Product Guide

Micro LC Columns and Traps

Enhance your Micro LC Applications with New Column Dimensions and Versatile Selectivities

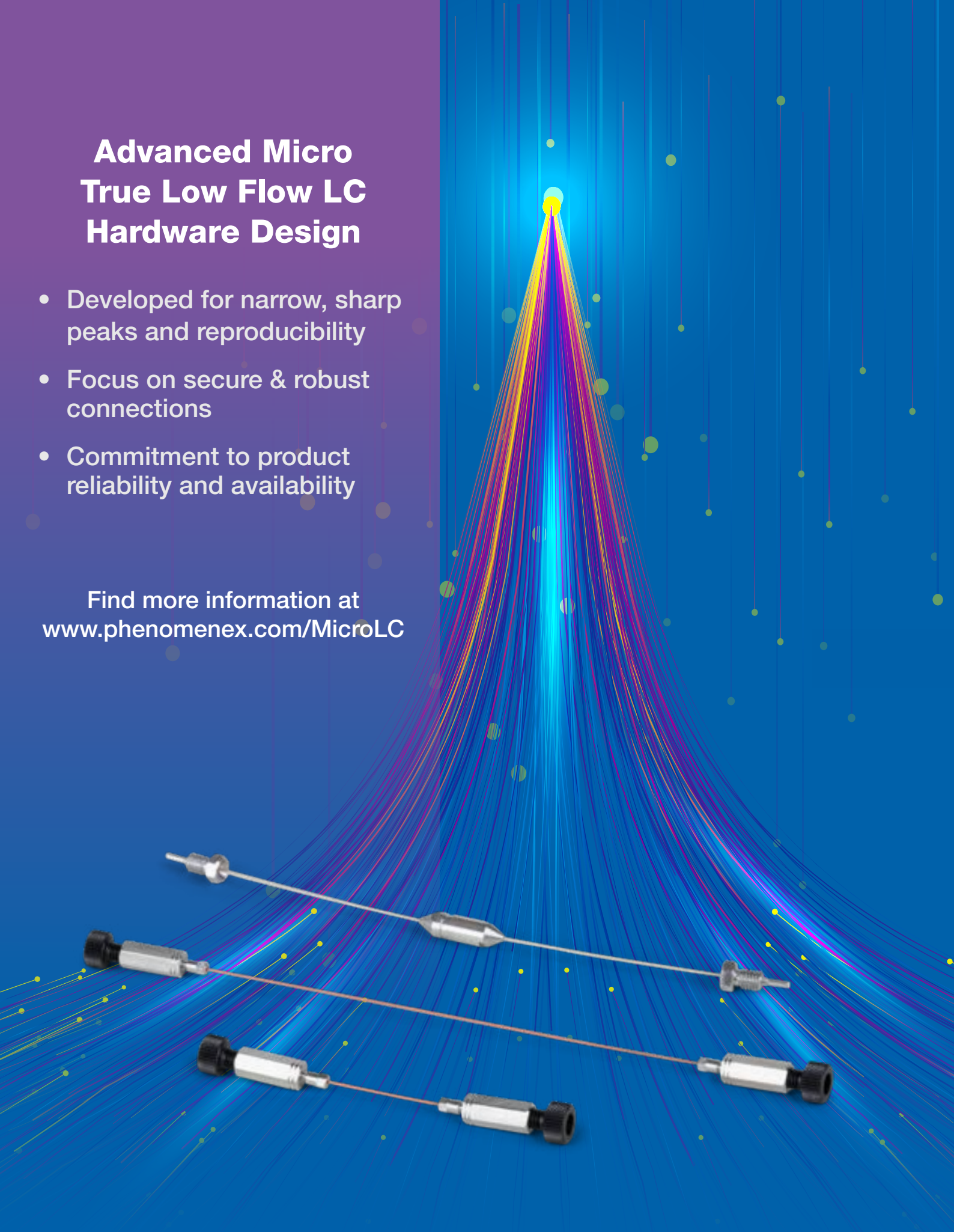
- Kinetex™
- Luna™ Omega
- Synergi™
- Gemini™
- Luna

U/HPLC Micro Traps with Integrated Fittings

Advanced Micro True Low Flow LC Hardware Design

- Developed for narrow, sharp peaks and reproducibility
- Focus on secure & robust connections
- Commitment to product reliability and availability

Find more information at www.phenomenex.com/MicroLC



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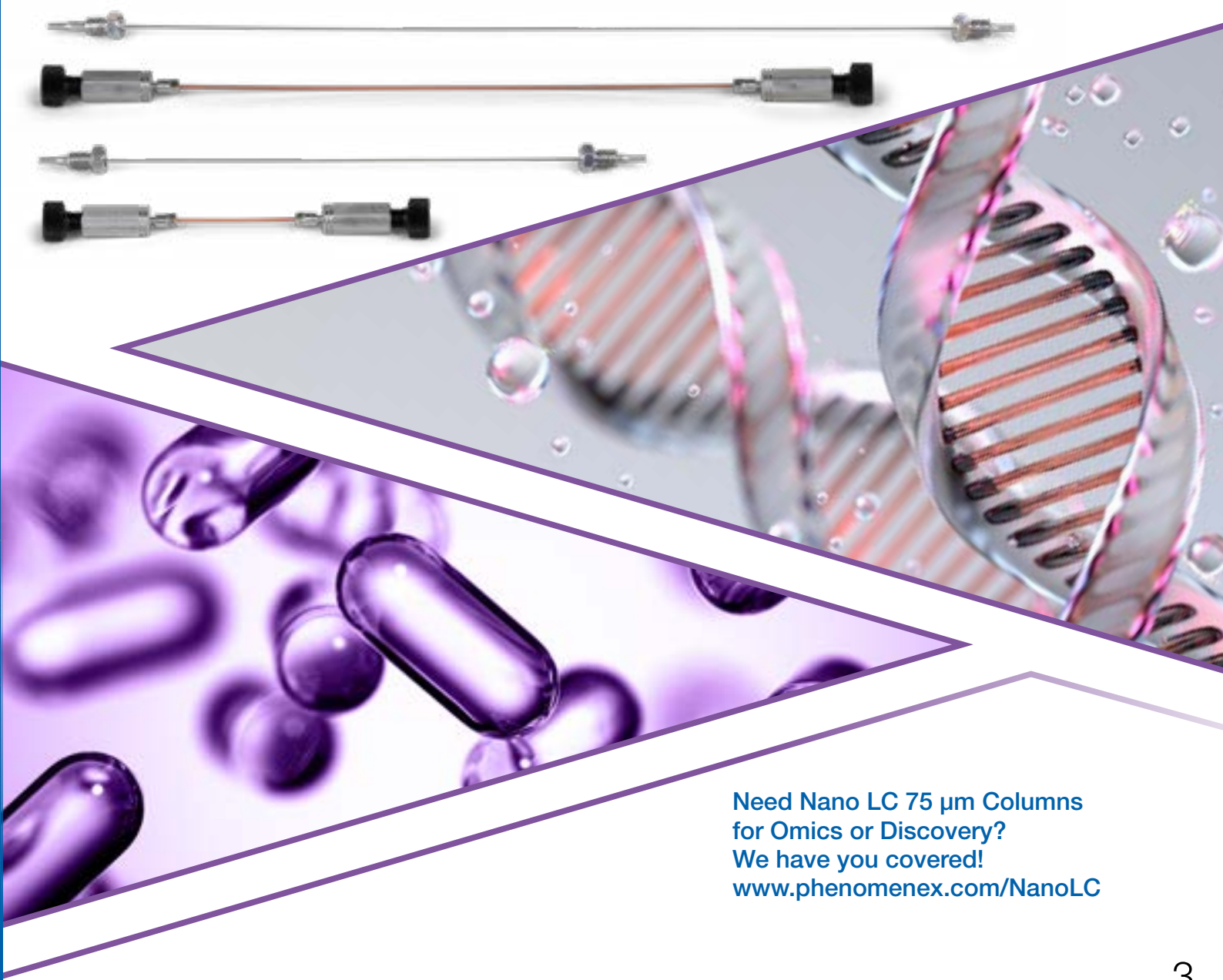
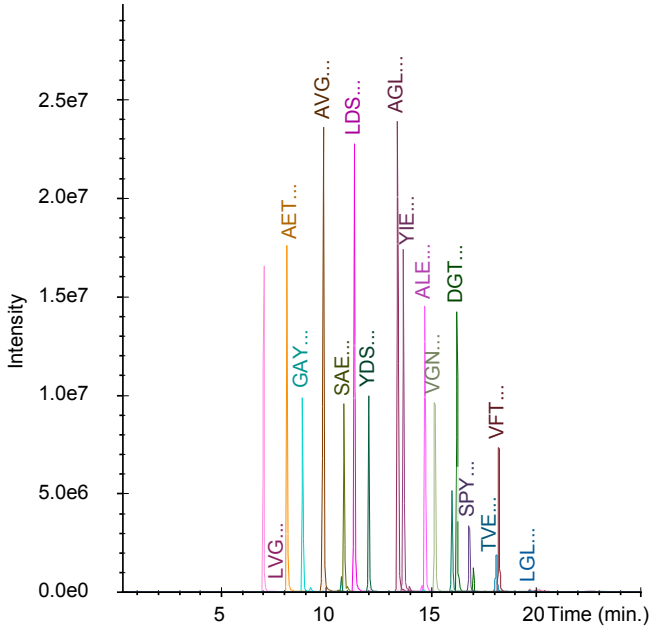


Increase Sensitivity with New .15 mm Micro Columns

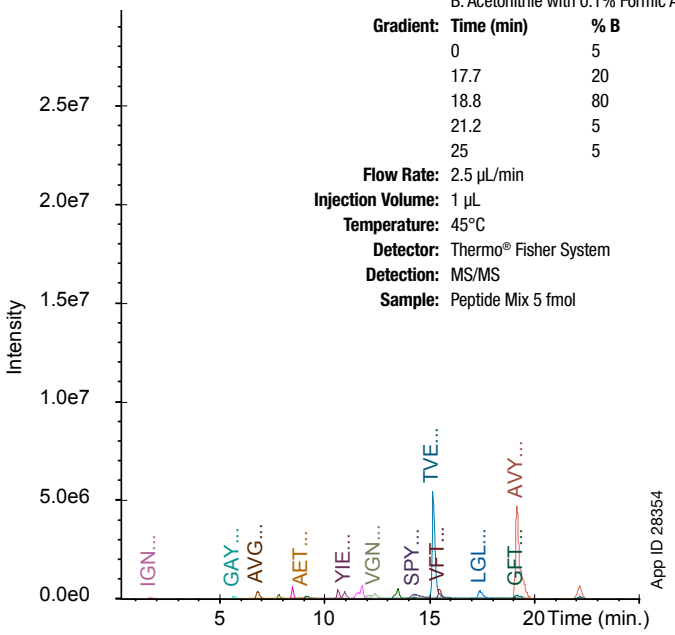
New 0.15 mm ID low-flow columns for true low flow peptide mapping applications show increased sensitivity and efficiency with reduced sample and solvent consumption.

Peptide Sensitivity Comparison

0.15 mm ID



0.3 mm ID



Micro LC Conditions

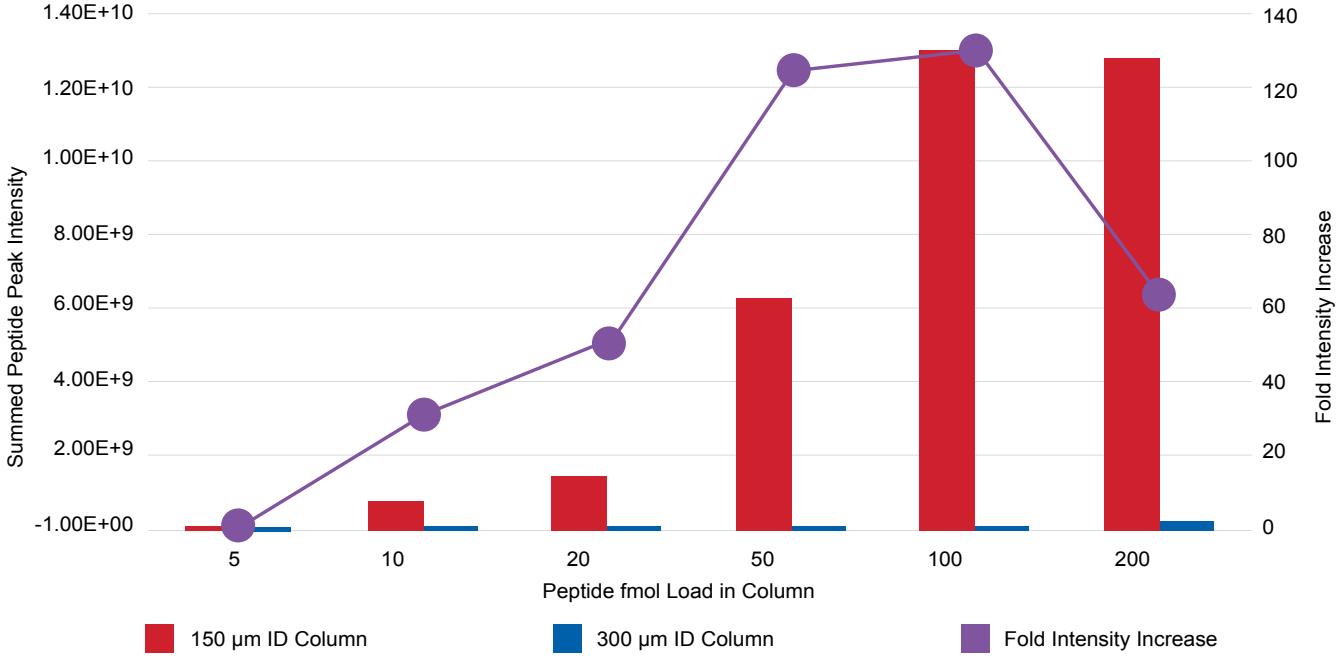
Columns: Kinetex™ x 2.6 µm XB-C18
Dimension: 150 x .15 mm
Part No.: 00F-4496-AG
Mobile Phase: A: Water with 0.1% Formic Acid
B: Acetonitrile with 0.1% Formic Acid

Gradient:

Time (min)	% B
0	5
17.7	20
18.8	80
21.2	5
25	5

Flow Rate: 2.5 µL/min
Injection Volume: 1 µL
Temperature: 45°C
Detector: Thermo® Fisher System
Detection: MS/MS
Sample: Peptide Mix 5 fmol

Peak peptide ion intensities at 5 to 200 fmol of peptide on a 150 (red) and a 300 (blue) µm ID column and intensity fold increase (purple)



Astra Zeneca

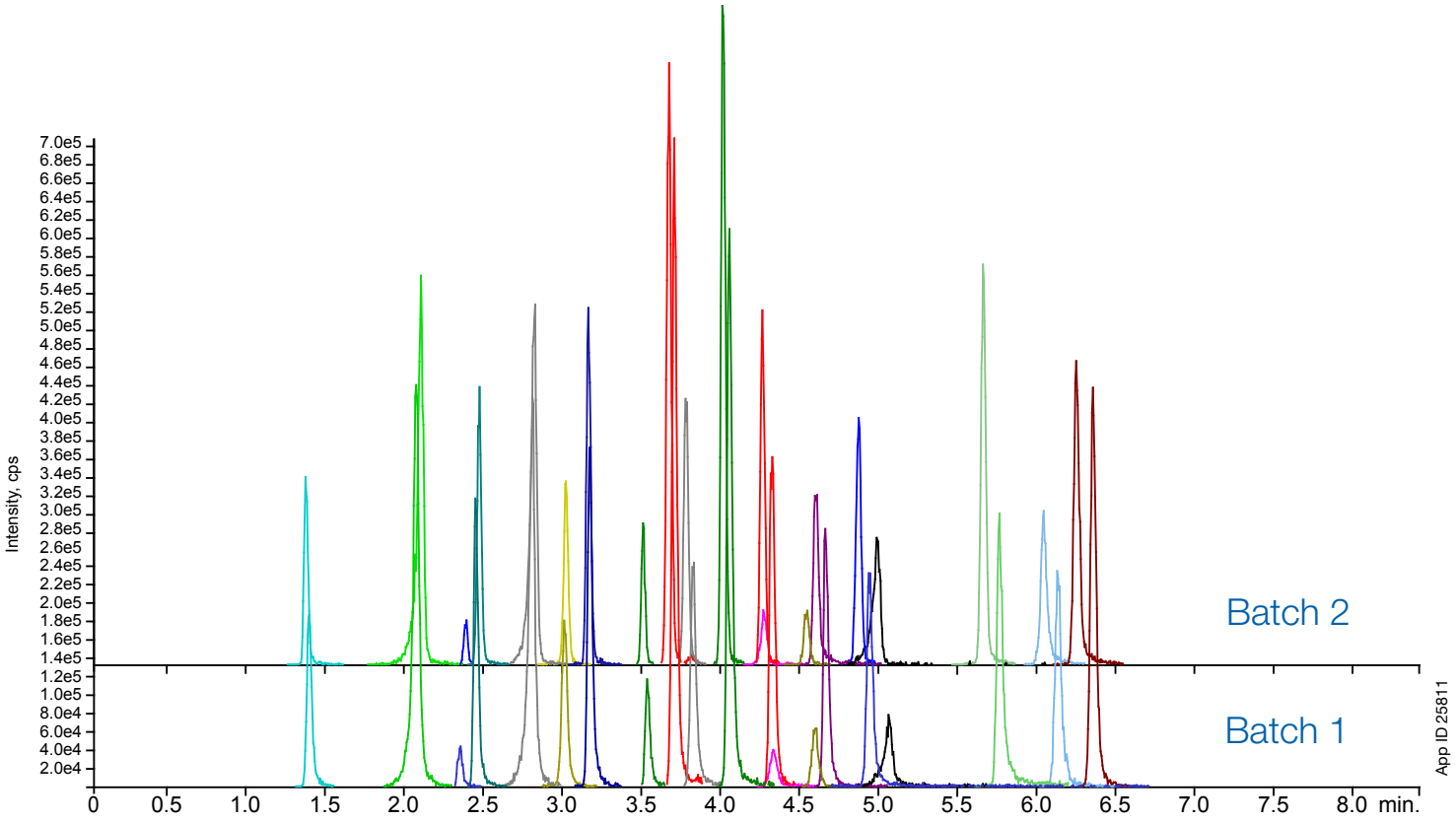
"The new 150 x 0.15 mm capillary LC column (Kinetex 2.6 µm C18 100 Å) delivers remarkable robustness and high separation performance under demanding conditions for high-sensitivity biomarker analysis. Its female connectors on both ends ensure seamless compatibility, making it easy to integrate into any low flow LC-MS system. Overall, this capillary column combines durability, efficiency and versatility and has become our standard column for high sensitivity applications."

To learn more about applications and benefits of using our new .15 mm micro low flow columns, go to www.phenomenex.com/microlc

Diverse Selectivity and Improved Performance

Our micro columns are manufactured with hardware and surface chemistries that are designed to be consistent analytical tools for your analysis. They undergo extensive quality testing to ensure dependability and reproducibility to bring confidence to your application.

Micro LC Kinetex™ Batch-to-Batch: 20 Stable-Isotope-Labeled (SIL) Peptides

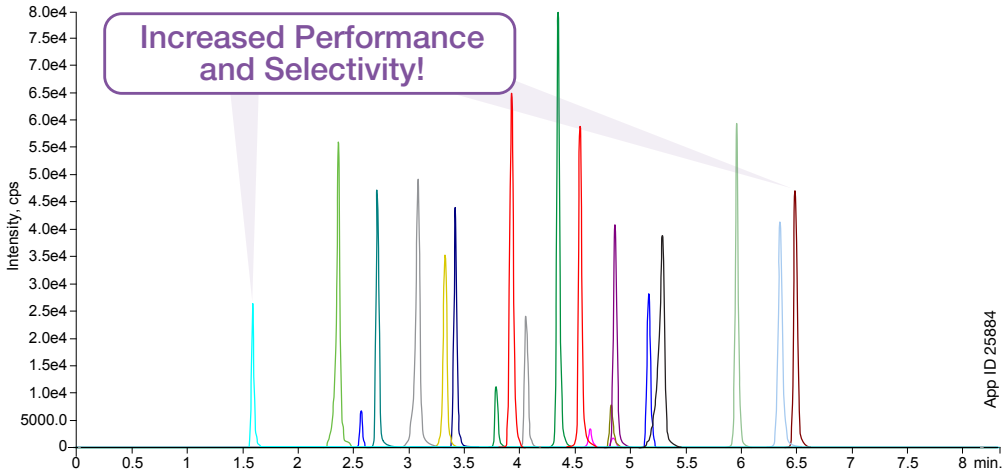


This comparison was generated using a sample of 20 stable-isotope-labeled (SIL) peptides under general reversed phase mobile phase conditions. The system used for this example was an Ekspert™ nanoLC™ 425 with a SCIEX® 5500 QTRAP® for detection. See page 5 for conditions used for batch-to-batch comparison.

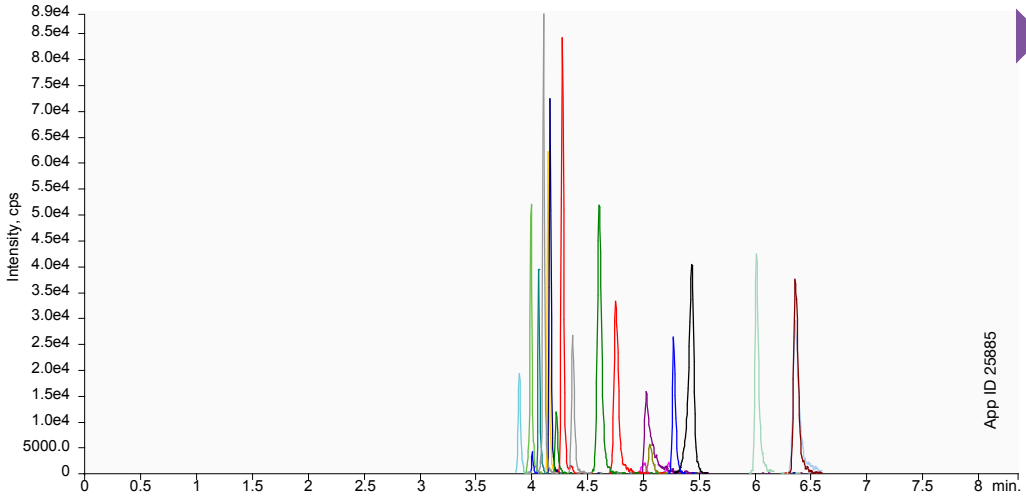
Want to learn more about micro low flow LC columns and applications? Chat with our technical experts and get a quick response! www.phenomenex.com/chat

Diverse Selectivity and Improved Performance

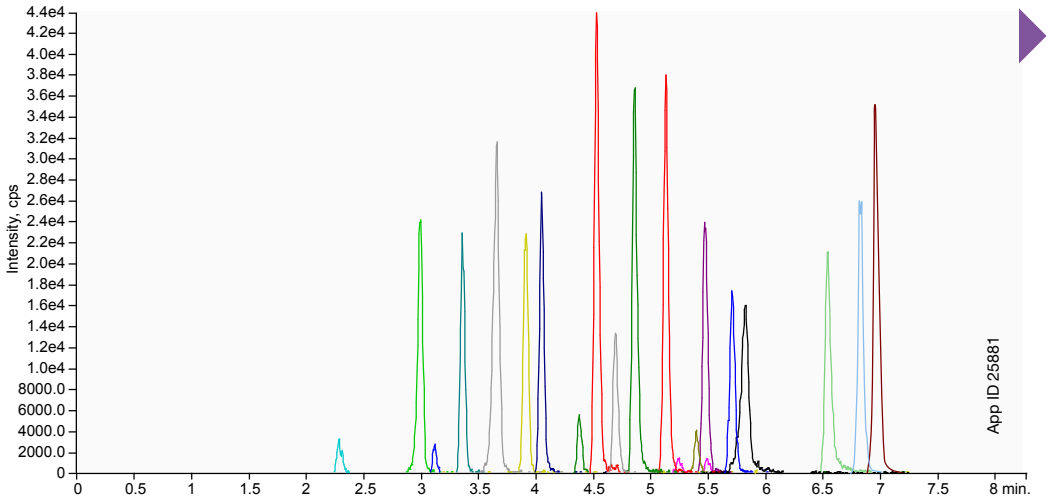
Kinetex Core-Shell Technology packed in a highly compatible micro LC column hardware makes choosing easy; now you get both selectivity and performance gains.



Micro LC Column:
Kinetex™ XB-C18
2.6 µm 50 x 0.3 mm



Micro LC Column:
Waters® nanoEase™ M/Z
Peptide BEH C18
1.7 µm 50 x 0.3 mm



Micro LC Column:
Thermo Scientific™ Acclaim™
PepMap™ C18
2 µm 50 x 0.3 mm

Micro LC Conditions

Columns: As noted
Dimension: 50 x 0.3 mm
Mobile Phase: A: Water with 0.1 % Formic Acid
B: Acetonitrile with 0.1 % Formic Acid

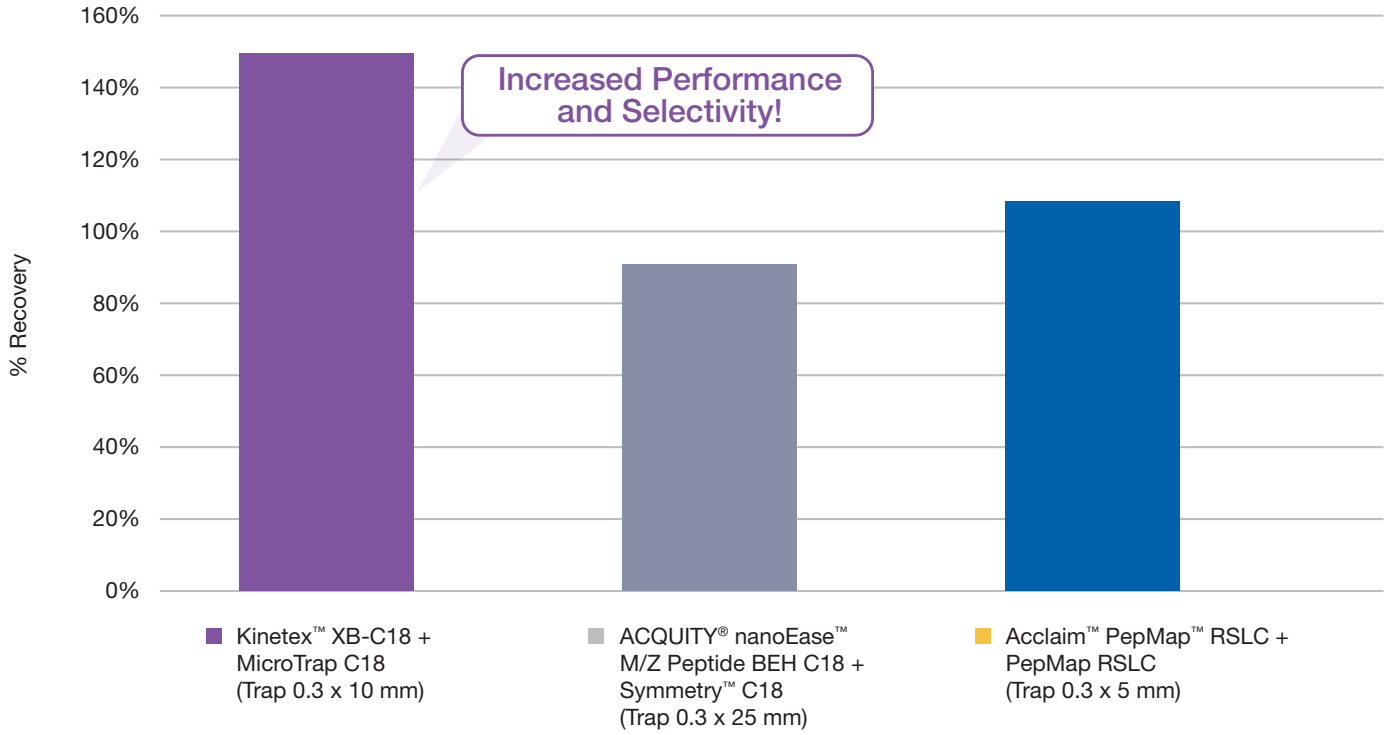
Gradient:	Time (min)	% B
	0	3
	10	40
	12	80
	14	80
	15	3
	20	3

Flow Rate: 10 µL/min
Injection Volume: 1 µL
Temperature: Ambient (25 °C)
Detection: MS/MS SCIEX® QTRAP® 5500
Injector Temp.: 4 °C
Column Temp.: 25 °C
Sample: 20 stable-isotope-labeled (SIL) peptide mix

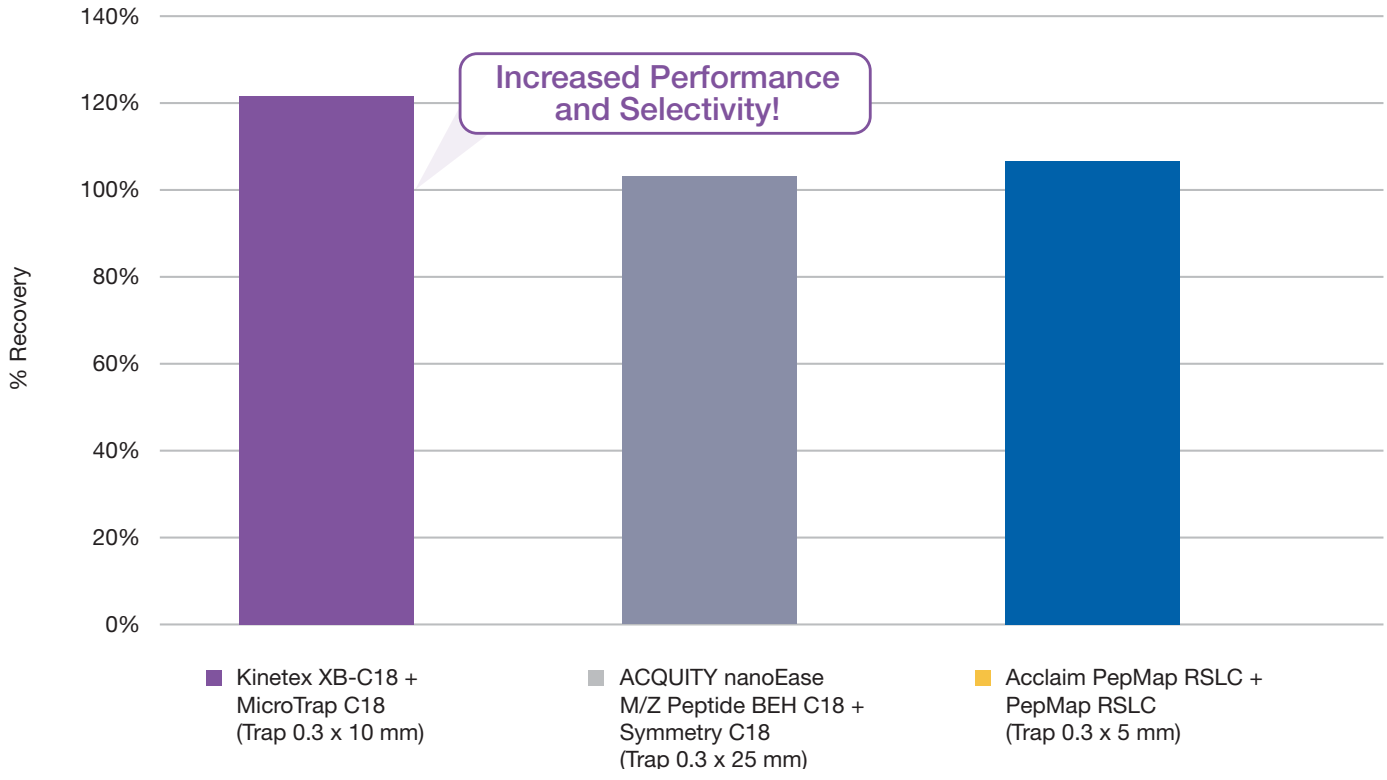
Improve Your Trap & Elute Micro LC Applications!

The total peptide percentage recovery for both peak area and peak height under trap-and-elute conditions is shown from the example on page 5.

Peak Area Total Peptide Percent Recovery



Peak Height Total Peptide Percent Recovery



Comparative separations may not be representative of all applications.

Complementary Micro LC Column and Trap Selectivity

Micro traps with integrated fittings are easy to install and add greater separation power to all your micro LC applications.

- Compatible with your system
- Extensive phase selectivity options
- Low solvent consumption
- Increased sensitivity
- UHPLC maximum pressure: 15,000 psi

Leak-free and seamless connection with torque limiting tool

Easily fit in 'hard-to-reach' places of any U/HPLC system.

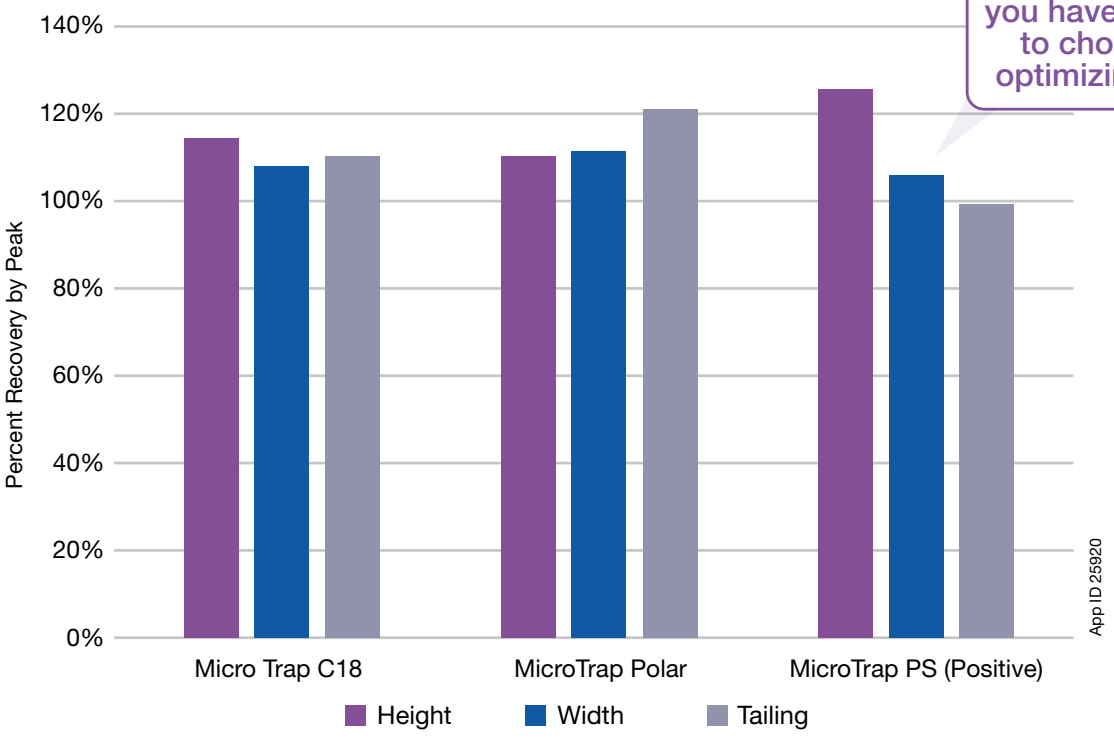
An external patent-pending tightening tool, featuring a haptic click with orque limiting technology, secures the trap to the system with high precision eliminating port damage and other performance issues.

MicroTrap Phases & Dimension

MicroTrap C18	10 x 0.15 mm	10 x 0.3 mm	10 x 0.5 mm
MicroTrap Polar	10 x 0.15 mm	10 x 0.3 mm	10 x 0.5 mm
MicroTrap PS	10 x 0.15 mm	10 x 0.3 mm	10 x 0.5 mm

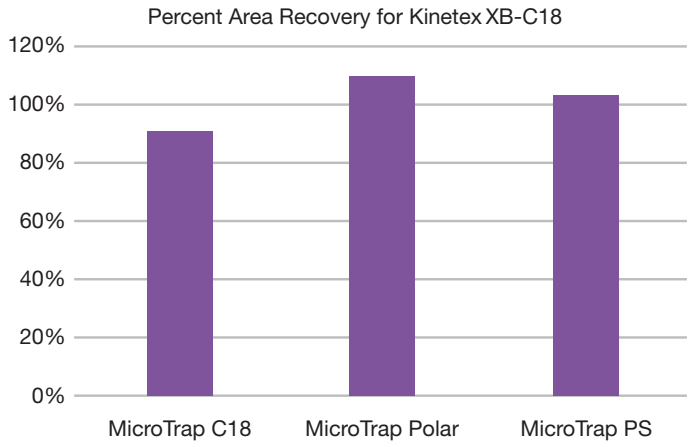
Luna Omega Polar Column with MicroTrap C18, MicroTrap Polar, or MicroTrap PS

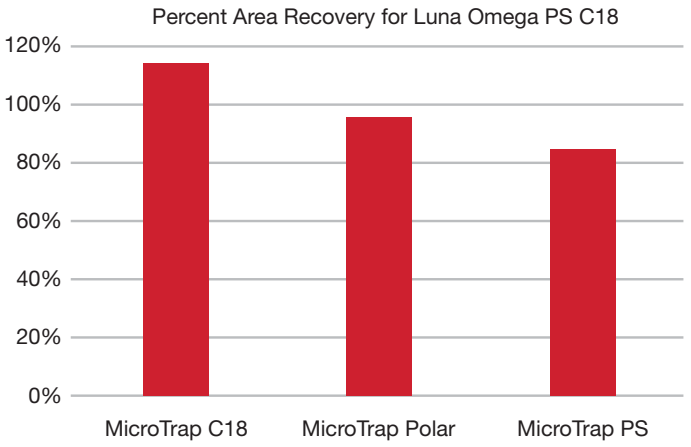
With three versatile MicroTrap selectivities, you have multiple options to choose from while optimizing your method.

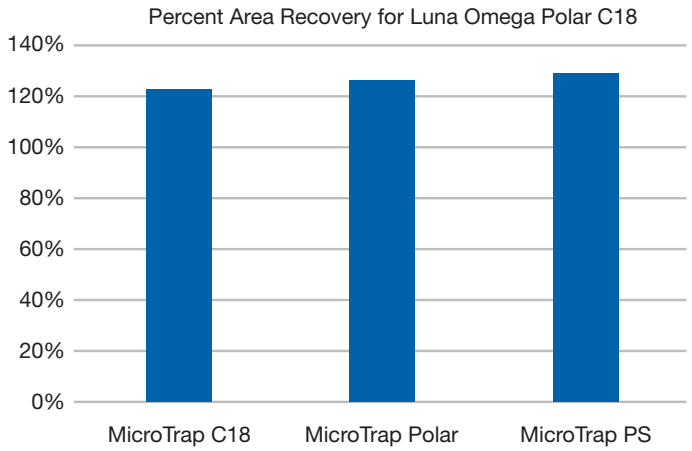


Micro LC Column and Trap Selectivity Configuration Comparison

By combining complementary and orthogonal trap columns with varying selectivities, a 20-peptide mix was analyzed. The differing combinations of column and trap selectivity yielded higher overall recovery compared to combinations with similar selectivities.







App ID 25920

The specific combination and differences between the column and trap's media can result in differences in relative recovery. The relative difference in recovery illustrates the importance of optimizing micro LC column and trap selectivity combinations and demonstrates how using different selectivity combinations can yield improved recoveries depending upon the chemical characteristics of your compounds of interest.

Tip

Test different MicroTrap selectivity combinations with your core-shell and fully porous micro LC column selectivities as unexpected combinations can yield improved recoveries depending upon the chemical characteristics of your compounds of interest.

Micro LC Conditions

Column:	Kinetex™ 2.6 µm XB C18
	Luna™ Omega 3 µm PS C18
	Luna Omega 3 µm Polar C18
Trap:	MicroTrap C18
	MicroTrap Polar
	MicroTrap PS
Dimension:	50 x 0.3 mm Micro LC Column + 10 x 0.3 mm MicroTrap
Mobile Phase:	A: Acetonitrile with 0.1 % Formic Acid
	B: Water with 0.1 % Formic Acid

Gradient:	**Time (min)**	**% B**
	0	3
	10	40
	12	80
	14	80
	15	3
	20	3

Flow Rate:	10 µL/min
Temperature:	Ambient (25 °C)
Detection:	MS/MS SCIEX® QTRAP® 5500
Injector Temp.:	4 °C
Column Temp.:	25 °C
Injection Volume:	1 µL
Sample:	20 stable-isotope-labeled (SIL) peptide mix

Select Your Micro and Trap Columns by Application

- Compatible with Your System
- Dependable and Available
- Wide Range of Selectivities

Phenomenex has extended its large range of high quality reversed phase selectivities to capillary and trap formats. These materials will allow you to achieve greater separation power for all your Micro LC applications.

General Selectivity and Popular Application Recommendations

General Purpose C18	Luna Omega C18 | MicroTrap C18
	Kinetex C18 | MicroTrap C18
Very Hydrophobic Compounds	Luna C8(2) | MicroTrap PS
	Jupiter™ C4 | MicroTrap WP C4
Polar Bases	Luna Omega PS C18 | MicroTrap C18
	Synergi™ RP-Polar | MicroTrap Polar
Aromatic Compounds*	Kinetex Biphenyl | MicroTrap Polar
	Luna Phenyl-Hexyl | MicroTrap Polar
Polar Acids	Luna Omega Polar C18 | MicroTrap C18
	Kinetex XB-C18 | MicroTrap PS
Isomers and Closely Related Compounds*	Kinetex F5 | MicroTrap Polar
	Kinetex Biphenyl | MicroTrap Polar
HILIC Conditions	Luna HILIC
	Luna NH_2
Alkaline Mobile Phase	Gemini™ C18
	Kinetex EVO C18
Intact Proteins	Jupiter C4 | MicroTrap WP C4
	Jupiter C18 | MicroTrap WP C4
Peptide Quantitation	Luna Omega Polar C18 | MicroTrap C18
	Luna C18(2) | MicroTrap C18
Peptide Mapping	Luna Omega Polar C18 | MicroTrap C18
	Kinetex XB-C18 | MicroTrap PS
Metabolomics Screening	Kinetex F5 | MicroTrap PS
	Luna NH_2

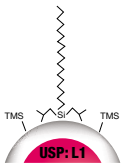
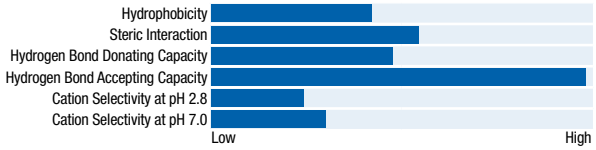
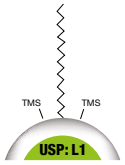
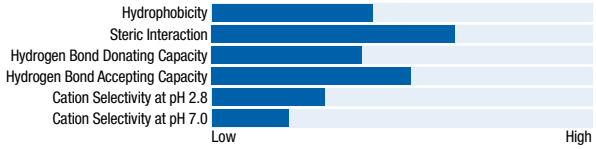
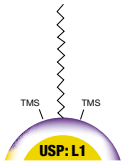
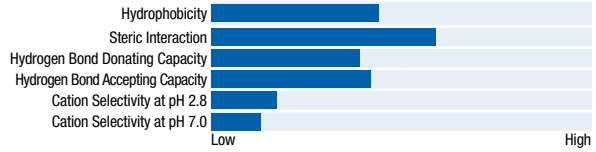
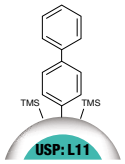
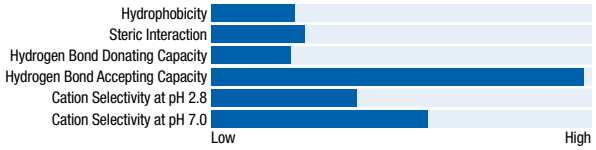
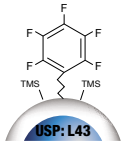
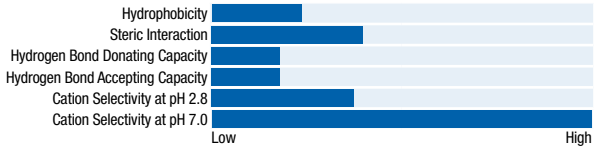
*Phenyl-based phases are generally recommended for both Aromatic and Closely Related Compounds.

See pages 15-16 for Micro LC Column & Trap ordering information.

Kinetex
Core-Shell Technology

The finely tuned and unique core-shell manufacturing process delivers dramatic improvements in efficiency over conventional fully porous media which can be leveraged to increase resolution, reduce solvent consumption, decrease costs, and greatly improve productivity. The Kinetex core-shell family can deliver shockingly improved performance to your Micro LC separation.

Phases

Ligand	Description	Selectivity Profile
	**Kinetex XB-C18** Di-isobutyl side chains differentiate this C18 column. Low ligand density and an inactive surface makes this column a great hydrogen acceptor. This phase will demonstrate improved peak shape for basic compounds and increased retention of acids.	
	**Kinetex C18** Very well balanced column providing some selectivity through steric, hydrogen, and cationic pathways. This is a great starting point for ultra-high efficiency separations.	
	**Kinetex EVO C18** Novel pH 1-12 stable C18 that delivers robust methods and improved peak shape for bases.	
	**Kinetex Biphenyl** 100% aqueous stable reversed phase chemistry with hydrophobic, aromatic, and enhanced polar selectivity.	
	**Kinetex F5** This pentafluorophenyl propyl column provides a very high degree of steric selectivity to separate structural isomers. The electronegative fluorine groups offer high selectivity for cationic compounds.	

Material Characteristics

Packing Material	Total Particle Size (µm)	Pore Size (Å)	Effective Surface Area (m^2/g)	Effective Carbon Load %	pH Stability	Pressure Stability
XB-C18	2.6	100	200	10	1.5-8.5*	1,034 bar
C18	2.6	100	200	12	1.5-8.5*	1,034 bar
EVO C18	2.6	100	200	11	1.0-12.0	1,034 bar
Biphenyl	2.6	100	200	11	1.5-8.5*	1,034 bar
F5	2.6	100	200	9	1.5-8.5*	1,034 bar

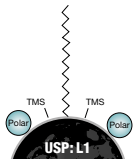
* pH stability under gradient conditions. pH stability is 1.5 - 10 under isocratic conditions.

Luna Omega
Cutting Edge Fully Porous Silica

One of the world's leading HPLC brands, now enhanced for incredible HPLC, UHPLC, and Micro LC performance! Luna Omega columns culminate over 20 years of technological prowess, advancements, and innovation from Phenomenex! With astounding efficiency levels, highly versatile selectivities, and trusted accuracy, Luna Omega columns will take your chromatographic experience to a new level.

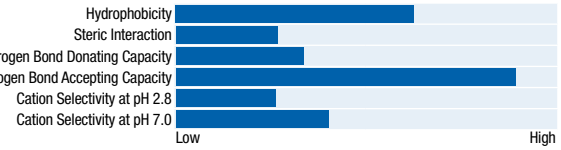
Phases

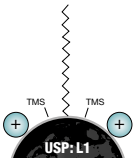
Ligand	Description	Selectivity Profile



Luna Omega Polar C18

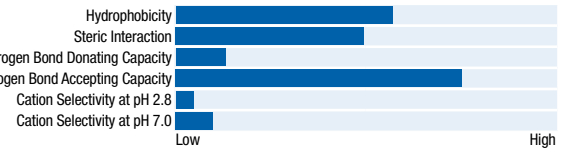
100% aqueous stability and enhanced selectivity/retention for polar analytes without diminishing useful non-polar retention. The C18 ligand provides general hydrophobic interactions while a polar modified particle surface provides enhanced polar compound retention.

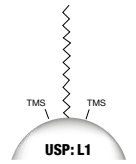




Luna Omega PS C18

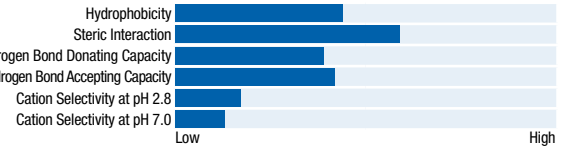
Unique, 100% aqueous stable mixed-mode phase that provides both polar and non-polar retention. The surface contains a positively charged ligand which aids in the retention of acidic compounds through ionic interactions, while the C18 ligand promotes general reversed phase hydrophobic retention. The positively charged surface also improves basic compound peaks shape through ionic repulsion.

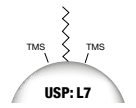




Luna C18(2)

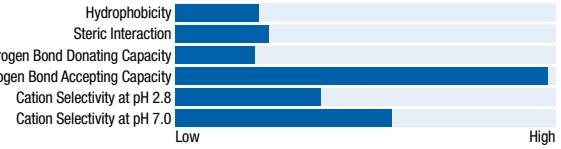
C18 phase is densely bonded to provide high hydrophobic retention and discriminating steric selectivity. High endcapping reduces electrostatic based selectivity to a minimum.

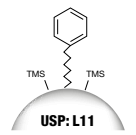




Luna C8(2)

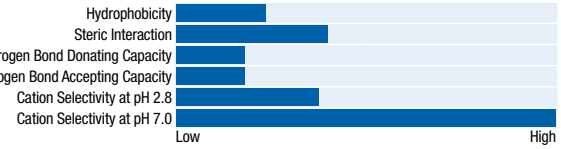
C8 column provides less hydrophobic retention than our C18, but the density of the ligand bonding creates more steric based selectivity. The C8 columns are generally better hydrogen bond acceptors, and better for acidic compounds.

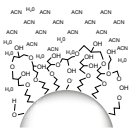




Luna Phenyl-Hexyl

Our most hydrophobic phenyl column and it will also provide good hydrogen accepting functionality for acidic retention.





Luna HILIC

HILIC phase that provides excellent selectivity for polar compounds; and improved MS sensitivity with low bleed.

Material Characteristics

Packing Material	Particle Sizes (µm)	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	pH Stability	Pressure Stability
Polar C18	3, 5	100	260	9	1.5 - 8.5*	1,034 bar
PS C18	3, 5	100	260	9	1.5 - 8.5*	1,034 bar
C18(2)	3, 5	100	400	17.5	1.5 - 9.0*	345/bar
C8(2)	3, 5	100	400	13.5	1.5 - 9.0*	345/bar
Phenyl-Hexyl	3, 5	100	400	17.5	1.5 - 9.0*	345/bar
HILIC	3, 5	200	200	5.7	1.5 - 8.0	345/bar

* pH stability under gradient conditions. pH stability is 1.5 - 10.0 under isocratic conditions.

Faith in a Micro LC Column Connection
Security in a Click

By combining complementary and orthogonal trap columns with varying selectivities, a 20-peptide mix was analyzed. The differing combinations of column and trap selectivity yielded higher overall recovery compared to combinations with similar selectivities.

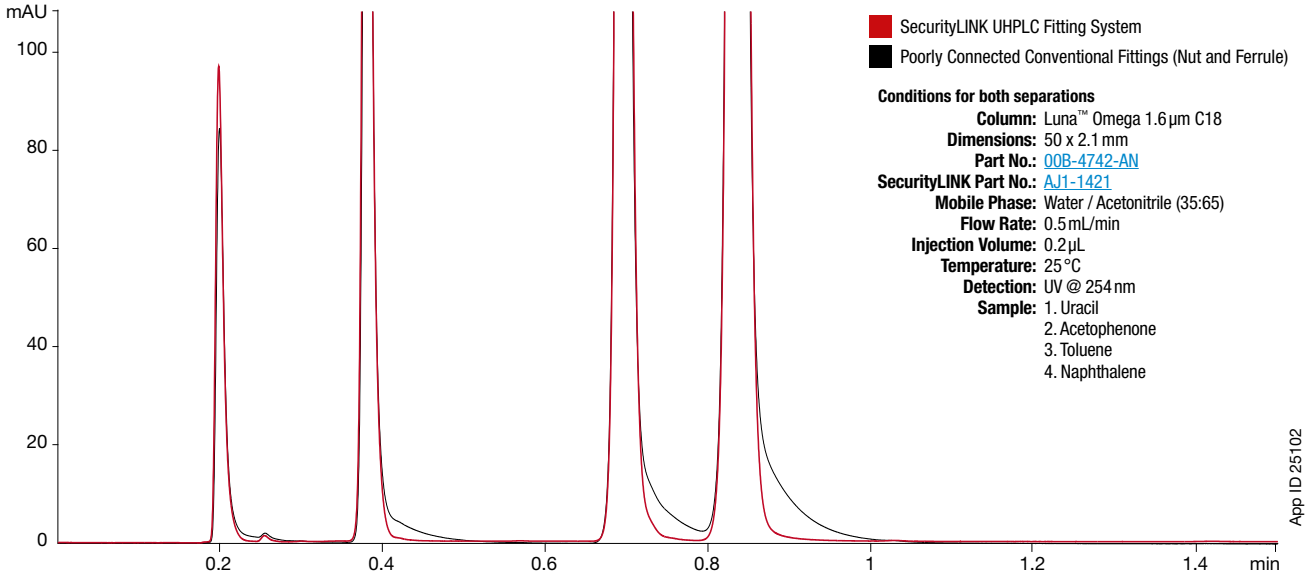
SecurityLINK™ Fingertight HPLC and UHPLC Connections

- No tools required for quick and easy installation
- Fitting self-adjusts at column inlet to ensure zero dead-volume for better chromatographic results
- Torque limiting technology prevents system and column port damage
- UHPLC and HPLC compatibility: pressure rated to 19,000 psi (1,310 bar)

Order now at
www.phenomenex.com/SecurityLINK

SecurityLINK vs. Poorly Connected Conventional Fittings

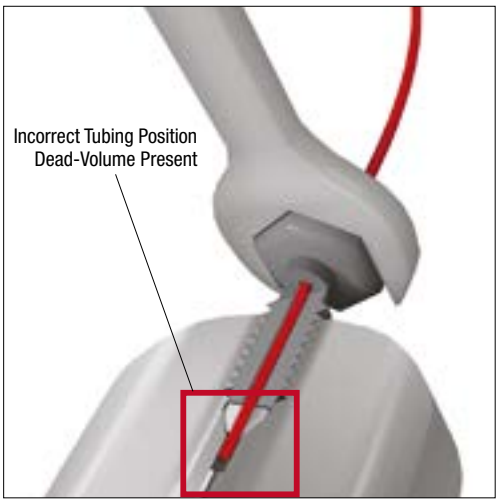
Poorly connected fittings are often the cause of carryover, band broadening, and peak tailing. SecurityLINK offers zero dead-volume connections every time.



SecurityLINK UHPLC Fitting System

VS.

Poorly Connected Conventional Fittings (Nut and Ferrule)



Order now at www.phenomenex.com/SecurityLINK

Micro LC Column Ordering Information

2.6 µm Micro LC Columns (mm)	NEW							
Phase	**50 x 0.15**	**150 x 0.15**	**30 x 0.3**	**50 x 0.3**	**100 x 0.3**	**150 x 0.3**	**50 x 0.5**	**150 x 0.5**
Kinetex™ Biphenyl 100 Å	—	—	—	00B-4622-AC	—	00F-4622-AC	00B-4622-AF	—
Kinetex C18 100 Å	—	—	00A-4462-AC	00B-4462-AC	—	00F-4462-AC	00B-4462-AF	—
Kinetex EVO C18 100 Å	00B-4725-AG	00F-4725-AG	—	00B-4725-AC	—	00F-4725-AC	00B-4725-AF	—
Kinetex F5 100 Å	—	—	—	00B-4723-AC	00D-4723-AC	00F-4723-AC	00B-4723-AF	—
Kinetex XB-C18 100 Å	00B-4496-AG	00F-4496-AG	00A-4496-AC	00B-4496-AC	00D-4496-AC	00F-4496-AC	00B-4496-AF	00F-4496-AF

3 µm Micro LC Columns (mm)							
Phase	**30 x 0.3**	**50 x 0.3**	**100 x 0.3**	**150 x 0.3**	**50 x 0.5**	**100 x 0.5**	**150 x 0.5**
Luna™ C8(2)100 Å	—	00B-4248-AC	—	—	00B-4248-AF	—	—
Luna C18(2) 100 Å	—	00B-4251-AC	00D-4251-AC	00F-4251-AC	00B-4251-AF	00D-4251-AF	00F-4251-AF
Luna NH2 100 Å	—	—	—	00F-4377-AC	—	—	—
Luna HILIC 200 Å	—	—	—	—	00B-4449-AF	—	—
Luna Phenyl-Hexyl 100 Å	—	—	00D-4256-AC	—	—	00D-4256-AF	—
Luna Omega C18 100 Å	00A-4784-AC						
Luna Omega PS C18 100 Å	—	00B-4758-AC	00D-4758-AC	00F-4758-AC	00B-4758-AF	00D-4758-AF	00F-4758-AF
Luna Omega Polar C18 100 Å	—	00B-4760-AC	00D-4760-AC	00F-4760-AC	00B-4760-AF	00D-4760-AF	00F-4760-AF
Gemini® C18 110 Å	—	00B-4439-AC	—	00F-4439-AC	00B-4439-AF	—	—

4 µm Micro LC Columns (mm)							
Phase	**50 x 0.3**	**100 x 0.3**	**150 x 0.3**	**250 x 0.3**	**50 x 0.5**	**150 x 0.5**	**250 x 0.5**
Synergi™ Max-RP 80 Å	—	—	—	—	00B-4337-AF	00F-4337-AF	—
Synergi Hydro-RP 80 Å	00B-4375-AC	00D-4375-AC	00F-4375-AC	00G-4375-AC	00B-4375-AF	—	00G-4375-AF
Synergi Fusion-RP 80 Å	—	—	00F-4424-AC	—	—	00F-4424-AF	—
Synergi Polar-RP 80 Å	—	—	—	—	—	00F-4336-AF	—
Jupiter™ Proteo 90 Å	00B-4396-AC	—	00F-4396-AC	—	—	00F-4396-AF	—

5 µm Micro LC Columns (mm)					
Phase	**50 x 0.3**	**150 x 0.3**	**50 x 0.5**	**150 x 0.5**	**250 x 0.5**
Luna C8(2) 100 Å	—	00F-4249-AC	—	—	—
Luna C18(2)100 Å	—	00F-4252-AC	—	00F-4252-AF	00G-4252-AF
Luna Phenyl-Hexyl 100 Å	00B-4257-AC	—	00B-4257-AF	—	—
Luna Omega Polar C18 100 Å	00B-4760-AC	00F-4760-AC	00B-4760-AF	00F-4760-AF	—
Luna Omega PS C18 100 Å	00B-4758-AC	00F-4758-AC	00B-4758-AF	00F-4758-AF	—
Jupiter C18 300 Å	00B-4053-AC	—	00B-4053-AF	00F-4053-AF	—
Jupiter C4 300 Å	00B-4167-AC	—	00B-4167-AF	—	—

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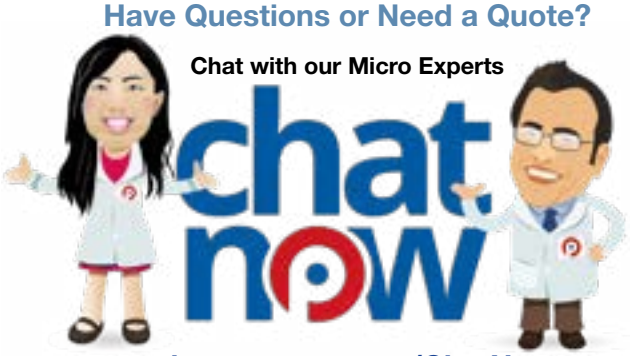
Chat with our Micro Experts



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Micro LC Trap Selectivities

Tip! It's recommended that you optimize the selectivity between your Micro LC trap and column configuration to maximize your separation performance. See page 9 for phase recommendations.

Micro/Nano Trap Columns

Part Number	Product Name	Dimensions (length x ID mm)	Unit
06N-4252-AW	Nano Trap Column RP-1 (General RP) ET	10 x 0.075 mm	2/pk
06N-4754-AW	Nano Trap Column RP-2 (Aqueous Stable RP) ET	10 x 0.075 mm	2/pk
06N-4252-AG	Micro Trap Column C18 ET	10 x 0.150 mm	2/pk
06N-4753-AG	Micro Trap Column PS ET	10 x 0.150 mm	2/pk
06N-4754-AG	Micro Trap Column Polar ET	10 x 0.150 mm	2/pk
06N-4252-AC	Micro Trap Column C18 ET	10 x 0.30 mm	2/pk
06N-4753-AC	Micro Trap Column PS ET	10 x 0.30 mm	2/pk
06N-4754-AC	Micro Trap Column Polar ET	10 x 0.30 mm	2/pk
06N-4167-AC	Micro Trap Column Widepore C4 ET	10 x 0.30 mm	2/pk
06N-4252-AF	Micro Trap Column C18 ET	10 x 0.50 mm	2/pk
06N-4754-AF	Micro Trap Column Polar ET	10 x 0.50 mm	2/pk

Part Number	Product Name	Dimensions (length x ID mm)	Unit
05N-4252-AW	Nano Trap RP-1 (General RP)	10 x 0.0750 mm	3/pk
05N-4754-AW	Nano Trap RP-2 (Aqueous Stable RP)	10 x 0.0750 mm	3/pk
05N-4252-AC	Micro Trap C18	10 x 0.30 mm	3/pk
05N-4753-AC	Micro Trap Positive C18	10 x 0.30 mm	3/pk
05N-4754-AC	Micro Trap Polar C18	10 x 0.30 mm	3/pk
05N-4167-AC	Micro Trap Widepore C4	10 x 0.30 mm	3/pk
05N-4252-AF	Micro Trap C18	10 x 0.50 mm	3/pk
05N-4753-AF	Micro Trap Positive C18	10 x 0.50 mm	3/pk
05N-4754-AF	Micro Trap Polar C18	10 x 0.50 mm	3/pk
05N-4167-AF	Micro Trap Widepore C4	10 x 0.50 mm	3/pk

Part Number	Product Name	Unit
AJ2-9000	SecurityLINK ET Tightening Tool	Ea

MicroTraps Fittings

Part No.	Description	Unit
AQ0-7602	PEEKLok™ fittings with 6-40 thread for 1/32" OD tubing (2 x fittings, 6 x ferrules and 1 x tightening tool)	ea
AQ0-7603	PEEKLok fittings with 6-32 thread for 1/32" OD tubing (2 x fittings, 6 x ferrules and 1 x tightening tool)	ea
AQ0-7601	PEEKLok fittings with 10-32 thread for 1/16" OD tubing with low profile hex head (2 x fittings, 6 x ferrules and 1 x wrench)	ea

MicroTraps

Threads per Inch	Pitch (inches)	Pitch (mm)
32	0.0313	0.794
40	0.025	0.635

CAUTION: The installation of an improper nut could potentially cause cross-threading or damage to the port and fitting

Verify fit: Micro LC Traps are available for 1/16" connections (10–32 thread) or with 1/32" connections (6–40 or 6-32 thread).

Product Guide

Micro LC Columns and Traps

Improve Your Micro LC Applications with NEW Column and Trap Selectivities

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