

[ XEVO TQ-S ]

STEP UP TO THE CHALLENGE WITH  
A STEP CHANGE IN SENSITIVITY



TQ-S

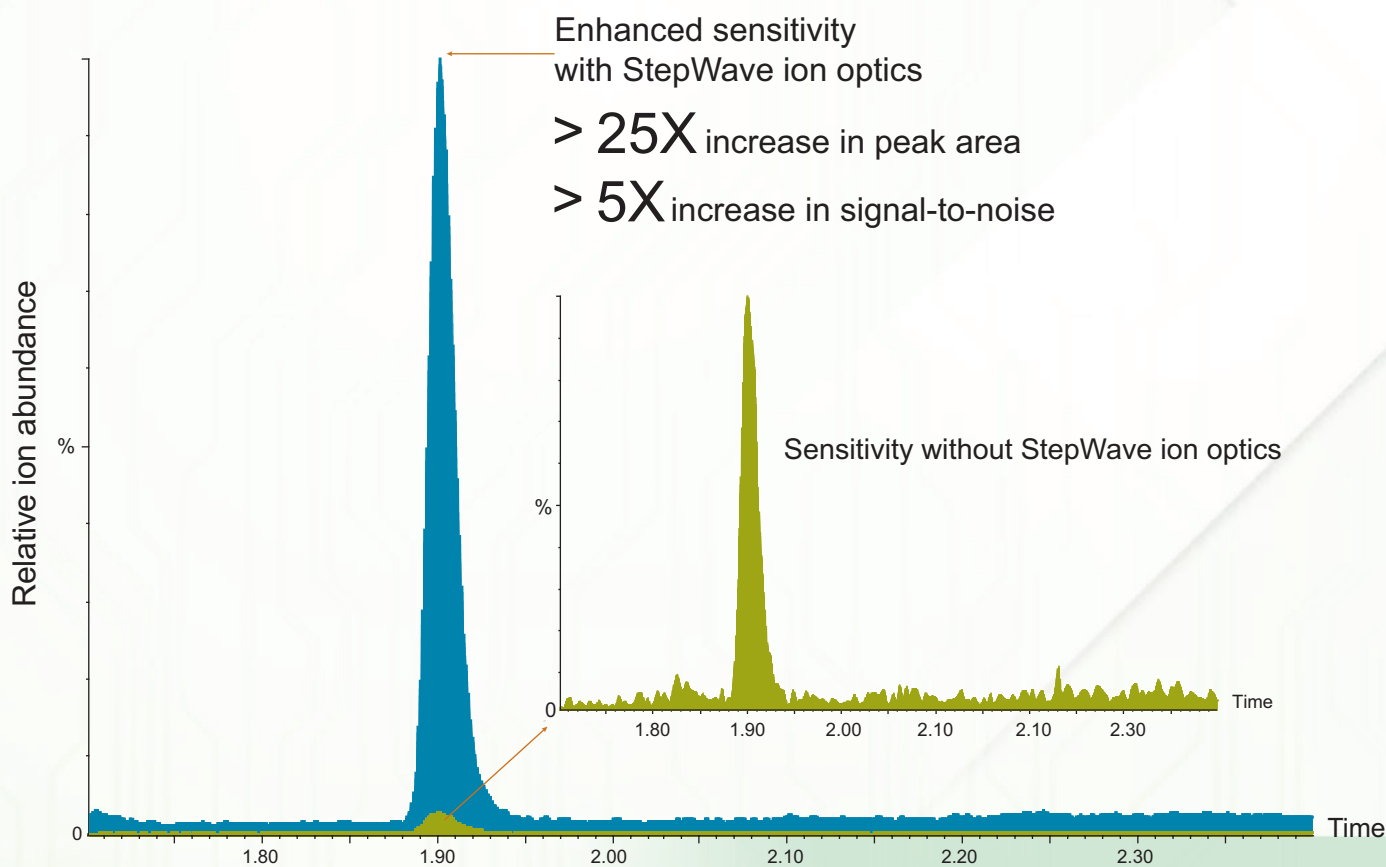
**Waters**  
THE SCIENCE OF WHAT'S POSSIBLE.®

# Xevo TQ-S

## WHEN YOU NEED A SYSTEM THAT IS **MORE THAN SENSITIVE**

Now you can quantify compounds at concentrations lower than you ever thought possible. This step change in sensitivity delivers the highest-quality, most comprehensive information — so you can consider quantification studies that were previously beyond your reach.

### UPLC/MRM 50 fg Reserpine ESI+



Thanks to a revolutionary off-axis ion source technology known as StepWave™ Xevo® TQ-S delivers unprecedented levels of sensitivity, selectivity, and accuracy.

All Xevo TQ systems are designed for quantitative UPLC®/MS/MS applications. With the increased sensitivity of the Xevo TQ-S, you can quantify and confirm trace components at even lower levels in the most complex samples.

Best of all, Xevo systems allow you to achieve your goals with unparalleled speed and ease.

With Xevo TQ-S, suddenly your laboratory will develop methods to advance biological and medical research, bring drugs to market faster, identify a broader array of food or environmental contaminants, or report reliable forensic data with total confidence.

### Innovative features for impressive results



ACQUITY UPLC System with Xevo TQ-S Mass Spectrometer

## ENGINEERED SIMPLICITY

The combination of highest performance with system versatility and simplicity of operation.

### High Performance

**StepWave™:** Revolutionary off-axis ion source technology that removes neutral molecules, reducing noise and providing robust performance.

**ScanWave™:** Innovative technology that provides rapid, high-quality, UPLC-compatible, MS/MS data acquisition.

**RADAR™:** Using simultaneous quantitative and qualitative data acquisition it is possible to understand sample complexity, enabling intelligent method development while accurately quantifying target compounds with no compromise on performance.

### Versatility

**Ion sources:** Versatility of an extensive range of interface capabilities to service the broadest range of applications.

### Simplicity of Operation

The accessibility of Engineered Simplicity™ guarantees maximum system performance and usability – as well as superior support to ensure your continued success.

# STEP WAVE™

## ULTIMATE SENSITIVITY IN ALL ACQUISITION MODES

### Step up to your analytical challenges with StepWave

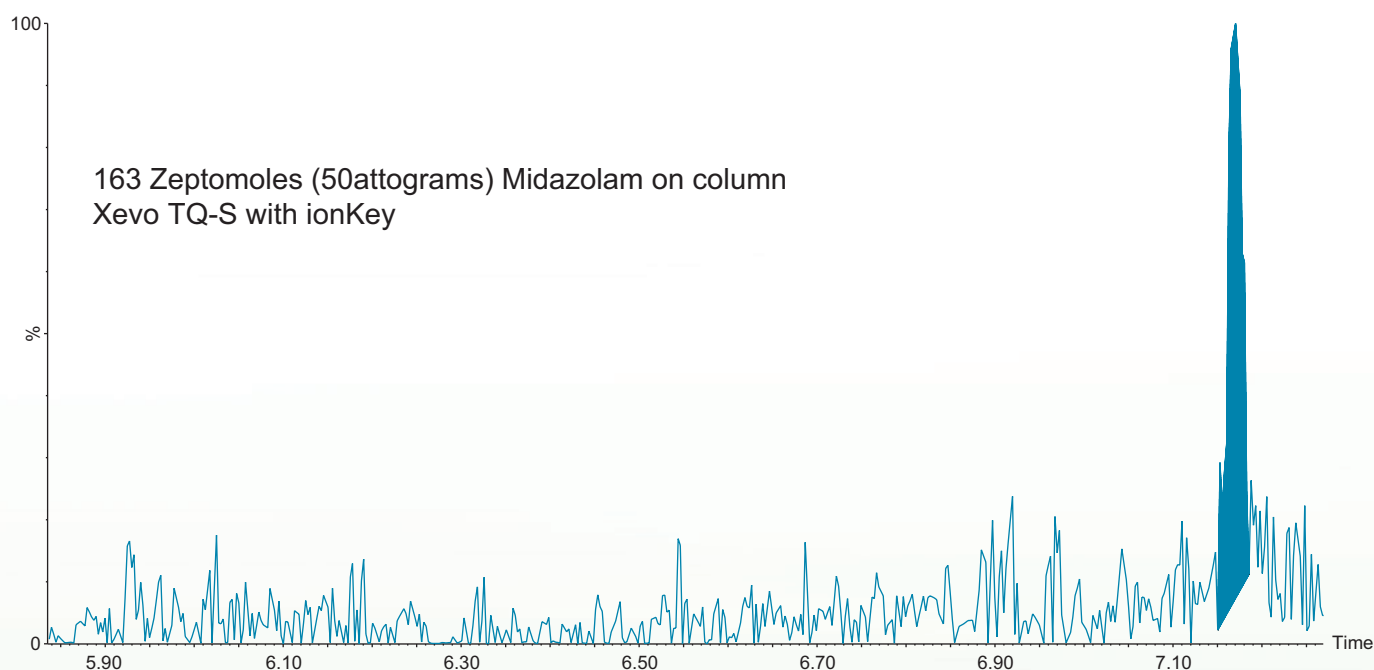
Specifically designed to maximize sensitivity in all data acquisition modes, Xevo TQ-S is equipped with a larger ion sampling orifice, an enhanced vacuum pumping configuration, and revolutionary StepWave ion transfer optics.

With the sensitivity of Xevo TQ-S, now you can:

- Detect target compounds in complex samples at the very lowest concentrations
- Dilute samples to reduce matrix effects
- Work with smaller sample volumes

In the end, it means you can detect compounds you may never have been able to detect before.

This groundbreaking design transfers ions from the ion source to the quadrupole MS analyzer with the highest possible efficiency, at the same time ensuring undesirable neutral contaminants are actively filtered out. This dramatically increases MS ion intensities while minimizing background noise – for more confidence in the repeatability of your assay.



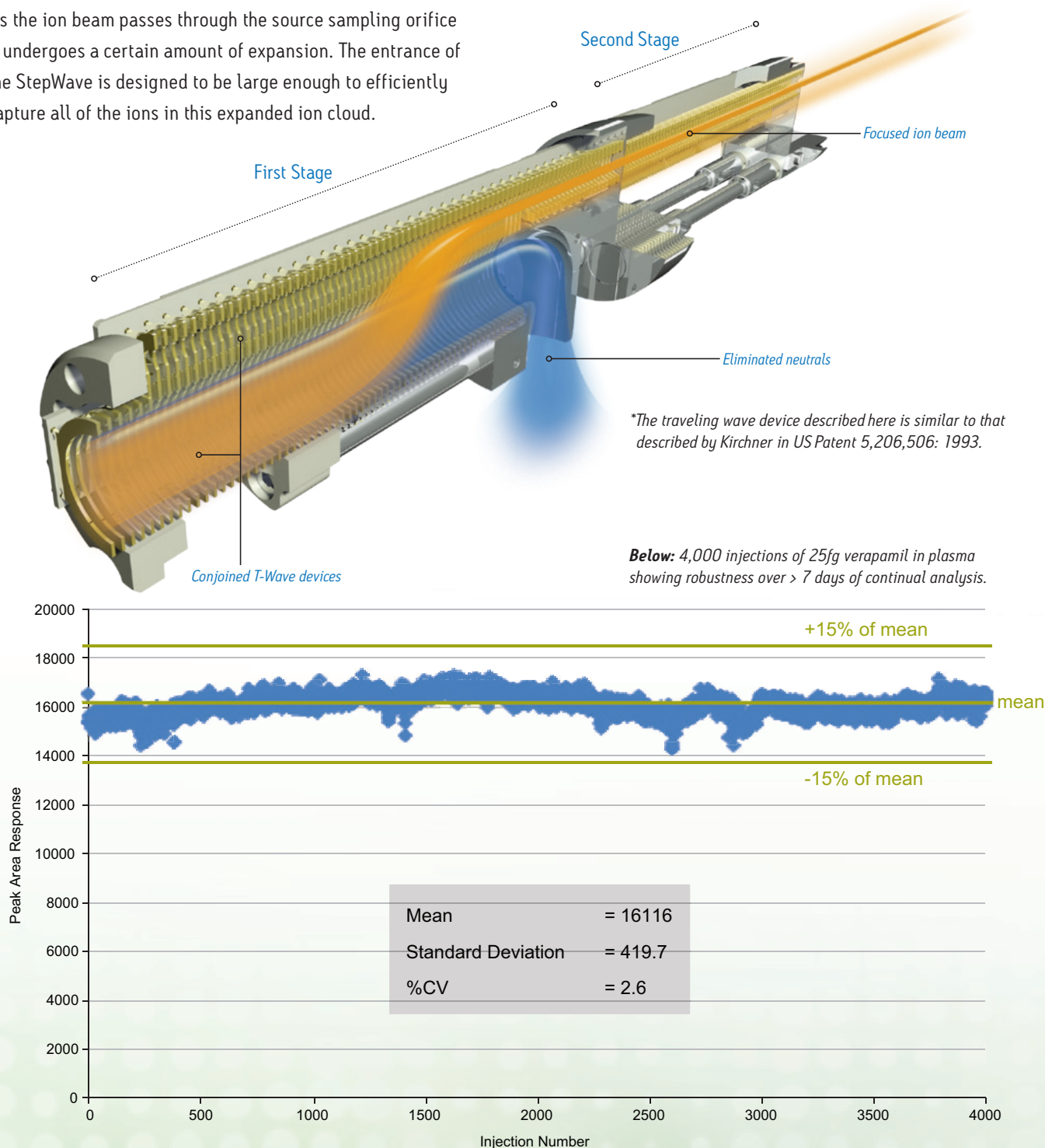


## One giant step for science

The patented StepWave consists of two ion transfer stages both of which are T-Wave™\* enabled. The first stage is revolutionary in its design, constructed from two stacked ring electrode devices that are conjoined to give a single off-axis ion transfer lens with unique properties.

As the ion beam passes through the source sampling orifice it undergoes a certain amount of expansion. The entrance of the StepWave is designed to be large enough to efficiently capture all of the ions in this expanded ion cloud.

The design of the first stage ensures that all the ions are efficiently focused and directed up into the second stage. The unique off-axis design ensures that any neutral materials entering the source sampling orifice are actively extracted from the system.



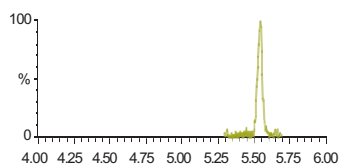
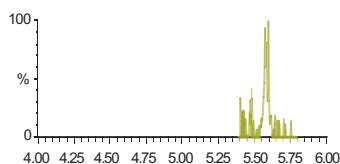
Market-leading limits of quantification allow you to take giant steps forward in your most challenging UPLC /MS/MS quantification applications.

### Pesticides in Drinking Water ESI+

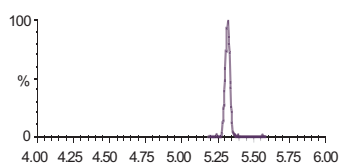
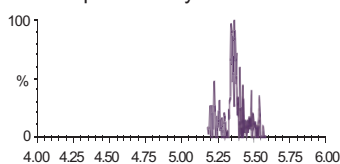
Sensitivity without  
StepWave ion optics

Enhanced sensitivity  
with StepWave ion optics

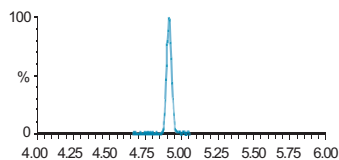
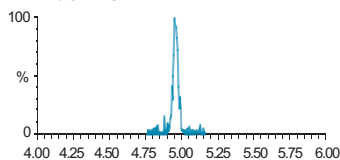
Linuron



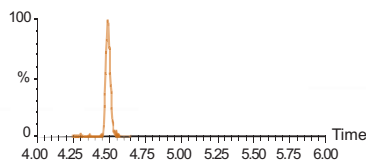
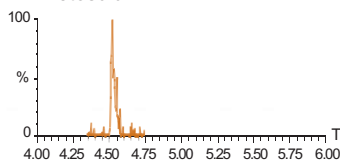
Azinphos-methyl



Atrazine



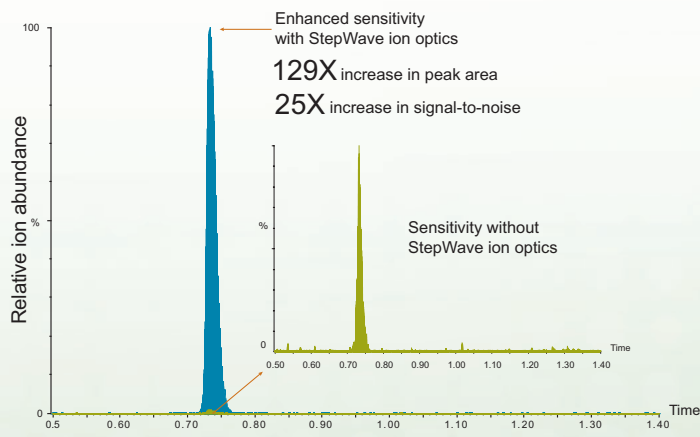
Metosulam



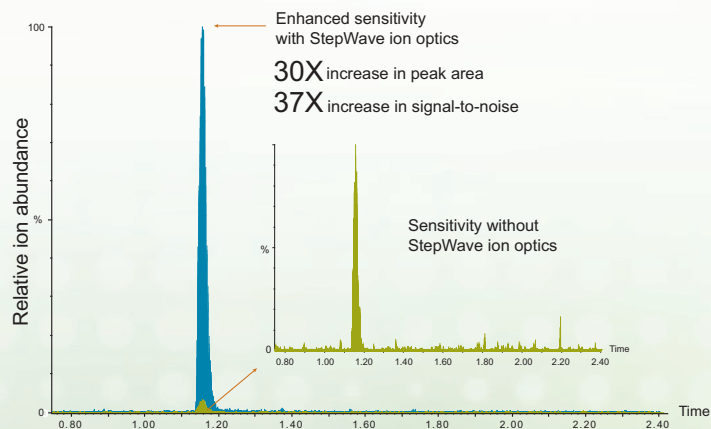
### UPLC/MRM Comparison of Xevo TQ-S Relative to Xevo TQ

COMPOUND NAME	IONIZATION MODE	RELATIVE PEAK AREA	RELATIVE S:N
Fenuron	ESI+	30	7
Metamiton	ESI+	32	15
Acephate	ESI+	27	7
Chlortoluron	ESI+	27	8
Adicarb	ESI+	27	6
Demeton S Methyl	ESI+	26	9
Phoxim	ESI+	64	19
Kresoxim Methyl	ESI+	64	4
Azinphos Methyl	ESI+	42	6
Azoxystrobin	ESI+	45	4
Dimethoate	ESI+	23	10
Acetamiprid	ESI+	30	28
Fluticasone	ESI+	30	3
Formoterol	ESI+	39	4
Nefazodone	ESI+	28	3
Desmopressin	ESI+	129	25
Salmeterol	ESI+	41	8
Alprazolam	ESI+	21	13
Reserpine	ESI+	25	5
Ibuprofen	ESI-	13	16
Prostaglandin E2	ESI-	30	17
<b>Mean Value</b>		<b>38</b>	<b>11</b>

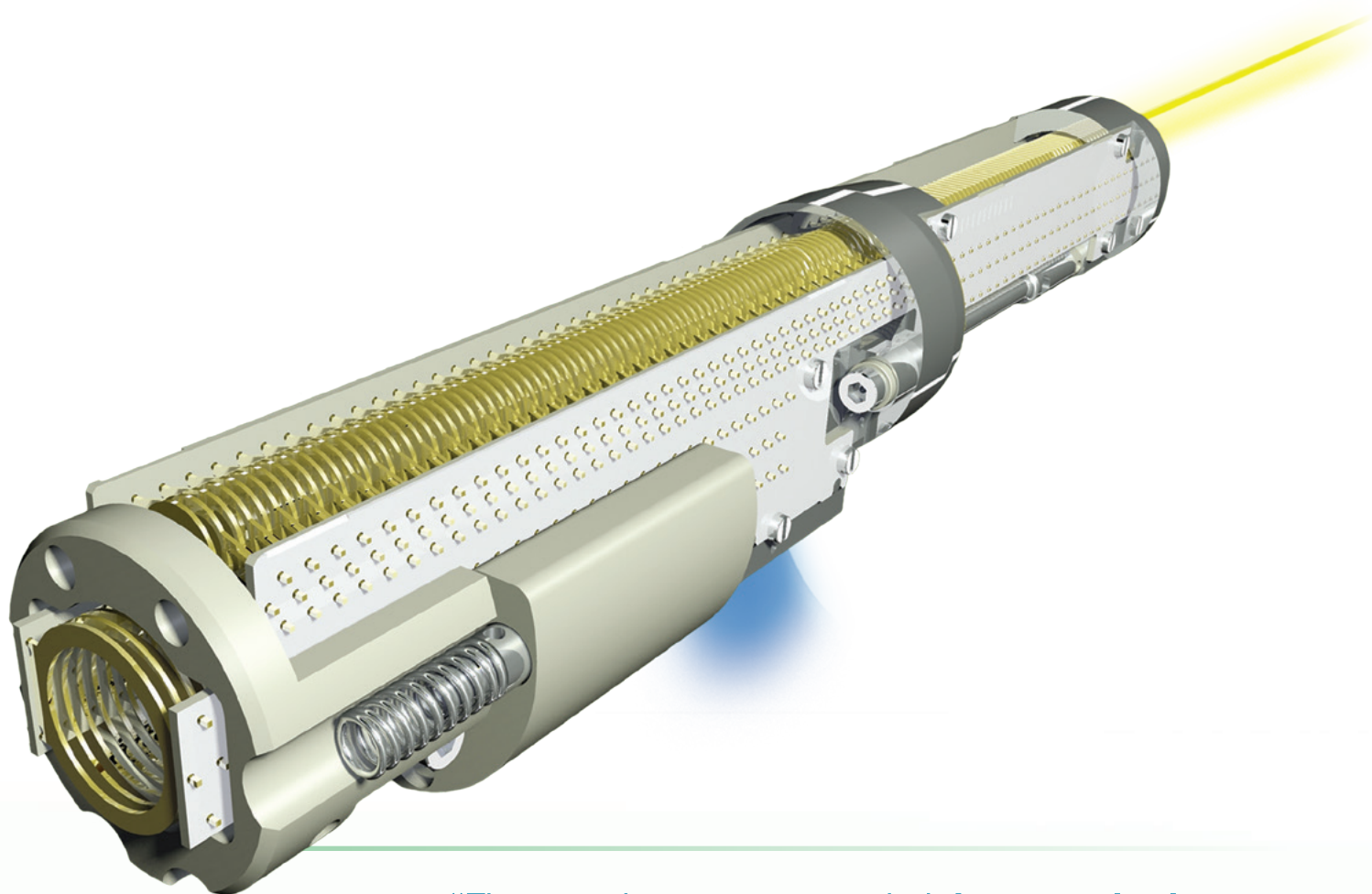
### Therapeutic Peptide Desmopressin ESI+



### Prostaglandin in protein precipitated plasma ESI-



## STEP UP TO YOUR ANALYTICAL CHALLENGES WITH STEPWAVE, THE LATEST BREAKTHROUGH IN ION TRANSFER OPTICS



“The speed, sensitivity and ability to multiplex peptide analyses has revolutionized the way we work, enabling quicker tests to be developed in a fraction of the time.”

Dr. Kevin Mills, Institute of Child Health & Great Ormond Street Hospital,  
University College, London.

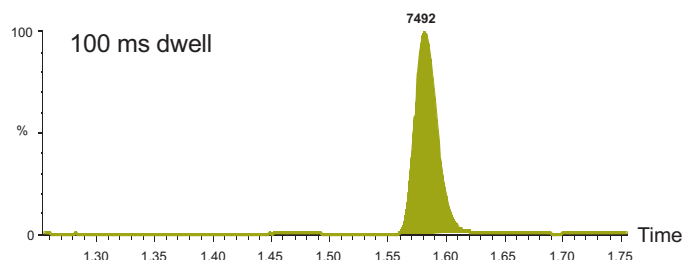
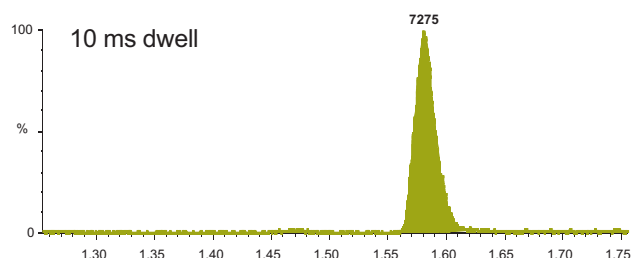
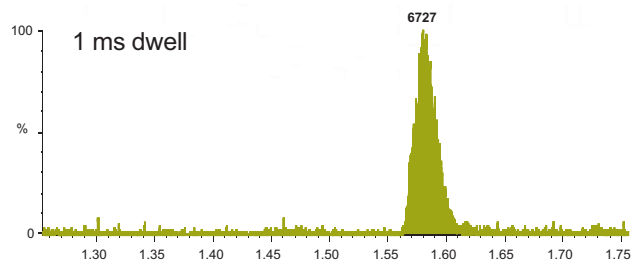
## ENHANCED SPECTRAL CONFIRMATION

Unlike conventional tandem quadrupole mass spectrometers, Xevo TQ-S gives you both the very best quantitative data as well as superior spectral MS/MS information. With a single instrument platform adaptable to a variety of different UPLC /MS/MS applications, you'll quickly maximize your return on investment.

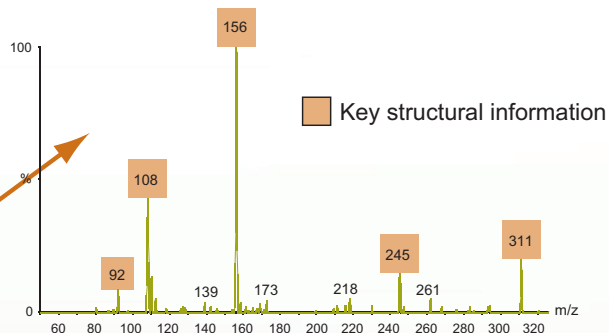
Conventional tandem quadrupole MS instruments are sensitive enough when used to monitor targeted compounds in MRM mode, but they are significantly less sensitive when used to acquire UPLC /MS/MS data in spectral mode.

ScanWave technology allows ions within the collision cell to be accumulated and then separated according to their mass-to-charge ratio ( $m/z$ ). Synchronizing the release of these ions with the scanning of the second quadrupole mass analyzer significantly enhances the signal intensity of full scan product ion spectra. Simply put, this enables you to more easily confirm the identities and structures of your analytes of interest.

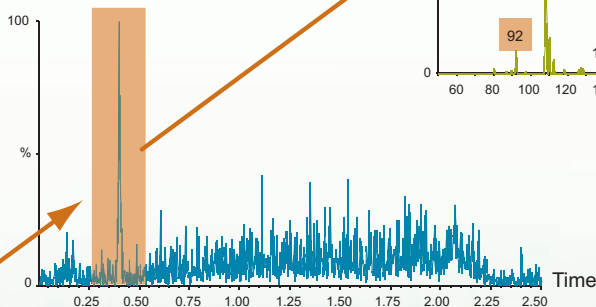
*Xevo TQ-S is capable of the highest MRM data acquisition rates without significant losses in signal. This ensures the very best MRM quantification data for your demanding, high speed, and high resolution UPLC/MS/MS assays.*



### ScanWave Enhanced Product ion spectrum

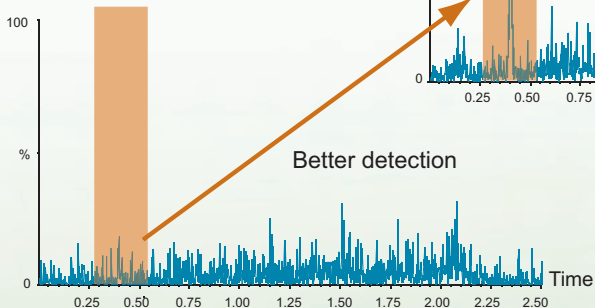


### ScanWave Enhanced Product ion scanning chromatogram



### Without ScanWave

#### Product ion scanning chromatogram



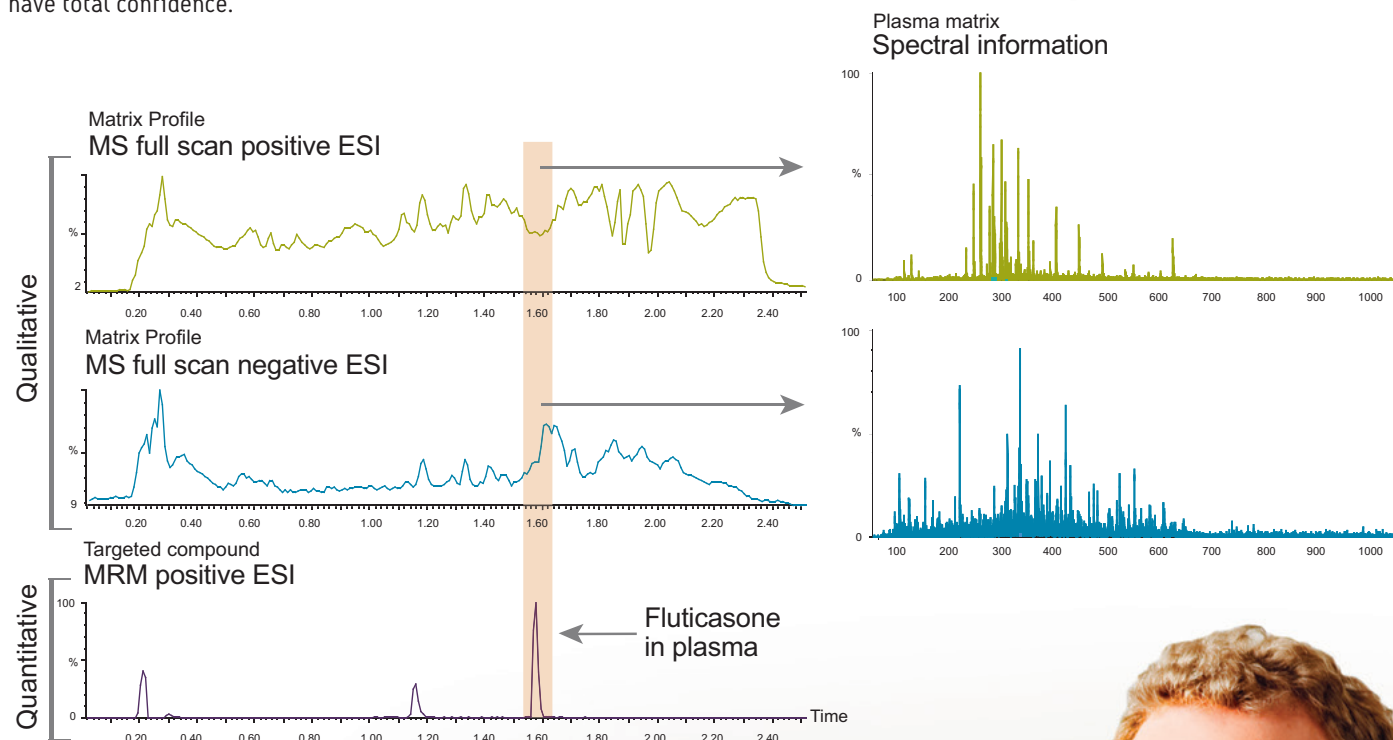




## KNOW THE SECRETS OF YOUR SAMPLE

You no longer have to accept the complications and uncertainty associated with matrix effects. When performing targeted quantification, RADAR allows you to see the whole picture, and have total confidence.

In RADAR mode, you can monitor for matrix interferences, metabolites, impurities, and degradants in your sample while accurately quantifying your target compounds.



With RADAR you can collect data in both multiple reaction monitoring (MRM) and full scan spectral acquisition modes at the same time. In addition, RADAR mode acquires all detectable ions in both positive and negative full scan MS, arming you with a depth of knowledge about your sample not previously possible from a traditional quantitative assay.

RADAR is only possible because of the ability to rapidly alternate between MS, MS/MS, positive, and negative ion modes without compromising performance in any mode.



# CONFIDENT WORKFLOWS, MEANINGFUL INFORMATION, BETTER RESULTS

## PREPARE

Waters MS technologies ensure that your system is operating optimally – ready to run for experts and beginners alike.

**IntelliStart:** Our unique IntelliStart technology allows quick and confident system setup – so it's always ready.

**Quanpedia:** Our extensible and searchable Quanpedia database allows for quantitative LC /MS method information (automatic scheduling of MRMs).

**Proven sample preparation:** With proven sample preparation tools such as Oasis® and DisQuE™ Dispersive SPE, rugged, faster, and more efficient assays are guaranteed.

## ANALYZE

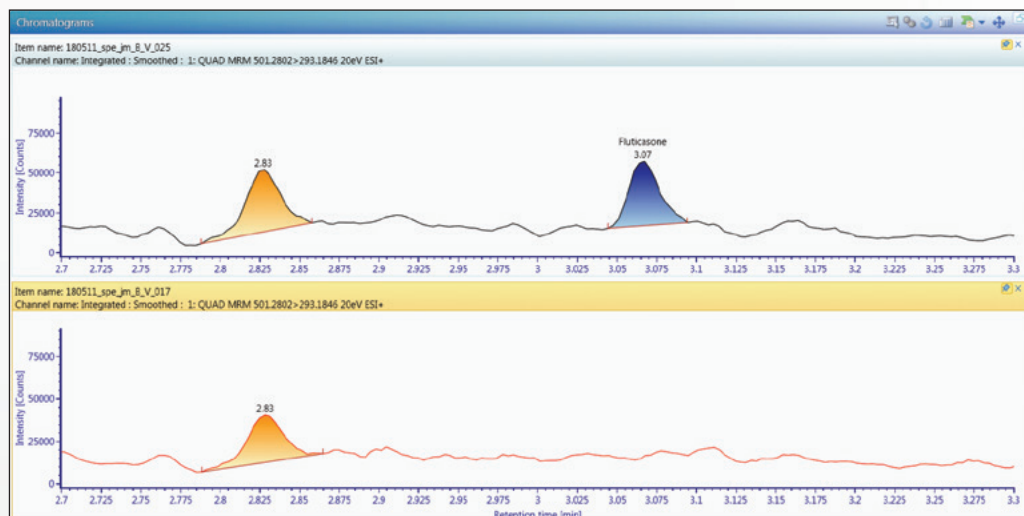
UPLC-compatible data acquisition rates, optimal ion source designs, together with innovative StepWave and ScanWave technologies enable the lowest limits of quantification and the highest quality of spectral information to be generated within a single analytical run.

## INTERPRET

Redefine your analytical workflow with an unprecedented ability to process, visualize, compare, and interpret the most complex data, automatically. Then turn it into meaningful information quickly with targeted MassLynx™ Application Managers.

## DECIDE

It's easier than ever to manage and act on the results of your data with MassLynx and NuGenesis® SDMS Software. With the ability to compile clear and accessible reports to share throughout your organization and store centrally, you'll be able to make decisions faster and better than ever before.



0.750pg/ml Fluticasone Propionate and plasma blank.

	NIST SRM 1849a Amount ± range			Mean	RSD	Accuracy	n
Biotin (µg/kg)	1990.0	±	130.0	2140.0	3.0%	108%	11
Folic acid (µg/kg)	2290.0	±	60.0	2320.0	2.2%	101%	19
Niacin (mg/kg)	109.0	±	10.0	109.0	1.9%	100%	19
Pantothenic acid (mg/kg)	68.2	±	1.9	69.8	2.0%	102%	19
Pyridoxine (mg/kg)	13.5	±	0.9	13.7	1.9%	101%	19
Riboflavin (mg/kg)	20.4	±	0.5	20.7	2.8%	101%	19
Thiamine (mg/kg)	12.6	±	1.0	13.2	2.3%	105%	19

Water-soluble vitamins multi-analyte method data for 19 separate analyses over an eight-month period.

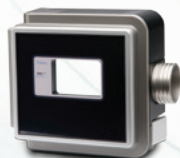
## TESTING THE LIMITS OF YOUR IMAGINATION



The universal ion source architecture of the Xevo family allows you to use the widest range of ionization techniques today, while future proofing for the innovations of tomorrow. You'll have limitless choice in experimental options.



*ionKey/MS™*



*APGC – Atmospheric Pressure Gas Chromatography*



*APPI – Atmospheric Pressure Photo Ionization  
APCI – Atmospheric Pressure Chemical Ionization*



*ESI – Electrospray Ionization  
APCI – Atmospheric Pressure Chemical Ionization  
ESCi® – Dual ESI and APCI*



*ASAP – Atmospheric Solids Analysis Probe*

## TOTAL FLEXIBILITY. CHANGE YOUR ION SOURCES, NOT YOUR INSTRUMENTS.

When you need options and time is critical, ion sources are quickly interchangeable and ready to use within minutes.





The

## Xevo TQ-S

A STEP UP TO THE  
ULTIMATE SENSITIVITY



## Xevo TQ-S micro

THE NEXT STEP IN  
ROBUST SENSITIVITY



## Xevo TQD

RUGGED, ROBUST,  
AND PROVEN



# Power of Xevo

Whatever your quantitative application, the Xevo tandem quadrupole family is up to the challenge.

Unparalleled reliability, sensitivity, and accessibility completes the Xevo tandem quadrupole family. Bringing results when you need them, helping you to overcome your complex scientific challenges.

Xevo TQD, Xevo TQ-S micro and Xevo TQ-S are designed for quantitative UPLC/MS/MS applications; you can quantify and confirm trace components at even lower levels in the most complex of samples.

Best of all, every Xevo system allows you to achieve your goals with unparalleled speed and ease.



# Xevo<sup>®</sup>

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