

INNOVATION IN HIGH-SENSITIVITY LC-MS RESEARCH

NEW OBJECTIVE



PRODUCT CATALOG 2013



# Leading high-sensitivity LC-MS research through innovative life science tools.

## LEADERS IN NANOSPRAY INNOVATION

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Founded in 1997 on PicoTip® technology, a revolutionary line of emitters for LC-MS, New Objective has remained on the cutting-edge of nanobore chromatography and nanospray-based mass-spectrometry through close communication with our customers, continuous innovation, and dedication to quality.

Gary Valaskovic, New Objective's co-founder, explains the company's customer-driven culture: "Our hands-on sales and support approach ensures that our customers have a direct line to the company. Mutually beneficial, it's through this continual communication loop that New Objective is able to improve upon current products and meet our customers' changing needs."

Through this open line of communication, the original PicoTip® product line quickly expanded. New columns and emitters were added, including PicoFrit® columns, which combine a nanobore column with an integral ESI emitter. In order to maximize nanospray productivity and reproducibility, the PicoView® source was developed to work in conjunction with PicoTip emitters and PicoFrit columns. Digital PicoView models expand the user's control and flexibility to enable the ultimate in sensitivity and experimental design.

With a need for faster, more consistent, and easy-to-use technology, New Objective's most recent product, the PicoChip®, was born. PicoChip brings to market all of the sensitivity that nanospray provides by capitalizing on more than a decade of nanospray research and development and from really listening to customer's needs. PicoChip embodies a culmination of customer driven research to deliver high-performance nanospray in an easy-to-use device.

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NEW OBJECTIVE



*“I have been working with the team at New Objective for many years now and consider them essential to my research efforts. Their PicoFrit columns were of critical importance in the successful implementation of capillary HPLC-ESI/MS/MS in my laboratory.”*

Susan T. Weintraub, Ph.D.

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## simple, consistent, performance

PicoChip® is a revolutionary system for nanospray LC-MS combining the proven high-performance of the PicoFrit® column with the ease-of-use of a chip-based system. Single-connection, position-optimized, and factory-verified voltage connections provide the ultimate in performance, reliability and consistency across all platforms.

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## optimal sensitivity & reliability

PicoFrit® nanospray columns ensure the highest possible performance, combining powerful chemistries with a novel format that eliminates post-column loss. Designed and tested for applications that require optimal peak shape and ultimate sensitivity, these columns provide unsurpassed performance, reliability and ruggedness.

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## ideal for control & flexibility

IntegraFrit™ columns are the building blocks of your high performance analytical method. The exceptional flexibility, consistency and stability are the hallmark of these non-metal fritted columns, and allow the full potential of nanospray to be harnessed with the benefits of superior control and performance independent of your analysis platform.

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## Efficient, Simple, Plug & Spray Operation

You've asked for it and we listened! We've taken the industry-proven performance of our PicoFrit® columns, incorporated a factory-verified onboard high-voltage connection, and integrated it all in a simple to use, rugged form.

The PicoChip® nanospray system has been developed in close collaboration with leading pharmaceutical scientists to deliver simplicity and ease of operation—without compromising performance or sensitivity.

### What is a PicoChip?

You're already using PicoChip components! You assemble them and probably re-assemble them every day. PicoChip is factory-certified nanobore connections, a factory-verified high-voltage union, and the superior sensitivity of a PicoFrit column all packaged in a disposable, easy to use, plug and spray format. All delivered at an economical price!



- Emitter



- Voltage Union



- Chromatography Column



- Transfer Line

We need this to be **easy to use...**  
But we don't want to give up **any performance."**

*Nathan Yates  
University of Pittsburgh*

#### INSIDE - PICOFRIT IS THE WORKHORSE

The industry-proven PicoFrit is a precision made PicoTip® emitter, that is factory-fritted to provide a stable base for the chromatography bed. The frit ensures that the chemistry media is distributed evenly for consistent chromatographic performance.

#### THROUGH-THE-ROOF SENSITIVITY

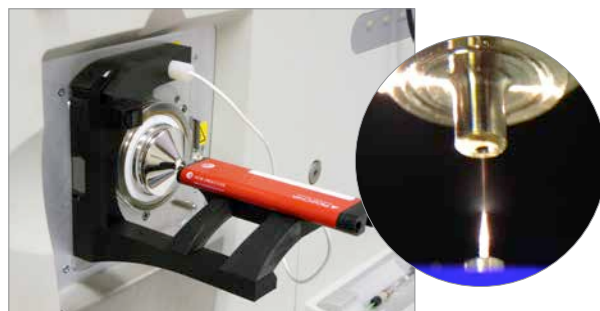
Having a PicoFrit column inside the PicoChip means that there is no post-column loss, no post-column mixing, and no extra-column band-broadening. You're spraying right off of the end of the column, so peaks are sharper and sensitivity is maintained. Order PicoChip columns packed with any of our in-house media. PicoChips can be custom-packed to your specifications—even using your supplied media.



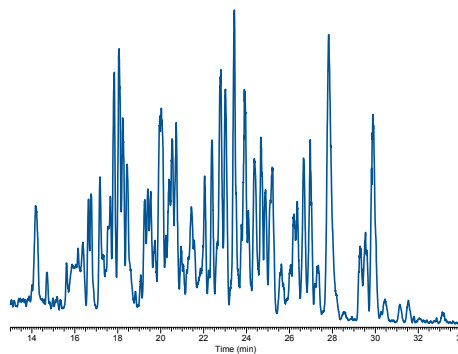
Entire PicoChip starter package includes everything you need to be up and collecting data within 10 minutes of opening the box. The PicoChip stage and two PicoChip columns along with an alignment chip are included. Infusion PicoChips are available, separately.

#### NO FIDDLY-BITS

The PicoFrit, the voltage union, the fused-silica tubing; they're industry-standard technology. What's new is that they are all assembled and ready for use right out of the box: Factory-tested connections, flow-tested columns, and machine-inspected tips.



The column tip is safely protected inside the PicoChip until ready for use. When placed on the source, the tip is exposed and the voltage connection is completed.

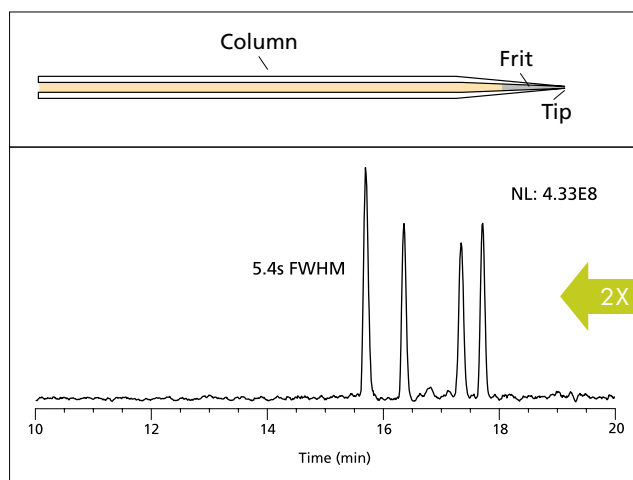


PicoChip column packed with 10.5 cm of 3  $\mu$ m ReproSil-Pur C18 AQ; 50 fmol 6 bovine protein digest equal molar mix, 300 nL/min.; gradient: 2% B to 50% B over 30 min.

## The Ultimate LC-MS Proteomics Platform

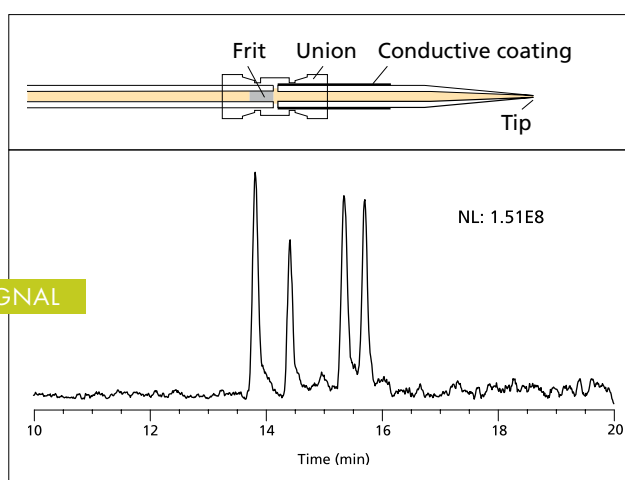
Patented PicoFrit® columns combine the consistency and reliability of our PicoTip® emitters with the flexibility and control of a standard IntegraFrit™ column into a single, zero-dead-volume column. Spraying directly off of the outlet of the column, the PicoFrit format eliminates post column loss, increases sensitivity and provides the sharpest peaks. The integral frit in the tip provides a stable bed for a variety of chromatography media. This technology ensures consistent dispersion and less clog-inducing media particle destruction, which keeps back pressures lower.

### INTEGRAL PICOFRIT COLUMN



A chromatogram was obtained using a standard C18-packed PicoFrit column. The PicoFrit yields better peak shape with decreased peak width and higher sensitivity.

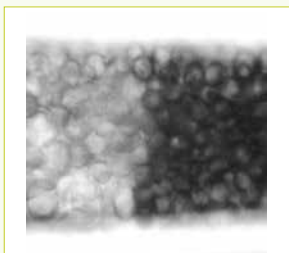
### STANDARD COLUMN COUPLED TO AN EMITTER



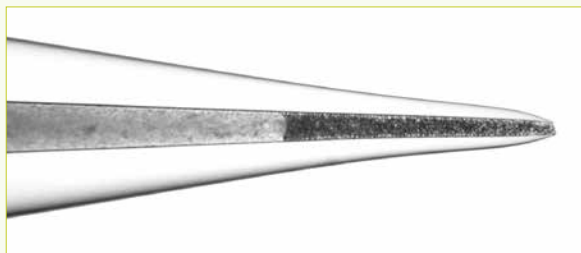
A chromatogram was obtained using a standard C18-packed column coupled to an emitter with a PEEK union

← 2X SIGNAL

### PICOFRIT ANATOMY



A magnified view of the junction in the PicoFrit column where the chromatography bed meets the frit



A magnified view of a PicoFrit column packed with 5 µm C18 media. The fritted tip keeps the media from packing too tightly into the taper, reducing clogging and keeping back pressures low. Column dimensions: 360 µm OD x 75 µm ID x 15 µm tip opening.



A magnified view of the fritted tip of the PicoFrit column (15 µm tip)

## Clog-Resistant & Cost-Efficient

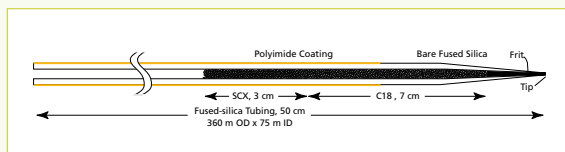
With no emitter to be attached, there's no emitter to clog. The particulates that clog an emitter are generally introduced at the junction between the column and the emitter. The emitter of a PicoFrit® is the column, and therefore, far less likely to clog. The column bed itself protects the emitter taper from backing up with debris.

PicoFrit columns are more economical than a standard tip-column configuration. Save setup time with no emitters to connect and cut costs associated with fittings required for connection.

### MULTI-PHASIC PICOFRIT COLUMNS

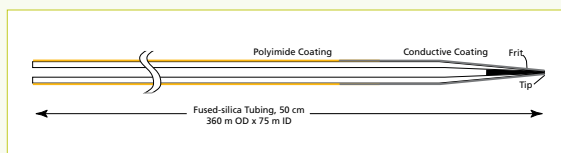


PicoFrit columns are the perfect format for biphasic and multi-dimensional analysis. Combining your preferred chemistry with SCX media in a single bed eliminates excesses of both swept- and dead-volumes.

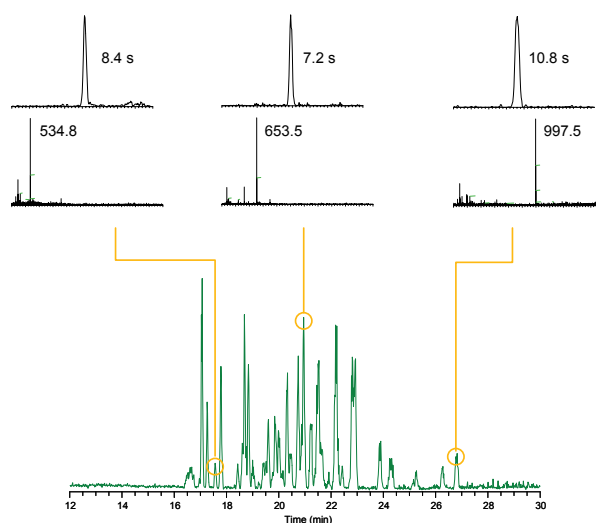


### FRITTED EMITTER

Unpacked PicoFrit columns are available with and without a standard conductive coating. Trim an empty PicoFrit to the specified size for your source to make a robust, fritted nanospray emitter. If you prefer to pack your own columns, these empty PicoFrit columns are shipped 50 cm in length, ready for your packing.

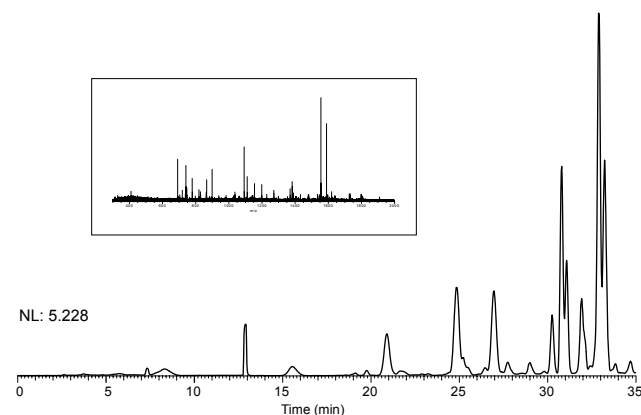


## SENSITIVITY. SELECTIVITY. STABILITY.

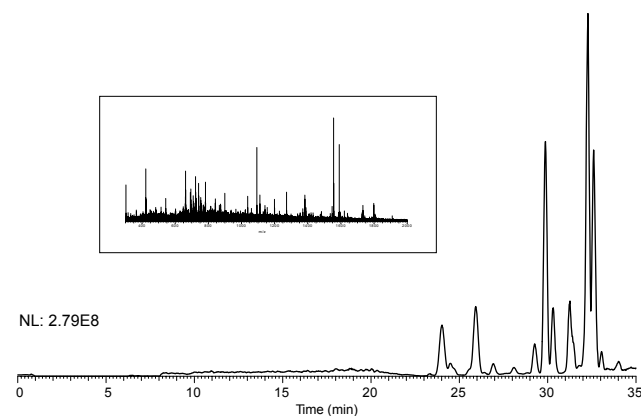


A PicoFrit column (75  $\mu$ m OD/15  $\mu$ m tip) packed with 5 cm of HALO C18 2.7  $\mu$ m produces exceptional peaks with no post-column loss in this BSA digest analysis. Flow rate: 300 nL/min.; back pressure 1,100 psi; Gradient: 2% B to 50% B over 29 min.

## NEGATIVE ION MODE



Base-peak chromatogram of  $\beta$ -casein digest evaluated using PicoFrit column containing 10 cm of ProteoPep™ II C18 5  $\mu$ m in negative-ion mode with SF<sub>6</sub> sheath gas

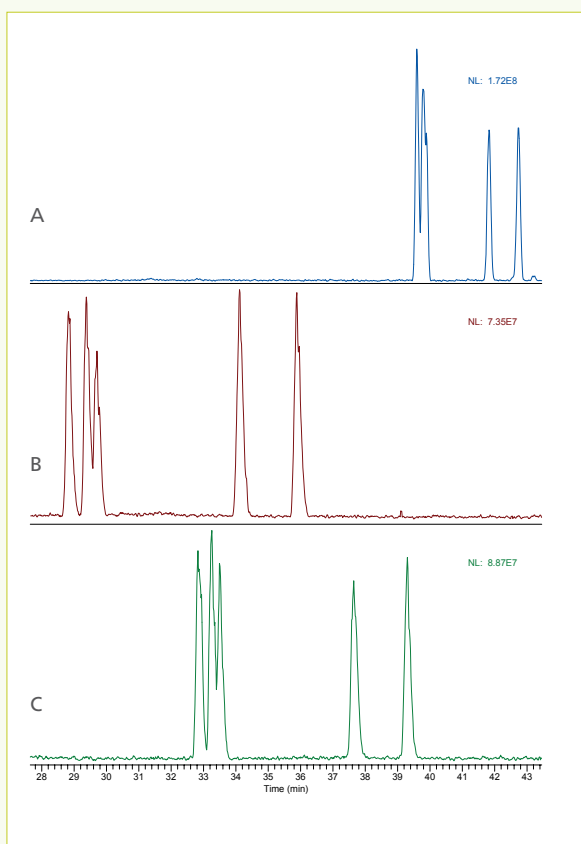
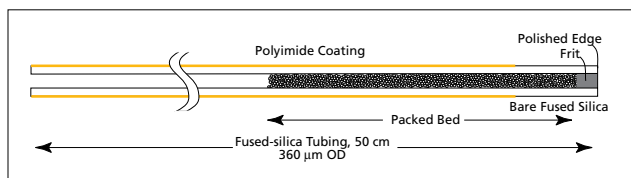
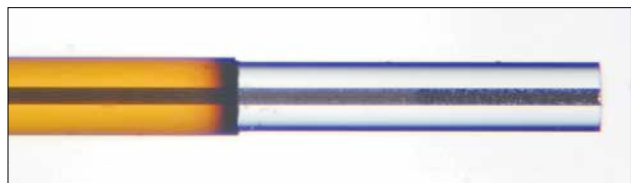


Same analysis as above without SF<sub>6</sub> sheath gas



# INTEGRAFRIT™

NANOSPRAY COLUMNS



Angiotensin chromatographic data collected with each of 3 column-union configurations: A) a single 30 cm C18 PicoFrit column, B) a 20 cm C18 IntegraFrit Column + a 10 cm C18 PicoFrit column, and C) two 10 cm C18 IntegraFrit columns + a 10 cm C18 PicoFrit column. In all cases, a zero-dead-volume PicoClear union was used. Injection: 0.25 ng total peptide; Flow rate: 300 nL/min.; Gradient: 2% - 50% B over 70 min.

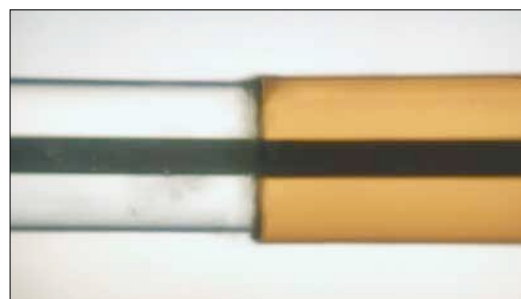
PicoClear U.S. Patent 7,681,926

## Consistency You Can Count On

Like PicoFrit® columns, IntegraFrit™ columns are fabricated from 360 μm OD, polyimide-coated, fused-silica tubing, but without a tip. The fritted end of the fused-silica column is polished flat to ensure a clean connection to your emitter of choice or to the inlet of a second column. Each IntegraFrit column has an integral high-porosity frit, behind which is the packed chromatography bed. The frit virtually eliminates peak tailing caused by other extra-column frits.

## Versatile Reliability

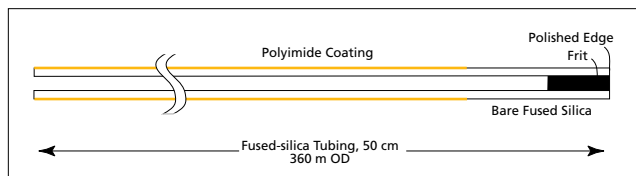
Coupling columns of the same or different resin materials is often employed in complex proteomic digest analysis. Despite enhanced separation, multidimensional columns are costly, and initiate post-column through dead-volume introduction. Using transparent, true zero-dead-volume PicoClear™ unions in conjunction with IntegraFrit columns, flush connections can easily be achieved, and rapid swap-out of column materials is made possible. Data collected (left) using bench-top assembled columns demonstrate negligible resolution loss.



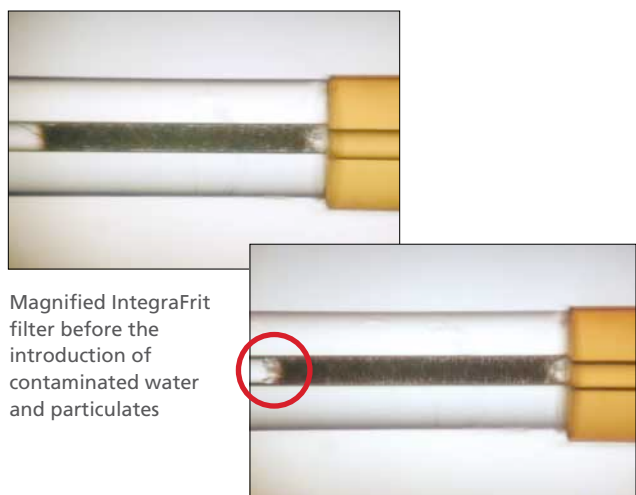
A 10 cm PicoFrit column is connected to a 20 cm IntegraFrit column using a PicoClear union with no extra volume added. The connected columns perform as well as the original 30 cm length intact column.

### SELF-PACK INTEGRAFRIT™ COLUMNS

Like PicoFrit® columns, IntegraFrit™ columns are available without media, fritted and ready to be packed in your lab. But IntegraFrits can be used in a number of ways. Use an unpacked IntegraFrit with a PicoClear™ union to make a visible, metal-free inline filter.

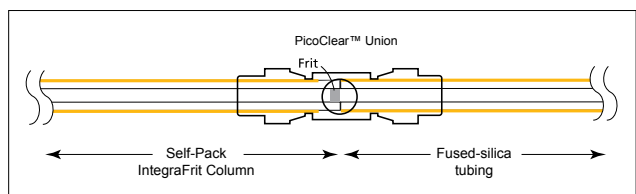


A Self-Pack IntegraFrit is plumbed into the inlet side of a PicoClear union at any point in the flow path. The visible connection can be observed during analysis for particulate accumulation and can be invaluable in troubleshooting issues.



Magnified IntegraFrit filter before the introduction of contaminated water and particulates

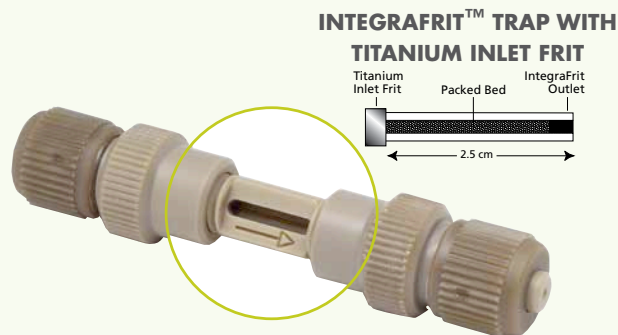
The same magnified IntegraFrit filter after two hours of filtering contaminated water



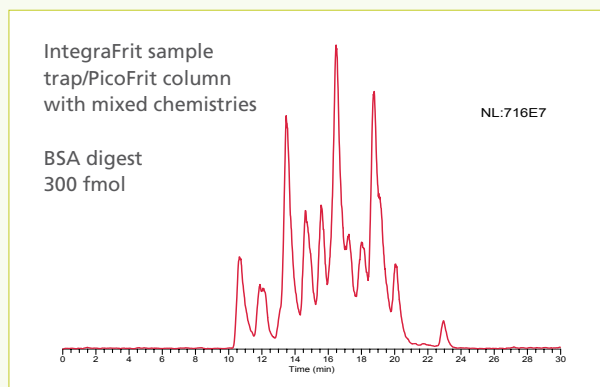
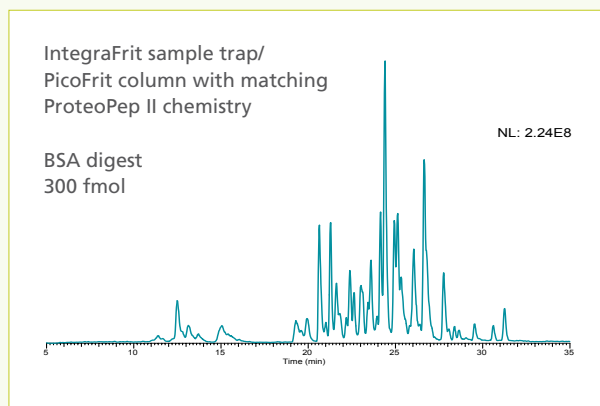
Self-Pack IntegraFrit column plumbed into the PicoClear union

For more information on PicoClear connectors, visit our website at [www.newobjective.com](http://www.newobjective.com)

### IntegraFrit™ Sample Trap Columns



IntegraFrit sample traps combined with Upchurch Scientific® fittings are a perfect combination for concentrating and separating samples for mass spectrometry. Integrated with a titanium inlet frit in the cartridge, the IntegraFrit sample trap column features a non-metal outlet frit in 360 μm OD fused-silica tubing. IntegraFrit sample trap columns can be packed with any of our outstanding chemistries.



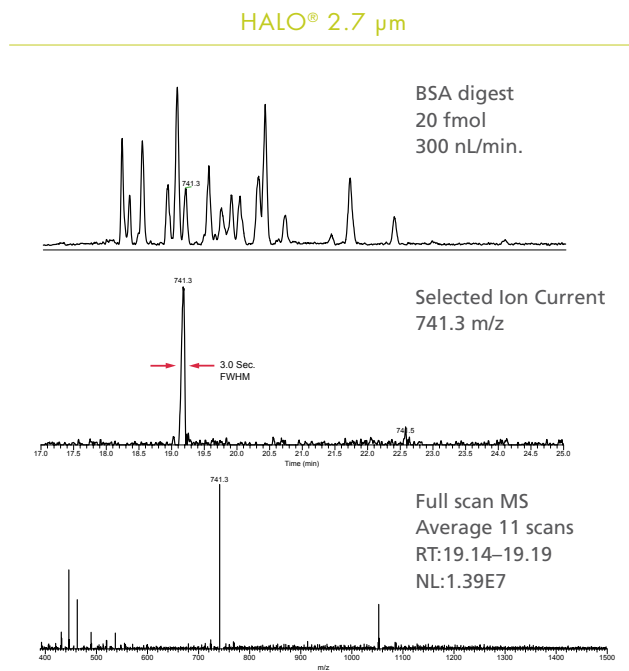
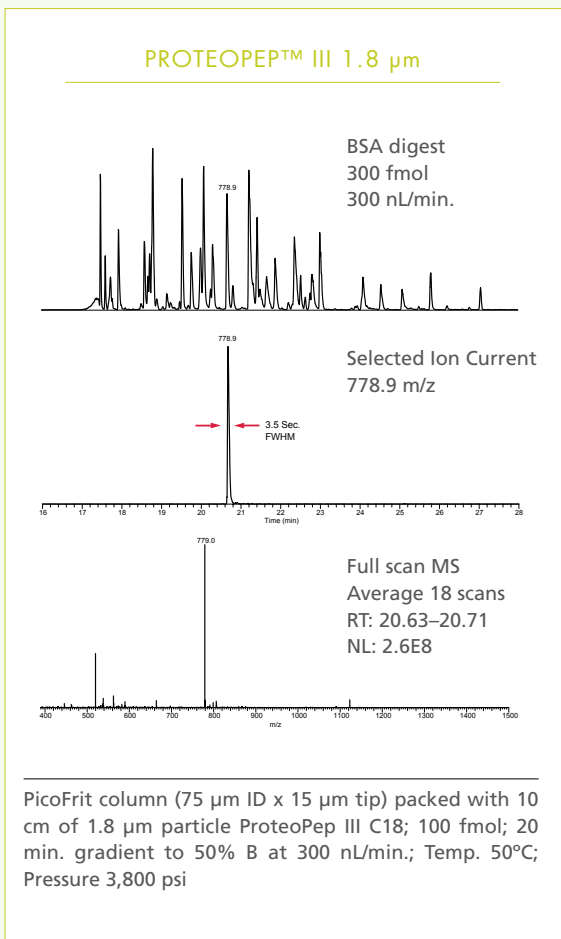
Matching trap and analytical column sorbents results in improved peak resolution, higher overall loading capacity, and improved peptide recovery

## Make your old mass spectrometer a high-performance mass spectrometer

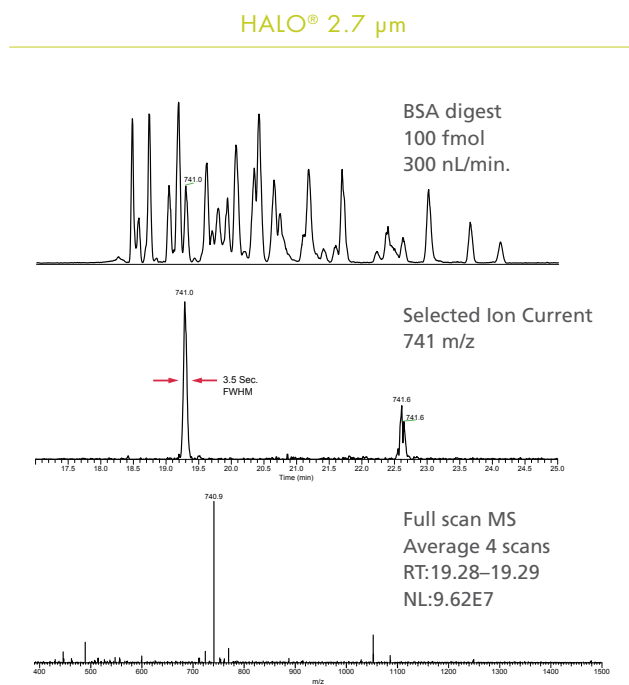
Using the PicoFrit® format means that even a 15-year-old LCQ Deca™ mass spectrometer, coupled to a direct-flow nanobore LC, can produce femtomole-sensitivity.

### UHPLC Performance in a Pico-Package

PicoChip and PicoFrit columns are the perfect format for fast-gradient chromatography. Packed with any of our sub-3 µm particle sorbents, they deliver ultra-high-performance results every time.



PicoFrit column (75 µm ID x 15 µm tip) packed with 10 cm of 2.7 µm particle HALO C18; 20 fmol; 13 min. gradient to 50% B at 300 nL/min.; Temp. 25°C; Pressure: 2,100 psi.



PicoFrit column (75 µm ID x 15 µm tip) packed with 10 cm of 2.7 µm particle HALO C18; 100 fmol; 13 min. gradient to 50% B at 300 nL/min.; Temp. 25°C; Pressure: 2,100 psi.

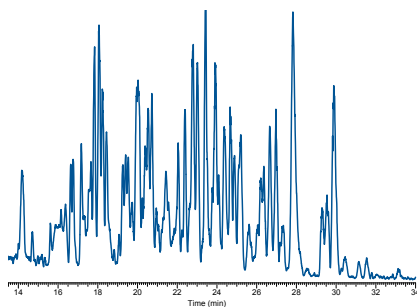
## New Objective Premier Media

Select the chemistry for your PicoChip<sup>®</sup>, PicoFrit<sup>®</sup>, IntegraFrit<sup>™</sup> columns or traps that will best suit your application. We have a wide range of sorbent options including our own premier ProteoPep<sup>™</sup> brand media.

### REPOSIL-PUR C18 AQ

This highly stable C18 from Dr. Maisch produces very sharp peaks and delivers the high-performance normally associated with much longer columns—even at 100% aqueous. Ideal for nearly all sample types, with great pH stability.

- C18, 120Å & 200Å
- Carbon load: 15%
- pH range: 1 -10
- Encapped, USP L1
- Particle size: 3 µm
- Excellent peak shape
- Ultra-pure silica

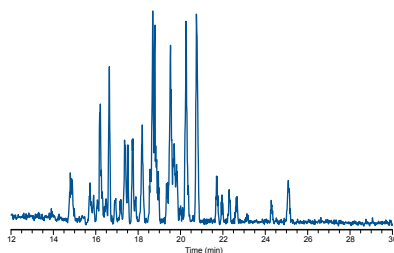


PicoChip column packed with 10.5 cm of 3 µm RepoSil-Pur C18 AQ; 50 fmol 6 bovine protein digest equal molar mix, 300 nL/min.; gradient: 2% B to 50% B over 30 min.

### PROTEOPEP<sup>™</sup> II

Our premier in-house sorbent, ProteoPep<sup>™</sup> II produces sharper peaks with less noise compared to original ProteoPep. ProteoPep II supplies improved bonding and peptide recovery, making it the ideal choice for peptide mapping, purification, and high-peptide runs.

- C18, 300 Å
- Carbon load 6%
- Encapped, USP L1
- Particle size: 5 µm
- Synthetic peptide purification
- Excellent for both hydrophobic and hydrophilic peptides
- Exceptional peak shape with trace (0.005%) or no TFA

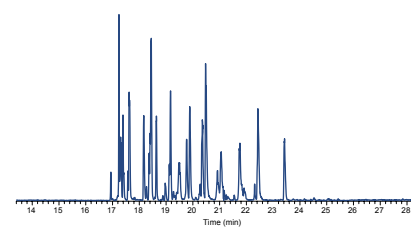


PicoFrit column packed with 5 cm of 5 µm ProteoPep II C18; 0.05 ng peptide sample injected; 300 nL/min.; gradient: 2% B to 50% B over 29 min.

### PROTEOPEP<sup>™</sup> III

Introducing, ProteoPep<sup>™</sup> III 1.8 µm high-performance media produces excellent analyses for acidic, basic, and neutral compounds. Double endcapping produces a highly deactivated stationary phase resulting in superior peak shape and high efficiency.

- C18, 80 Å
- pH range: 2-9
- Carbon load 10%
- Double encapped, USP L1
- Particle size: 1.8 µm
- Excellent for low-pH applications
- Fast, high-resolution results
- Low back pressures



A 100 fmol BSA digest analyzed using a PicoFrit column packed with 10 cm of 1.8 µm ProteoPep III C18 at 300 nL/min.; gradient of 20 min. to 50% B

**Don't see the chemistry you need?** Contact our technical support staff. We have additional chemistries available to meet your requirements. Or send us your chosen media and we'll professionally pack nanobore columns to your specification. We will reserve the remainder of your sorbent lot exclusively for your future needs.

PicoFrit emitters and columns, PicoChip, and IntegraFrit columns are manufactured under U.S. Patents 5,997,746, 6,190,559, and 6,395,183 and are sold for use under license of U.S. patent 5,572,023. Other patents pending. PicoClear sold under U.S. patent 7,681,929. Other patents pending.

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### online nanospray

Fused-silica PicoTip® emitters provide the highest performance and quality attainable for online nanospray. The SilicaTip™ features high-grade fused-silica tubing with precise shape and tip diameters and is an ideal choice for low flow and ultra-low flow methods. The TaperTip™ is the standard choice for microspray applications with flow rates ranging from 0.2 to 3.0 µL/min.

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### offline nanospray

Precision-crafted PicoTip emitters are also ideal for offline nanospray applications. Borosilicate GlassTips™, EconoTips™, and specialized QuartzTips™ offer the most rugged, most reliable and most reproducible nanospray performance for offline applications.

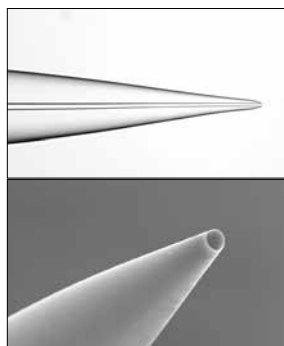




## Online Nanospray Analysis

SilicaTips and TaperTips represent the highest performing and most versatile nanospray emitters available. Each emitter requires mounting hardware that can accommodate 150 or 360  $\mu\text{m}$  outside diameter (OD) fused-silica tubing. The SilicaTip is manufactured from the highest-grade fused-silica tubing and is pulled to precise dimensions. Stringent internal taper shape and tip opening parameters are critical for low-flow and ultra-low flow rate delivery; <math>10\text{ nL/min}</math>.

The TaperTip is an extremely robust emitter and is popular for use in higher nanospray flow rates. A TaperTip has no internal taper, and therefore, is an ideal choice for applications where clogging may be an issue.



### SILICATIP™

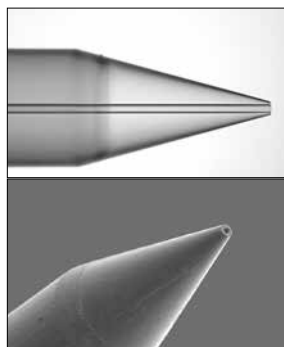
SilicaTip emitters are capable of hundreds of hours of continuous operation (more than 800 hours with MeOH/water/acetic acid mobile phase) without a loss of coating. These emitters are engineered for continuous-flow nanospray in a 20-1,000 nL/min. range. Each SilicaTip must pass rigorous video inspections and conform to stringent specifications to ensure we deliver the highest performance nanospray emitter.

- Consistent, sustainable, high-performance spray
- Ideal for low-flow and ultra-low flow applications
- Wide selection of IDs, tip sizes, and lengths for nearly all applications
- Multiple coating options for high-voltage application
- Custom sizes available to fit any mass spectrometer platform



### FRITTED SILICATIP™

A fritted SilicaTip provides a nanospray emitter that is virtually clog-free. The fritted SilicaTip is a popular choice when the application demands cleanliness within the fluid path as well as high-performance sample preparation methods.



### TAPERTIP™

Fused-silica TaperTip emitters are engineered and designed for microspray flow rates (0.2 to 3.0  $\mu\text{L}/\text{min.}$ ) As with the SilicaTip nanospray emitters, each TaperTip undergoes a rigorous video inspection protocol, resulting in the highest performance nanospray emitter.

- Microspray flow rate applications (0.2 to 3.0  $\mu\text{L}/\text{min.}$ )
- External taper only
- Virtual clog-free operation
- Rugged, reliable, and reproducible performance
- Choose from a variety of sizes and formats to meet specific needs
- Multiple coating options for high-voltage application



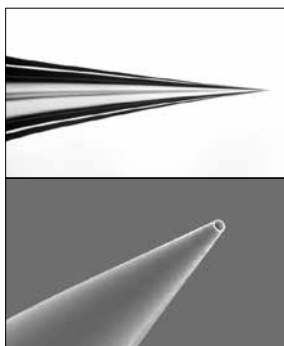
### METAL TAPERTIP™

Each stainless-steel TaperTip is precision trimmed and polished. The TaperTip is engineered and designed to be extremely durable and can last many months. TaperTip nanospray emitters are easily inserted into a microsleeve to enable use with systems that require 360  $\mu\text{m}$  OD sizes. The TaperTip nanospray emitter is a low-flow workhorse!

- Outstanding ruggedness and reliable performance (>1,000 hrs.)
- Accommodates a wide flow range: 0.2 - 3.0  $\mu\text{L}/\text{min.}$
- Stable and reliable spray features
- No internal taper means virtually clog-free operation
- Reusable. Reusable. Reusable.

## Offline Nanospray Analysis

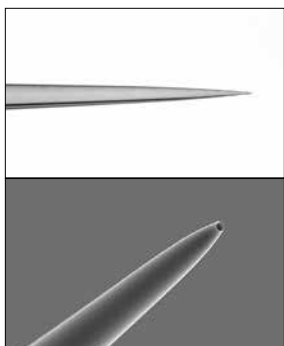
GlassTips™, QuartzTips™, and EconoTips™ provide the most sensitive and versatile ensemble of nanospray emitters for offline applications. These high performance nanospray emitters are manufactured using the highest-grade borosilicate glass or quartz. Each nanospray emitter features a specially engineered bore filament that allows for self-filling. The unique, precision-made tip opening eliminates the need to break open tips prior to use.



### GLASSTIP™

GlassTips are the easiest way to ensure a rugged, reproducible sample delivery method for nanospray. Precision engineered with borosilicate glass to meet strict specifications, GlassTips are ready for use right out of the box - no breaking required.

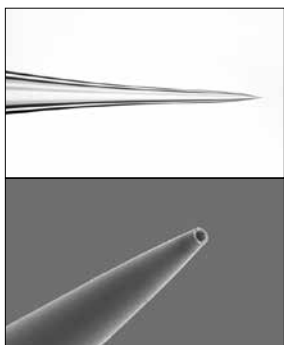
- Rigorous video inspections to conform to stringent specifications
- Available with a durable, inert, multi-layer coating
- No breaking required!
- Easy, self-filling



### QUARTZTIP™

Specialized QuartzTips are the perfect nanospray emitter for work with large proteins and DNA. QuartzTips are manufactured with significantly lower sodium content to provide an extremely stable and reliable platform for nanospray and sample delivery.

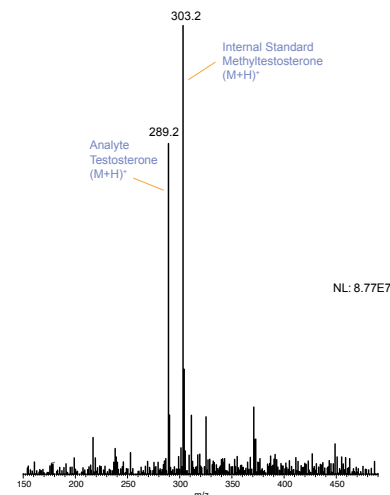
- Reduced sodium contamination
- Widely used for applications with large proteins and DNA



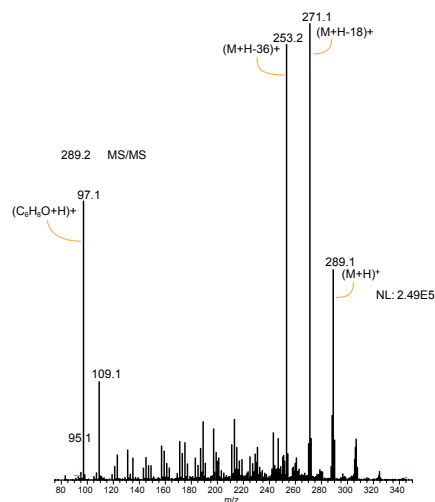
### ECONOTIP™

EconoTips provide an attractive solution when durability and cost are concerns. EconoTips feature a 1 μm tip ID and combine both durability and reproducibility with the highest standards of quality.

- Attractive choice for routine sample sets
- Available with standard, single layer conductive coating
- No breaking required



Mass spectrum of testosterone with methyltestosterone (IS) taken with GlassTip, 1.2 mm OD x 0.69 mm ID x 2 μm tip



MS/MS of testosterone (M+H)<sup>+</sup> taken with GlassTip, 1.2 mm OD x 0.69 mm ID x 2 μm tip



GlassTip with a 1.2 mm OD, 0.69 mm ID, and 2 μm tip spraying at 60 nL/min.

## Selecting the Right Emitter

### STEP 1

#### ONLINE OR OFFLINE ANALYSIS

Sometimes the desired flow rate determines the best nanospray format and emitter; Sometimes the available sample volume is most critical. Need more help? Call us at 781 933 9560. We'll help you get started!

PUMPED VOLUME	SAMPLE VOLUME	TIP ID	FLOW RATE	METHOD
Yes	<0.1 > 10 $\mu\text{L}$ (1 – 5 $\mu\text{L}$ typical)	2 – 50 $\mu\text{m}$ (5 – 15 $\mu\text{m}$ typical)	100 nL – 1 $\mu\text{L}/\text{min.}$ (1 – 5 $\mu\text{L}$ typical)	Online
No	0.1 – 5 $\mu\text{L}$ (1 $\mu\text{L}$ typical)	1 – 4 $\mu\text{m}$ (1 $\mu\text{L}$ typical)	10 – 80 nL/min. (25 $\mu\text{L}$ typical)	Offline

### STEP 2

#### TARGET FLOW RATE

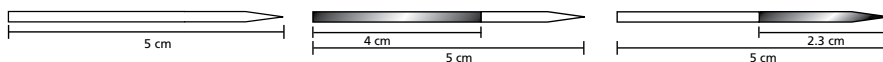
Nanospray emitter ID and tip opening play important roles in controlling the flow rate. The smaller the tip opening, the lower the flow rate – and the greater the risk of clogging.

SILICATIPS™		TAPERTIPS™		GLASSTIPS™	
TIP ID	FLOW RATE (nL/min.)	TIP ID	FLOW RATE ( $\mu\text{L}/\text{min.}$ )	TIP ID	FLOW RATE (nL/min.)
5	30 – 200	20	0.2 – 0.5	1	20 – 80
8	50 – 300	50	0.2 – 1.0	2	20 – 80
10	100 – 400	75	0.3 – 2.0	4	40 – 100
15	150 – 400	100	0.4 – 3.0		
30	300 – 1,000				

### STEP 3

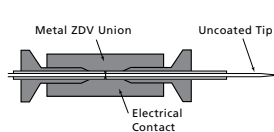
#### SELECT THE RIGHT COATING STYLE

Electrical contact with the nanospray emitter is essential. A wide selection of coatings provide the optimum electrical contact for nearly all mass spectrometers.



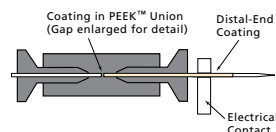
#### JUNCTION CONTACT (UNCOATED)

The electrical contact is made to the union holding the emitter. PicoTips that are uncoated have -N- in their part numbers. The voltage travels back the emitter and passes to the mobile phase in the gap between the emitter and the transfer line.



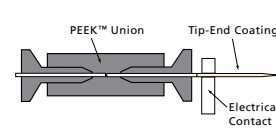
#### DISTAL CONTACT (DISTAL)

The electrical contact is provided to the outside of the emitter, which has a conductive coating on the distal (back) end. Distal-coated PicoTips have -D- in their part numbers. Voltage contacts the mobile phase via the gap between the emitter and the transfer tubing.



#### TIP CONTACT (STANDARD)

The electrical contact is made to the outside of the tip. PicoTips with a standard coating have -CE- in their part numbers. The emitter has a conductive coating to the tip where the voltage contacts the mobile phase.



### STEP 4

#### DETERMINE YOUR EMITTER LENGTH FOR ONLINE ANALYSIS

The length of the nanospray emitter is often dependent on the requirements of the nanospray source. PicoTip® emitters feature a standard length of 5 cm, though we also offer lengths for most mass spectrometer sources. Need a custom length? A different size? Give us a call. We can customize PicoTip emitters to suit your specific needs.

**Hate cleaving fused silica? Try our pre-cut emitters and tubing!**



## Useful Tools

### DIAMOND SCRIBE



This precision, 90° wedge-style (1 mm-wide blade) diamond scribe is different from most diamond point scribes available elsewhere. With proper technique, this scribe can be used to cleave even thin-wall tubing without damage to the tubing and with minimum particulate generation.

Part Number: SCRIBE

### MICRO TOOL KIT



Tool assortment for low-volume preparative work. These high-quality tools are the same as those used in the New Objective lab. Includes Dumont #7 fine forceps, Dumont #578A forceps, 90° precision diamond scribe, needle probe for swaging sleeves, and a 6" metal ruler (inch/mm).

Part Number: TIP-KIT

### GELOADER™ TIPS



Flexible 350 µm OD gel-loading pipette tip, makes offline PicoTips® sample loading fast and simple.

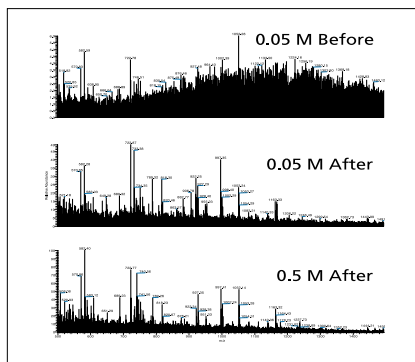
Part Number: NO22351656 (192 pieces)

### TRAP'n TIP™ SAMPLE PREP TIPS



Ready-to-use pipette tips for de-salting, concentrating, and separation of samples for offline LC-MS, Trap'nTips are disposable chromatography and sample preparation micropipette tips that attach to your 10 µL pipette. The sample is loaded directly from the Trap'nTip into the emitter, making them ideal for offline/static nanospray.

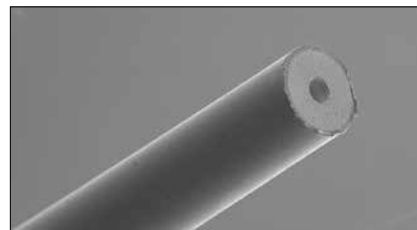
- One-time use
- Excellent sensitivity
- High reproducibility – reliable methods and superb ease-of-use
- High throughput – load, wash, and elute without high pressure



Part Numbers:

NOTNTC18	C18	Box of 96
NOTNTCAR	Carbon	Box of 96
NOTNTMC18	C18/Carbon	Box of 96
NOTNTTI	Titanium	Box of 96
NOTNTZR	Zirconium	Box of 96

### PRE-CUT FUSED-SILICA TUBING



Simplify and improve your analysis with pre-cut fused-silica tubing. No more cleaving and hoping for a clean connection. Pre-cut tubing is professionally cut and polished to guarantee the best connection. 360 µm OD tubing is available in four ID sizes and five lengths.

### FITTINGS KIT



Everything you need for connecting fused-silica tubing with conventional HPLC hardware, and injection syringes. Includes Upchurch® fittings, sleeves, microfilter, filter cap, and unions, tubing adapters, and 2m each of 4 different IDs of fused-silica tubing, each 360 µm OD.

Part Number: FSFK-2

### PICOCLEAR™ UNION



Sleeveless ZDV union for use with 360 µm fused-silica tubing. Visible junction and perfectly aligned throughbores, compatible with HPLC at high-pressures.

Part Number: PCU-360 for 360µm tubing

“This [Digital PicoView 550] is  
the most stable, robust nanospray  
set-up I have ever had.”

Reid Townsend, Ph.D., M.D.

---

### total control

The highest sensitivity and control is achieved with PicoView® nanospray sources. The platform accommodates flow rates from <10 nL/min. to >10 µL/min. either online or offline.

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### infinite control

Go digital and eliminate the need for manual, trial-and-error adjustment of emitter position and voltage! Digital PicoView® nanospray sources provide unparalleled control and flexibility for the highest performance.

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## Benefits

The ultimate performance nanospray source for methods requiring flexibility and control. PicoView® nanospray sources are engineered to provide maximum capabilities for a wide range of challenging applications.

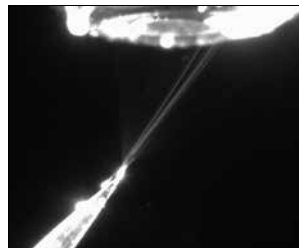
- Magnetic interlock stage plate allows easy emitter removal or adjustment without the use of tools
- Versatile tip-mounting option allows for junction or tip-style high-voltage contact
- Fully compatible with all PicoTip® emitters and PicoFrit® columns
- Imaging system with visual or video imaging lets user see the tip and spray for easy tuning and troubleshooting
- Modular stage plate is user-configurable for multiple applications, with controllable tip angle for optimum signal
- High-precision, ball-bearing XYZ stage for exact positioning
- Universal valve mount for manual or automatic valves positioned close to the emitter to minimize system-wide swept volume

PicoView nanospray sources are designed for scientists by scientists. Standard PicoView models allow full control over all experimental details from tip angle and voltage application methods to online or offline analysis. PicoView affords a simple and effective solution for high performance and high productivity.

The hallmark of the PicoView platform is high-performance nanospray via the novel spray imaging system. Spray visualization and validation translate into high sensitivity, greater reproducibility, and increased productivity.



**Droplet formation**  
Spray voltage too low



**Jet Spray**  
Spray voltage too low



**Perfect Plume**  
Spray voltage is optimal

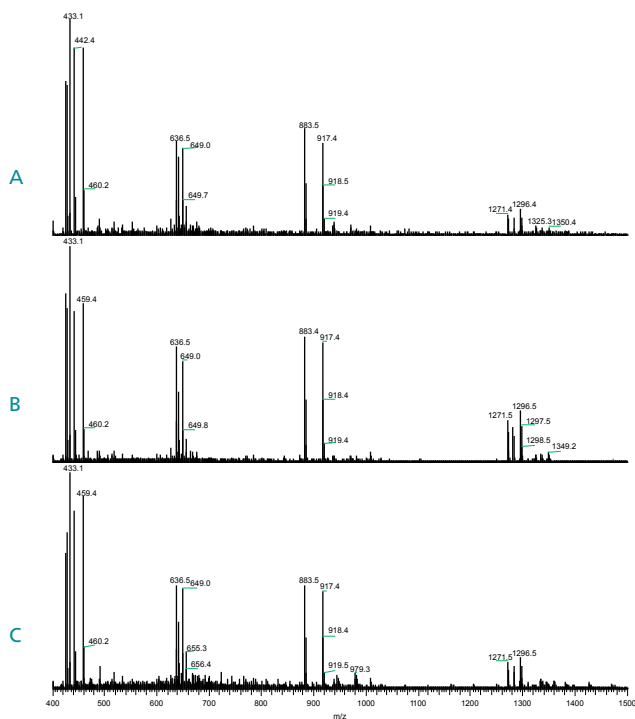


**Split-Spray**  
Spray voltage too high

## Flexibility and Results.

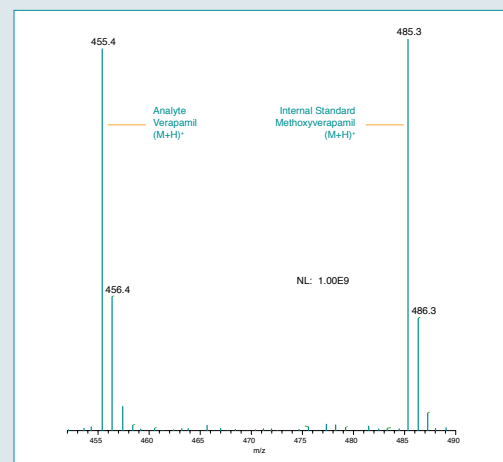
### CONCENTRATION-DEPENDENT SENSITIVITY

Flow rate comparison for a 5-peptide mix: A) Spectra for 500 nL/min. constant flow rate; B) Spectra for 50nL/min. constant flow rate; C) Intermediate flow rate.

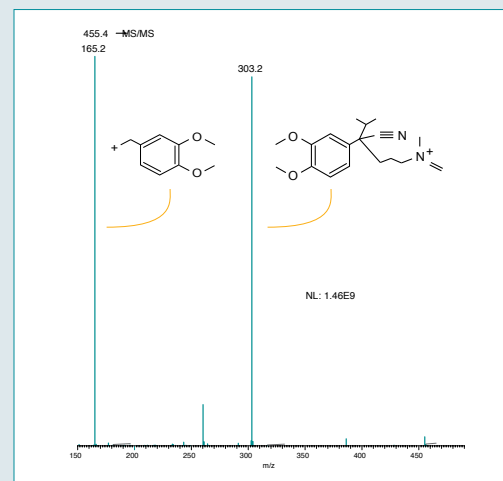


### SMALL MOLECULE ANALYSIS

Offline analysis of canine plasma-spiked standard containing small-molecule analyte.



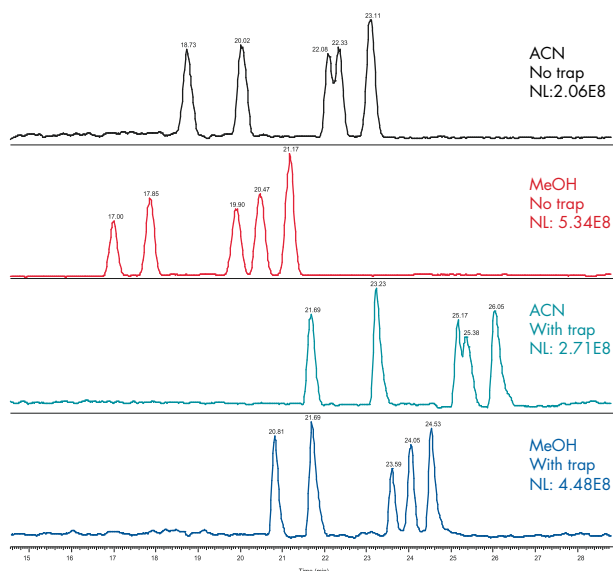
Mass spectrum of verapamil with methoxyverapamil (IS)



MS/MS of verapamil (M+H)<sup>+</sup>

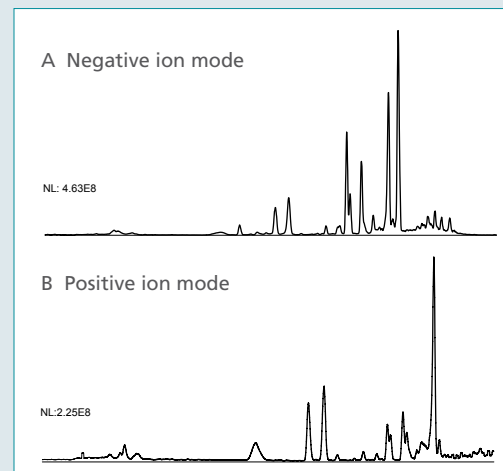
### RAPID METHOD DEVELOPMENT: METHANOL vs. ACETONITRILE

For a 5-component angiotensin sample, methanol yielded superior performance with enhanced MS S/N ratios and peak intensities. Below, base peak chromatogram of 5-angiotensin test mixture using a PicoFrit® column containing 10 cm of ProteoPep™ II C18.



### VARIABLE ION MODE

Base-peak chromatograms of  $\beta$ -casein digest with PicoFrit columns containing 10 cm of ProteoPep II C18.





#### HIGH-RESOLUTION TIP & SPRAY IMAGING

50x-200x System magnification provides optimal viewing of your emitter on the high-resolution video monitor for easy tuning and troubleshooting. The high-quality video camera is easily positioned and focused with fine-positioning knob-driven controls.



#### JUNCTION OR TIP CONTACT

Whether you need to establish a high-voltage liquid junction contact with the voltage-ready microtee, or apply voltage to your analyte through the conductive coating on a SilicaTip™, or even need to calibrate your system using offline GlassTips™, PicoView® easily accommodates all styles of voltage application.



#### TOOL-FREE MAGNETIC STAGE

Change emitters or modify your experiment out of the box quickly and easily — no screws or clamps and no tools required. The magnetic interlock stage snaps back into place easily and with minimal reoptimization. With an additional stage, setup a second experiment while the first is running.



#### MINIMIZE SWEPT VOLUME

PicoView sources provide an optional integrated valve mount to help keep system swept volume as low as possible. Component arms organize plumbing, trap, and guard columns for quick and efficient setup and modification.

## PICOVIEW® MODELS

### PV-550

For Thermo Fisher LTQ/FT, Orbitrap, Q Exactive, Velos and Deca XP Max



### PV-500

For Thermo Fisher LCQ Deca XP and XP Plus



### PV-450

For AB SCIEX 4000, 5500, and 5600



### PV-150

For Thermo Fisher LCQ Deca and LCQ Classic





## Infinite Control

The Digital PicoView® nanospray source provides a new level of high performance. This platform integrates a digitally-controlled tip positioning and rinsing system with the tool-free set up and comprehensive hardware benefits of the PicoView platform.



**Model DPV-550**  
For Thermo LTQ/FT, Velos, Orbitrap, and Q Exactive

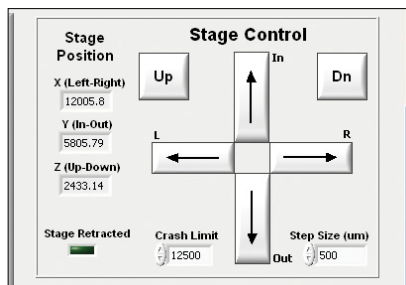
- Digitally-controlled tip positioning
- High-resolution digital imaging
- Stage position save and recall
- Fully-automated tip rinsing station
- Increased efficiency and throughput
- Tool-free magnetic stage
- Perform offline and online analyses
- Wide flow-rate range:  
<10 nL/min. to >10 µL/min.

### HIGH-RESOLUTION DIGITAL IMAGING



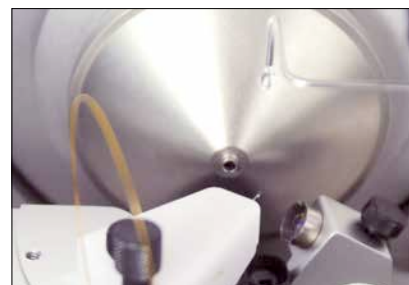
The USB-driven camera provides a high-resolution image directly to the mass spectrometer. This superior digital image is fundamental for spray optimization, method development, and diagnostic troubleshooting.

### DIGITAL STAGE POSITIONING



Control stage positioning with the PV Acquire software. The intuitive interface eliminates any concern with the accurate recall of tip position. Precise tip positioning with micrometer accuracy affords the highest possible control for optimal spray delivery. Tip positions are easily saved and recalled to reduce time spent on optimization and boost productivity.

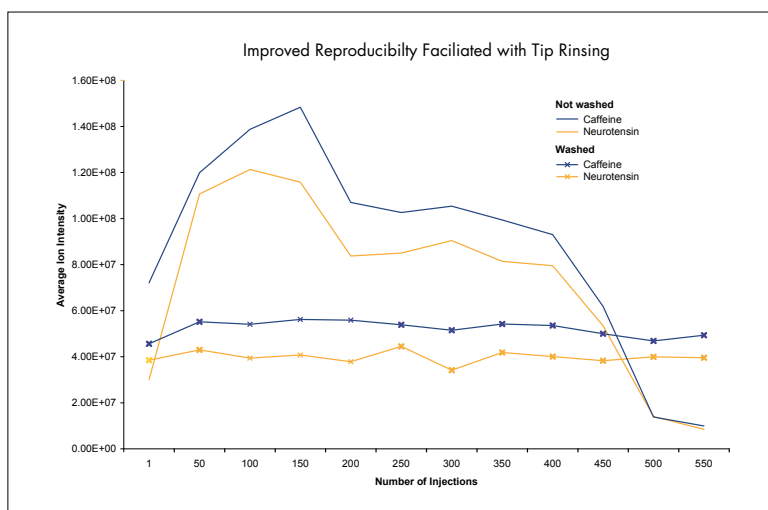
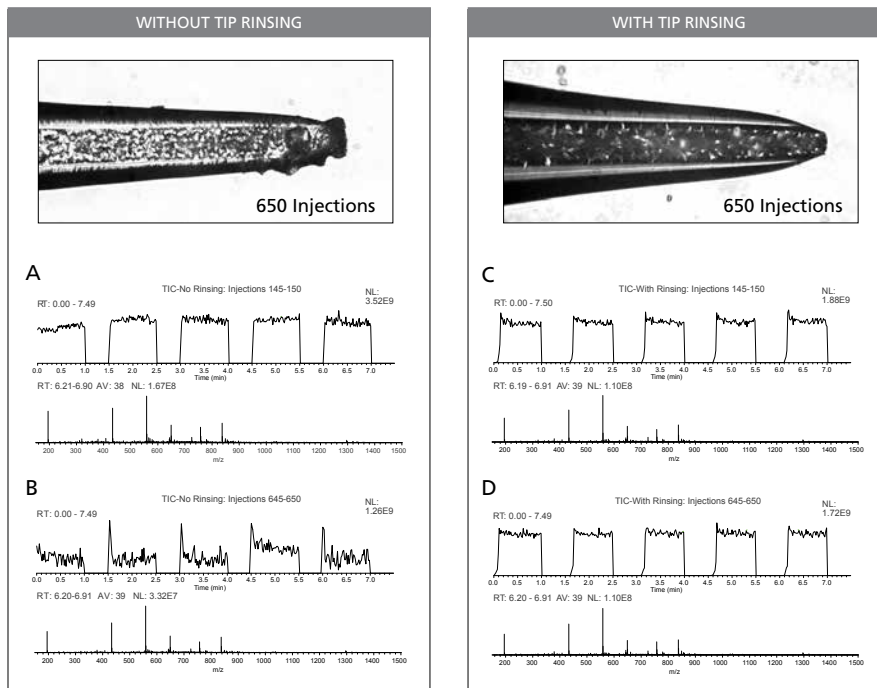
### FULLY-AUTOMATED TIP RINSING



Keeping the PicoTip nanospray emitter clean can significantly extend its lifetime and provide high performance results throughout the study. The Digital PicoView nanospray source features a dedicated Rinse Station with Digital Divert to automatically rinse and clean.

### AUTOMATED TIP RINSING

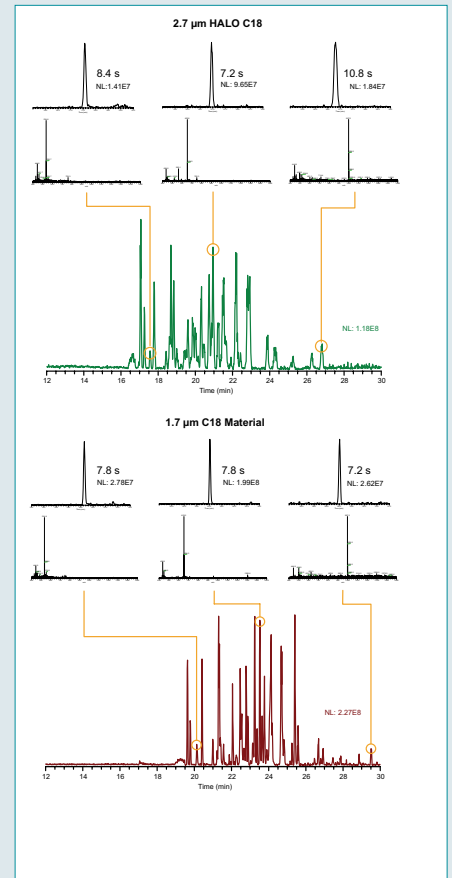
The TICs and summed full-scan spectra shown at right were obtained from a canine-plasma sample spiked with a standard; one with tip washing and without. Injections 145–150 show similar TICs (A and C). After 645 injections, an overall intensity decrease is apparent and the degradation in stability is indicated by the jaggedness of the TIC (B). Contrary to this change in TIC between injections 145 – 150 and 645 – 650 for data collected with no tip washing, Panel D shows the TIC for injections 645 – 650 for data collected with tip washing. The TIC in Panel D is identical to the TIC in Panel C. Regular washing of the emitter exterior has maintained the intensity and stability of the TIC throughout the duration of the experiment while the intensity decreased from injection 150 to injection 650 with no tip washing.



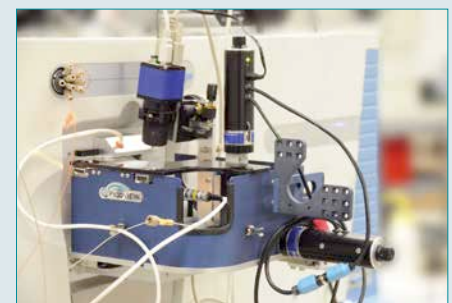
Comparative data plot of Average Intensity per injection for two ions, Neurotensin MH<sub>2</sub><sup>+</sup> at 837.2 Da and Caffeine MH<sup>+</sup> at 195.2 Da. The change in average intensity for each ion over multiple injections is dramatically different for the data set collected with washing versus the data set collected with no washing. The signal intensity collected with emitter washing is highly reproducible whereas the signal intensity with no emitter washing exhibits dramatic fluctuation. With no emitter rinsing, the decrease in intensity per injection indicates that eventually the value will go to zero.

### RAPID METHOD DEVELOPMENT

Rapid method development is facilitated with the PicoView® unique magnetic-stage design. The no-tool interface makes column-switching quick and simple.



The data above compare two different PicoFrit columns in the analysis of a 100 fmol BSA digest

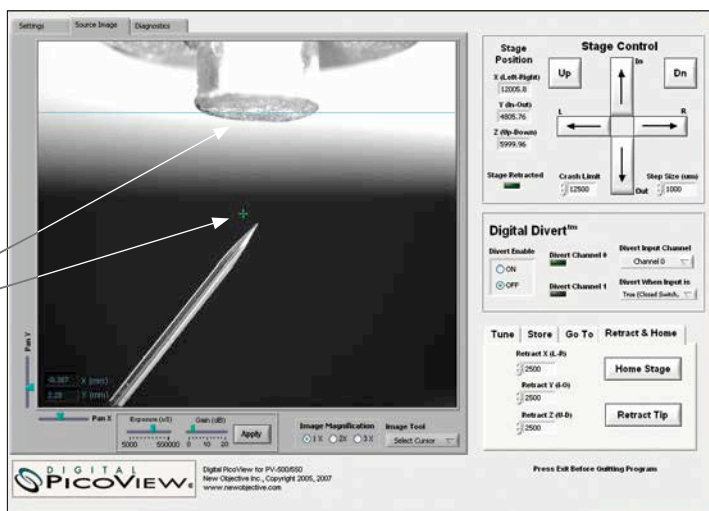


DPV-550 in use on the Thermo LTQ



## Software: PV Acquire™

PV Acquire™ is a powerful user interface for Digital PicoView®. The software is controlled by the mass spectrometer and enables rapid spray optimization in concert with the signal output obtained from the mass spectrometer.



**Main Window**  
Settings  
Source Image  
Diagnostics  
Tabs

**Measurement Cursors**  
Blue - Inlet  
Green - Emitter

**Cursor Indices**

**Image Controls**

**Stage Control Panel**

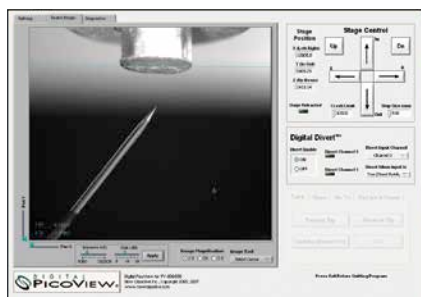
**Digital Divert™ Panel**

**Mode Panel**  
Tune  
Store  
Go To  
Retract & Home



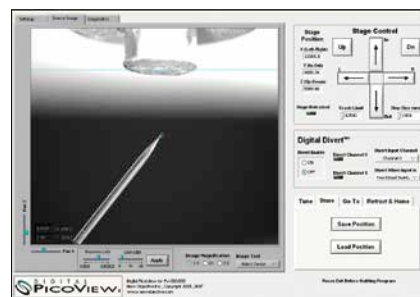
### ON-SCREEN POSITIONING

On-screen emitter positioning is a specially designed feature for the Digital PicoView nanospray source and provides an easy way to establish the X and Y coordinates for rapid and accurate tip positioning.



### DIGITAL DIVERT™

The Digital Divert function allows the LC or mass spectrometer to control tip repositioning. This feature is essential for the tip rinsing applications and automatically positions the emitter tip away from the inlet in between runs.



### STORE & LOAD

Emitter positions can now be saved with a date and time stamp or user-defined file name. Choose from a library of emitter positions from the pop-up menu and the emitter is repositioned to the exact coordinates.

## DIGITAL PICOVIEW® MODELS



### DPV-150

For Thermo Fisher LCQ Deca™, Classic™ and Advantage™

### DPV-550

For Thermo Fisher LTQ™/FT, Orbitrap™, Velos®, Q Exactive® and Deca XP Max™

### DPV-400

For AB SCIEX QSTAR® and API 3000

### DPV-450

For AB SCIEX 4000 QTrap®, 5500 QTrap®, and 5600 TripleTOF®

Digital PicoView is manufactured and sold under U.S. Patents 5,572,023, 6,977,372 and 6,744,046. Specifications subject to change without notice.

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New Objective, Inc.      888 220 2998 U.S. Orders  
Two Constitution Way      781 933 9560 Phone  
Woburn, MA 01810-1023      781 933 9564 Fax

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