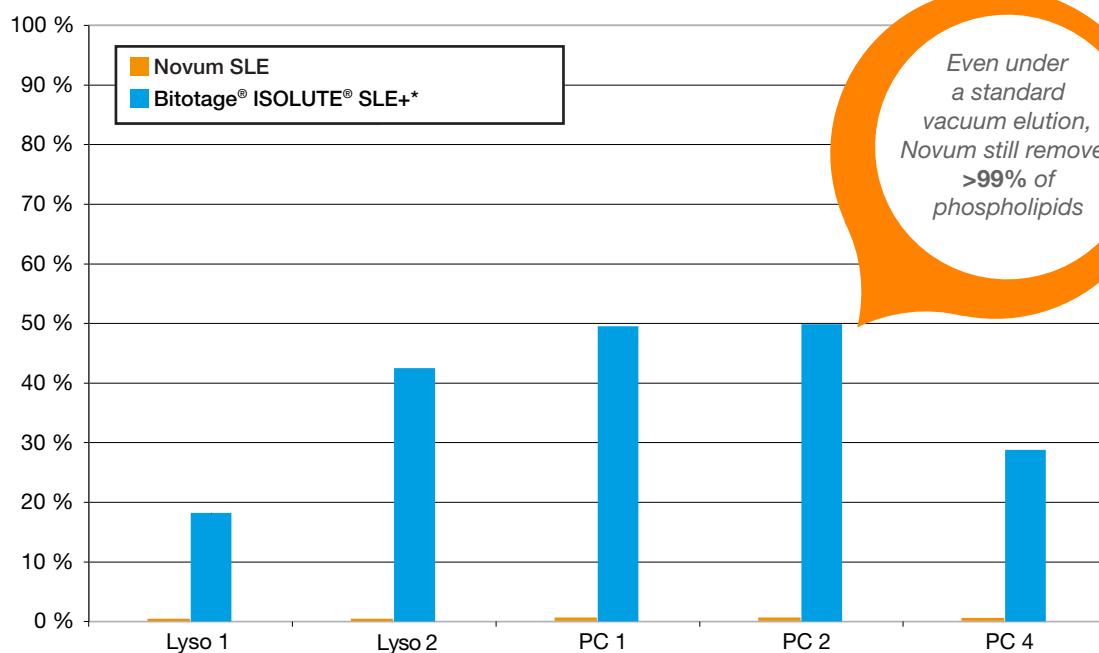
Avoid the Risks Associated with Diatomaceous Earth SLE

Diatomaceous earth sorbents can have inconsistent aqueous holding capacities, which ultimately results in sample breakthrough before or during the final vacuum or positive pressure step. This will yield unwanted phospholipids in sample extract as seen below.

Novum SLE will not allow water and phospholipids to breakthrough the sorbent during a standard vacuum or positive pressure step due to the consistent aqueous holding capacity, allowing you to maximize your extraction without negatively affecting your clean-up.

Phospholipid Breakthrough Using 5" Hg Vacuum

Novum SLE vs. Biotage® ISOLUTE® SLE+*



Even under a standard vacuum elution, Novum still removes >99% of phospholipids

- Lyso 1: 1-Palmitoyl-2-OH-sn-glycero-phosphocholine (m/z 496-184)
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- PC 1: 1-Palmitoyl-2-Oleoyl-sn-glycero-phosphocholine (m/z 761-184)
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Extraction Method

1. Load diluted plasma (diluted 1:1 with water) onto a SLE 96-Well Plate, apply vacuum for 2-5 seconds.
2. Allow sample to soak into the SLE sorbent for 5 minutes.
3. Elute with ethyl acetate.



Positive Pressure Manifold for Streamlined Sample Preparation

- Pneumatic Handling
- Consistent Flow Rates
- Safe and Easy-to-Use
- Go to www.phenomenex.com/Presston to learn more

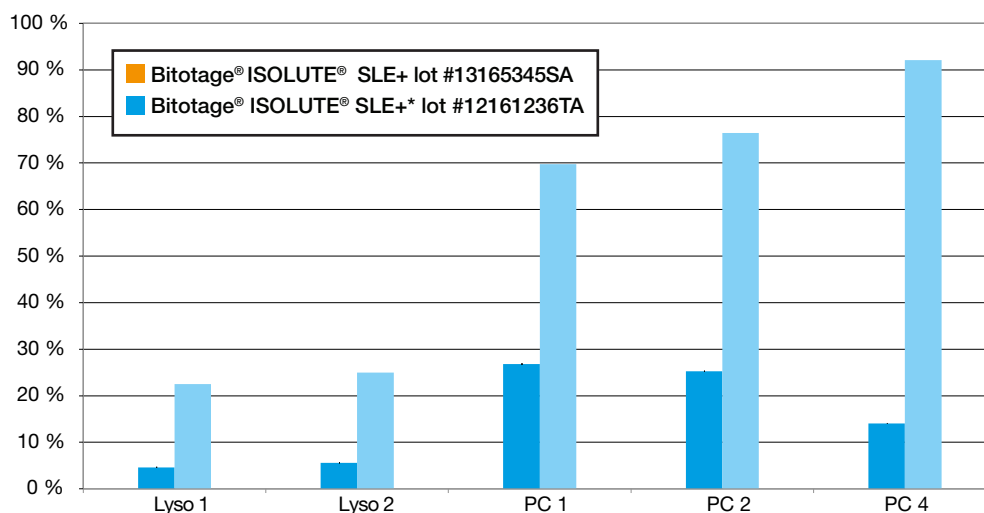
Plasma extractions were performed using Novum SLE MAX and Biotage® ISOLUTE® SLE+* 400 µL plates. The recommended protocol provided with each product was followed. Comparative separations may not be representative of all applications.

More Reliable Clean-up, Lot-to-Lot

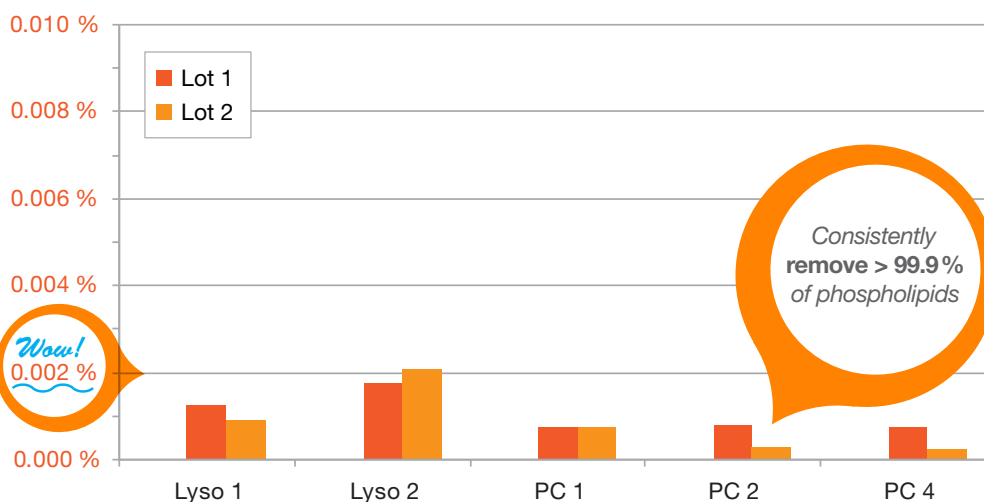
As a naturally occurring product, the composition of diatomaceous earth used in traditional SLE products will vary. This results in inconsistency with the aqueous holding capacity which leads to incomplete cleanup of phospholipids.

Novum SLE is a lab manufactured sorbent, ensuring that the aqueous holding capacity is uniform leading to cleanup and recoveries that are consistent from lot-to-lot.

Biotage® ISOLUTE® SLE+* Lot-to-Lot Phospholipid Breakthrough



Novum SLE Lot-to-Lot Phospholipid Breakthrough



- Lyso 1: 1-Palmitoyl-2-OH-sn-glycero-phosphocholine (m/z 496-184)
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- PC 1: 1-Palmitoyl-2-Oleoyl-sn-glycero-phosphocholine (m/z 761-184)
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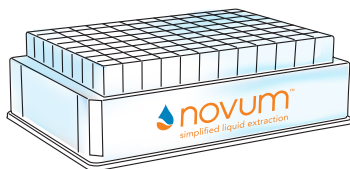
- Extraction Method**
1. Load diluted plasma (diluted 1:1 with water) onto a SLE 96-Well Plate, apply vacuum for 2-5 seconds.
 2. Allow sample to soak into the SLE sorbent for 5 minutes.
 3. Elute with ethyl acetate.

Plasma extractions were performed using Novum SLE MINI and Biotage® ISOLUTE® SLE+* 200µL plates. The recommended protocol provided with each product was followed. Comparative separations may not be representative of all applications.

Get Down to the Lowest Extraction Levels with Novum PRO SLE

Offers the same reliable synthetic sorbent as Novum with additional clean manufacturing steps to reach low levels of detection for sensitive MS applications, with the same quality reproducibility for high-throughput samples.

- Specific manufacture capabilities to improve matrix factor response and reduce noisy baselines for low level testing of biological samples
- API 6500+ fit for purpose testing to ensure clean baseline with each batch
- Available in both MINI and MAX 96-well plate formats for high-throughput applications



Simple Method with Easy Transferability

- Load
- Wait
- Elute

Easy Method Development

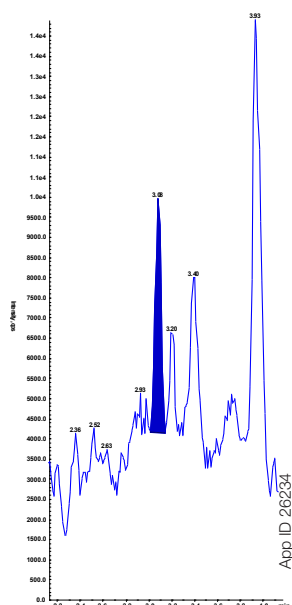
- Screen elution solvents in less time
- Easily determine the best solvent to use for clean backgrounds

Low Level Detection

- Applications that require low levels of detection and sensitivity can now be met by Novum PRO SLE

Equivalent reliability to traditional synthetic Novum SLE

5 pg/mL (LLOQ) Estriol (E3)



View more applications and information
about Novum PRO SLE at
www.phenomenex.com/NovumPRO

Low Level Hormones from Plasma

Sensitive analysis requirements require clean MS backgrounds and precise low levels of analyte extractions. Novum PRO SLE makes this possible with LLOQs of 5-10 pg/mL for multiple estrogens and testosterone from plasma.

With some diatomaceous earth SLE sorbents, background interferences can make peaks undetectable but with Novum PRO, recoveries are high with low limits of detection on a sensitive MS.

Estrogen Panel from Plasma

Novum PRO SLE Protocol

Pretreatment: 200 µL spiked plasma and 200 µL 50 mM Sodium phosphate buffer, pH unadjusted

Load: Pretreated sample onto Novum PRO MAX SLE (8E-S539-5GA), wait 5 minutes

Elute: 2x 900 µL Hexane/Ethyl acetate (1:3)

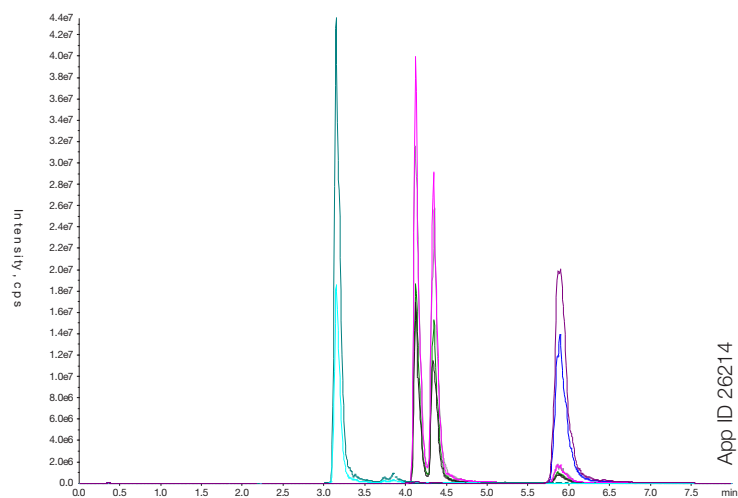
Dry: Down under Nitrogen

Reconstitute: 50 µL Dansyl chloride/Sodium bicarbonate (1:1), incubate at 60 °C for 10 minutes

Estrogen Panel Recovery on Novum PRO SLE

Analyte	%Recovery	%CV	LLOQ	Retention Time
Estrone (E1)	111	7	10 pg/mL	5.90
beta-Estadiol (E2)	92	7	10 pg/mL	4.35
Estriol (E3)	99	1	5 pg/mL	3.15

Representative Chromatogram of Estrogen Panel at 2 ng/mL



Conditions for all samples:

Columns: Kinetex® 1.7 µm Biphenyl

Dimensions: 50 x 2.1 mm

Part No.: 00B-4628-AN

Mobile Phase: A: 0.1% Formic acid in Water

B: 0.1% Formic acid in Methanol

Gradient	Time (min)	% B
	0	80
	1	80
	2	90
	3	95
	6	95
	6.1	80
	8	80

Flow Rate: 0.4 mL/min

Temperature: Ambient

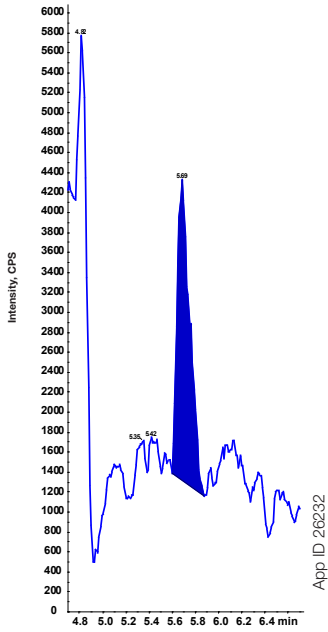
Injection: 10 µL

Detection:

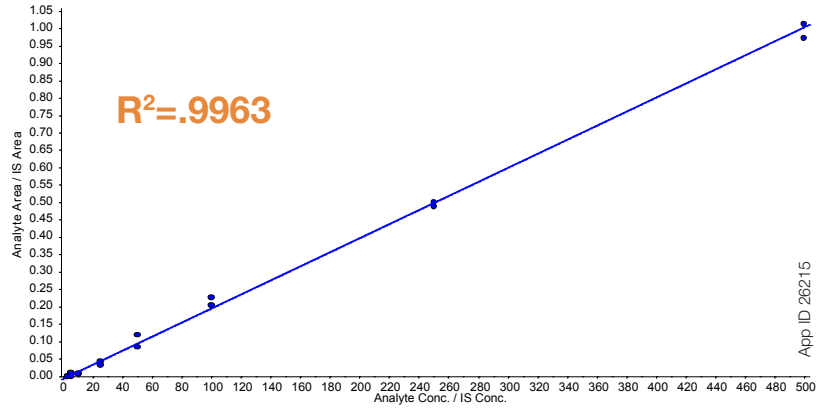


Estrogen Panel from Plasma (cont'd)

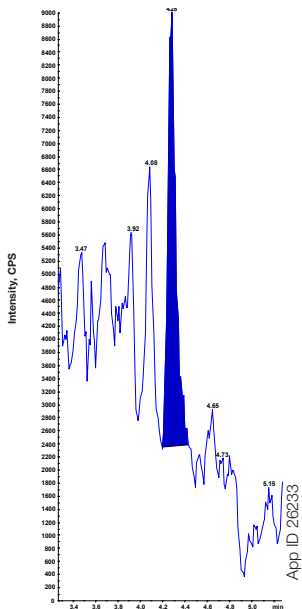
10 pg/mL (LLOQ) Estrone (E1)



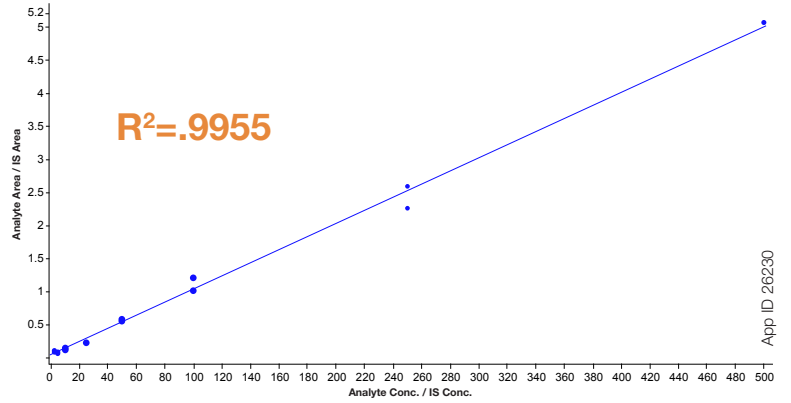
Calibration Curve of E1 from 5 to 500 pg/mL



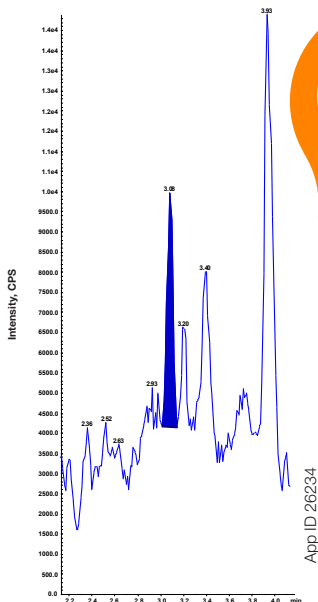
10 pg/mL (LLOQ) beta-Estradiol



beta-E2 Calibration Curve

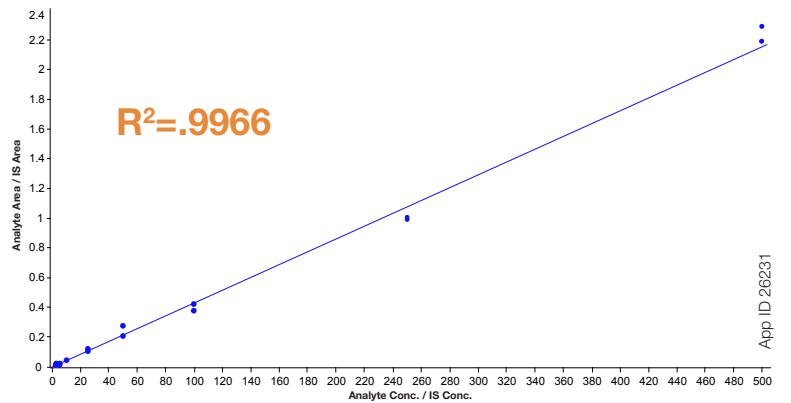


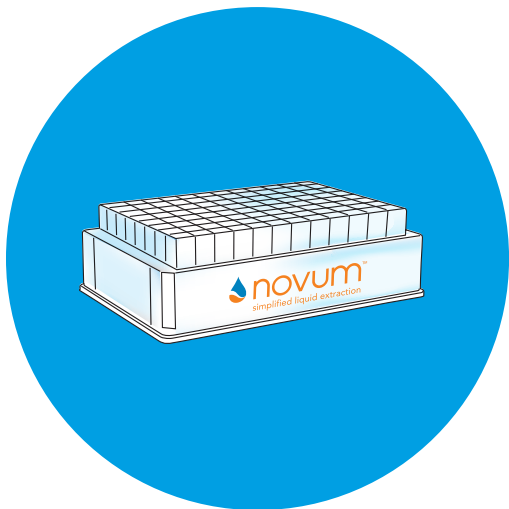
5 pg/mL (LLOQ) Estriol (E3)



Move over
Biotage! New Novum
PRO is here!

Calibration Curve of E3 from 2.5 to 500 pg/mL





Testosterone Panel from Plasma

Novum PRO SLE Protocol

Pretreatment: 200 μ L spiked plasma and 200 μ L 50 mM Sodium phosphate buffer, pH unadjusted
Load: Pretreated sample onto Novum PRO MAX SLE (8E-S539-5GA), wait 5 minutes
Elute: 2x 900 μ L Hexane/Ethyl acetate (1:3)
Dry: Down under Nitrogen
Reconstitute: 50 μ L Water/Methanol (80:20)

Signal-to-Noise Ratio at Diverse Concentrations

Conc.	S/N
10 pg/mL	9.42
25 pg/mL	25.93
50 pg/mL	33.17
250 pg/mL	77.59
500 pg/mL	202.07
500 pg/mL	138.62



Conditions for all samples:

Columns: Kinetex[®] 1.7 μ m Biphenyl

Dimensions: 50 x 2.1 mm

Part No.: 00B-4628-AN

Mobile Phase: A: 0.1% Formic acid in Water
 B: 0.1% Formic acid in Methanol

Gradient:	Time (min)	% B
	0	60
	2	90
	3	95
	3.1	60
	5	60

Flow Rate: 0.4 mL/min

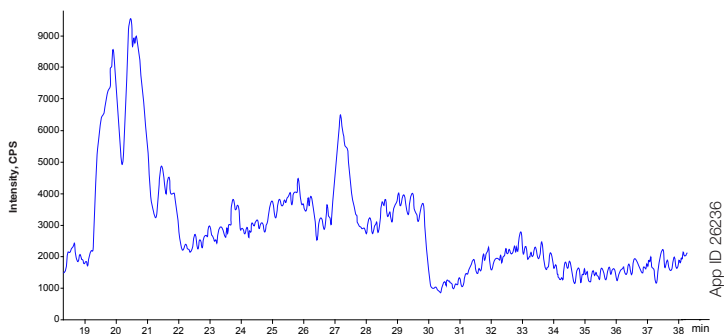
Temperature: Ambient

Injection: 10 μ L

Detection: SCIEX[®] 6500+ QTRAP[®] MS/MS

Sample: Testosterone

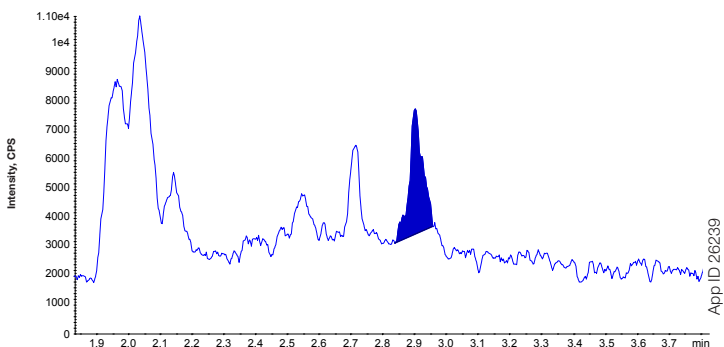
Plasma Blank



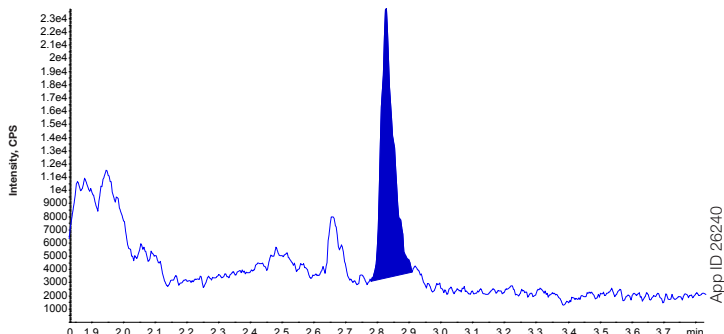
10 pg/mL (LLOQ) of Testosterone



20 pg/mL of Testosterone



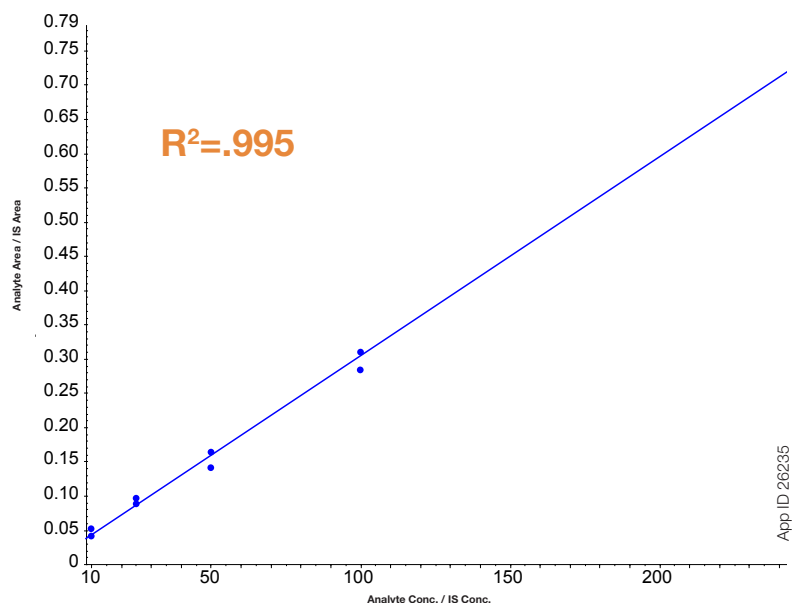
80 pg/mL Testosterone



Reach required LLOQ with Novum PRO SLE
 with no background interferences.

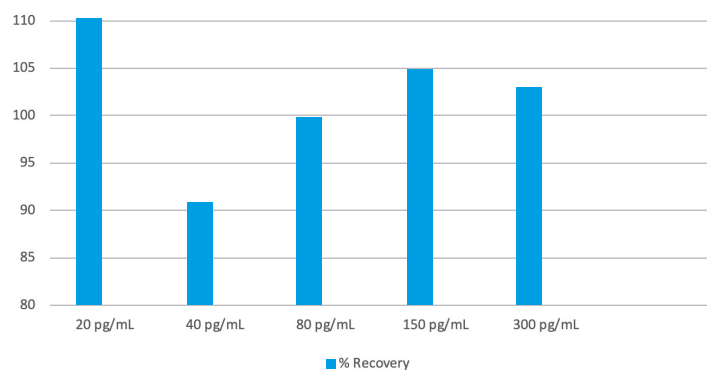
Testosterone Panel from Plasma (cont'd)

Calibration Curve of Testosterone from 10 to 300 pg/mL



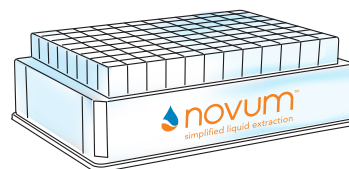
Good recoveries and low % CVs at diverse levels of concentration with clean-up using Novum PRO!

Testosterone Recovery and at Diverse Concentrations



Recovery Data

Testosterone	% Recovery	% CV
20 pg/mL	111	10
40 pg/mL	92	9
80 pg/mL	99	12
150 pg/mL	105	12
300 pg/mL	103	12



Have Questions?

chat now

Quotes, Methods, Tips... We're here to help

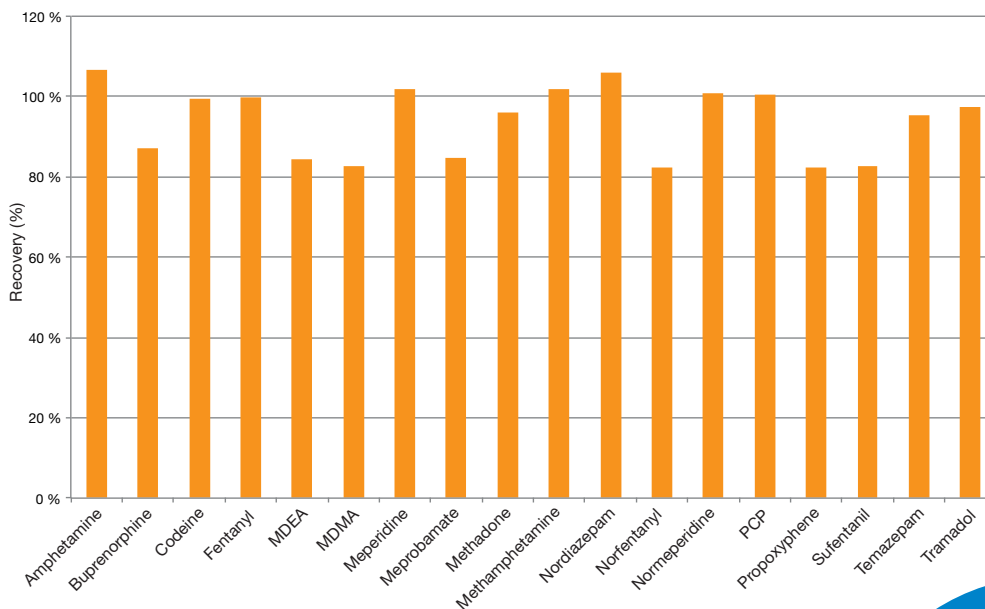
www.phenomenex.com/ChatNow

Faster Method Development

SLE products may be the single easiest method development product, making it super easy to screen for diverse extraction solvents. With Novum™ SLE, you can trust that results will be consistent with the correct extraction solvent.

For typical applications, Novum™ SLE provides excellent recovery and cleanup using ethyl acetate as an extraction solvent, significantly reducing your method development time.

Recovery of 18 Pain Management Drugs from Urine using a Single Extraction Method on Novum SLE



Analyte	% RSD
Amphetamine	3
Buprenorphine	5
Codeine	10
Fentanyl	6
MDEA	4
MDMA	4
Meperidine	9
Meprobamate	7
Methadone	2
Methamphetamine	12
Nordiazepam	1
Norfentanyl	3
Normeperidine	4
PCP	2
Propoxyphene	9
Sufentanil	11
Temazepam	2
Tramadol	9

A Simplified Procedure

Extraction Method

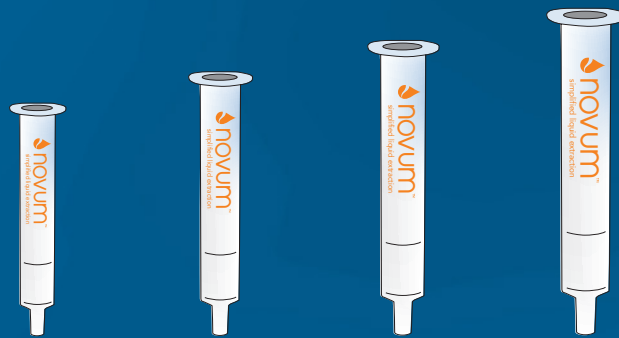
1. Load diluted urine (diluted 1:1 with 0.5 M Ammonium hydroxide) onto Novum SLE MAX 96-well plate, apply vacuum for 2-15 seconds
2. Allow sample to soak into Novum SLE sorbent for 5 minutes
3. Elute with ethyl acetate

For typical applications ethyl acetate provides the best balance of cleanup and recovery! But screening for multiple solvents is easy with Novum SLE.

A Variety of Formats to Fit Your Sample and Throughput Requirements

Tubes

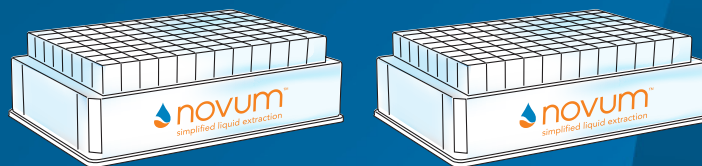
Process samples as small as 100 μL or as large as 1 mL using Novum SLE tubes. Ideal for all types of applications including Bioanalytical, Food Safety, and Environmental.



Novum SLE Tube	1 cc	3 cc	6 cc	12 cc
Maximum Sample Volume (before dilution)	100 μL	200 μL	500 μL	1 mL
Recommended Elution Volume	1.2 mL	1.8 mL	5 mL	10 mL

96-Well Plates

Process 96 samples at once in an easily automatable 96-well plate. Perfect for high-throughput applications



Novum SLE 96-Well Plate	MINI	MAX
Maximum Sample Volume (before dilution)	150 μL	200 μL
Recommended Elution Volume	1 mL	1.8 mL

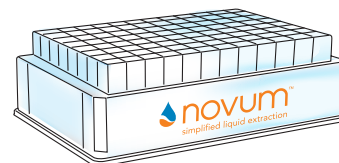
New Novum PRO 96-Well Plates

Made to reach low level extraction capabilities with new manufacturing processes and same 96-well plate formats as traditional Novum for high-throughput, reliable SLE clean-up.

Redefine Your SLE

Novum SLE 96-Well Plates

Part No.	Description	Unit
8E-S138-FGA	Novum SLE MINI 96-Well Plate	1/pk
8E-S138-5GA	Novum SLE MAX 96-Well Plate	1/pk
8E-S539-FGA	Novum PRO SLE MINI, 96-Well Plate	1/pk
8E-S539-5GA	Novum PRO SLE MAX, 96-Well Plate	1/pk



Accessories

Collection Plates (deep well, polypropylene)		Unit
AH0-7192	96-Well Collection Plate, 350 µL/well Conical	50/pk
AH0-7193	96-Well Collection Plate, 1 mL/well Conical	50/pk
AH1-7022	96-Well Collection Plate, 2 mL/well Conical	50/pk
AH0-8636	96-Well Collection Plate, 2 mL Round/Round, 8 mm	50/pk
AH1-7025	96-Well Collection Plate, 1 mL/well Round, 7 mm	50/pk
Sealing Mats		Unit
AH0-8597	Sealing Mats, Pierceable, 96-Square Well, Silicone	50/pk
AH0-8598	Sealing Mats, Pre-Slit, 96-Square Well, Silicone	50/pk
AH0-7362	Sealing Tape Pad	10/pk
Vacuum and Positive Pressure Manifolds		Unit
AH0-8950	96-Well Plate Manifold, Universal with Vacuum Gauge	ea
VM12	12-Position Vacuum Manifold Set	ea
VM24	24-Position Vacuum Manifold Set	ea
AH1-7033	Presston 1000 Positive Pressure Manifold, 96-Well Plate	ea

Phenomenex warrants the Presston 1000 Positive Pressure Manifold against defects in materials and workmanship under normal installation, use, and maintenance for a period of 12 months following delivery. Please visit www.phenomenex.com/presstonwarranty for complete warranty information.

BE-HAPPY™
guarantee

Your happiness is our mission. Take 45 days to try our products. If you are not happy, we'll make it right.

www.phenomenex.com/behappy

Novum SLE Tubes

Part No.	Description	Unit
8B-S138-FAK	Novum SLE 1 cc tubes	100/pk
8B-S138-5BJ	Novum SLE 3 cc tubes	50/pk
8B-S138-JCH	Novum SLE 6 cc tubes	30/pk
8B-S138-KDG	Novum SLE 12 cc tubes	20/pk



Tip

For more information about Phenomenex sample preparation products, visit www.phenomenex.com/sampleprepinfo

Terms and Conditions

Subject to Phenomenex Standard Terms and Conditions, which may be viewed at www.phenomenex.com/TermsAndConditions.

Trademarks

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Disclaimer

Comparative separations may not be representative of all applications.

Novum is patent pending. Phenomenex is in no way affiliated with Biotage AB.

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Faster. Easier. Reliable.

SLE Simplified.

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