Oligonucleotide Analysis Solutions

Achieve the Unexpected In Your Oligonucleotide Analysis

LC-MS Oligonucleotide Analysis Can Be Challenging
But it doesn’t have to be. Whether your need is for high sensitivity quantitation or characterization of impurities or catabolites, SCIEX provides complete end-to-end solutions for fast, easy, and confident LC-MS oligonucleotide analysis.

Instruments for Every Need and Every Workflow
Regardless of your Oligo needs and separation and mass analyzer preferences, SCIEX has a complete solution to meet your needs.

<table>
<thead>
<tr>
<th>Workflow</th>
<th>LC</th>
<th>MS and Ion Source</th>
<th>Software</th>
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<td>Quantitation</td>
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<td>Microflow</td>
<td>Microflow</td>
<td>QTRAP® 6500+ Optiflow®</td>
<td>OS-Q MultiQuant</td>
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<td>TripleTOF® 6600+ Optiflow®</td>
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<td>Characterization</td>
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<td>QTRAP® 6500+ Optiflow®</td>
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Table 2: Compatibility matrix of application workflows, mass spectrometry systems, and software packages.

For more information, visit: sciex.com/oligoanalysis
Remove the Noise

Keep the Signal.

Oligonucleotides are often in very complex sample matrices from which they can be difficult to extract. You can gain greater confidence in your results and higher throughput by eliminating the need for traditional liquid-liquid extraction techniques by using the Phenomenex® Clarity® OTX™ SPE sample preparation kit. Designed specifically for DMPK/ADME environment, the Clarity OTX procedure requires only a 15-minute extraction and is amenable to high throughput environments using the 96-well SPE format.

Table 1: The Phenomenex® Clarity OTX™ Buffer and Extraction Solution is Suitable for Most Oligo Therapeutics and Biological Matrices

<table>
<thead>
<tr>
<th>Oligo types</th>
<th>Sample types</th>
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<tbody>
<tr>
<td>DNA</td>
<td>Plasma</td>
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<tr>
<td>Aptamers</td>
<td>Serum</td>
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<tr>
<td>RNAi / siRNA</td>
<td>Urine</td>
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<tr>
<td>Thioates</td>
<td>Tears</td>
</tr>
<tr>
<td>Lipid-conjugates</td>
<td>Saliva</td>
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<tr>
<td>Liposome encapsulated</td>
<td>Tissue</td>
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Figure 1. Due to the typical 80% and greater recoveries of the parent oligonucleotide therapeutic and its metabolites, detection in the picomole range is possible. The TIC above illustrates detection of a dosage in this very sensitive range. Aliquots of 500ng & 50ng spiked into plasma were extracted using Clarity OTX to determine sensitivity limits.

A TIC of the 500ng load is shown above. The 14.3 minute peak corresponding to the 19mer P-S can be quantitated. While a peak is not observed for the TIC of the 50ng load, using a XIC at m/z of 944 (the -7 charge state) one can still quantitate the oligonucleotide at very low levels.

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Make the Move to MicroFlow


Microflow chromatography will not only decrease system contamination and reduce system downtime for cleaning but you’ll gain an instant boost in sensitivity. All of this, while maintaining utmost ease and usability with SCIEX plug-and-play sources and chromatography equipment designed specifically for microflow.

Optimal Microflow Ionization with Simplified Set Up

Smart Simplicity: Designed with a “no fuss” mentality, the OptiFlow® Ion Source provides maximum sensitivity with no manual adjustments.

Intelligent probe sensing presets the system source settings to an optimal range for the best spray conditions. Consistent droplet formation and stable spray are ensured with the SteadySpray™ Probe design.

SecurityLink tubing provides a no-tools-required zero-dead-volume connection between your column and source using a permanently attached fitting on the source that has an internal torque limiter. The design enables selection of a wide range of column chemistries optimized for oligonucleotide applications.

Plus, SCIEX microflow solutions deliver exceptional performance and stability even at higher temperatures and pH conditions.
As a leader in quantitation, SCIEX continually develops innovative and productive ways to help you achieve your need to extend the lower limits of quantitation. Our MircoLC allows you to obtain increased sensitivity and the easy to use OptiFlow® Turbo V source enables consistency of performance previously unavailable in micro flow.

Figure 2: Conventional flow vs. microflow for quantitation of fomivirsen. Fomivirsen is a synthetic antisense oligonucleotide comprising 21 bases linked by phosphorothioate bonds (5’-G*C*G*T*T*T*G*C*T*C*T*T*C*T*T*C*T*T*G*C*G-3’). Microflow improves LLOQ by 5x. Top: Conventional flow 300 uL/min; LOD = 2 ng/mL, LLOQ = 5 ng/mL. Bottom: Microflow 6 uL/min; LOD = 0.52 ng/mL, LLOQ = 1 ng/mL.

Figure 3: Comparison of high flow and micro flow internal standard response across the experiment. High flow and micro flow exhibit very good stability and repeatability across the experiment.

Ultimate Balance of Sensitivity and Robustness

The MS MicroLC System combines maximum robustness with maximum performance in a space-saving footprint. Engineered to provide robust and reproducible microfluidic flow control down to 1 uL/min, the system is flexible for many workflows and is compatible with any microLC column.
Complete Solutions for Your Oligonucleotide Analysis

**Fast and Confident Implementation.**

No matter the flow rate or platform SCIEX instruments all benefit from an orthogonal spray and actively vented ion source that reduces contamination. This provides higher system uptime with less system down time for cleaning and decontamination.

**SCIEX QTRAP® 6500+ System**
Excellent negative ion mode performance ensures high sensitivity for the lowest levels of oligonucleotide quantitation. With MS/MS based quantitation, your assays will benefit from better selectivity by reducing confounding peaks due to isobaric and isoelemental contaminants and provide more confidence in results with less need for confirmatory experiments.

**SCIEX TripleTOF® 6600+ System**
The high performance ultra-fast TripleTOF 6600+ system enables high resolution MS/MS structural characterization workflows with the capability to quantitate using high resolution MS data. The fast scan speeds ensure a comprehensive data set from even the most complex and challenging samples. Powered with ProMass Software, which is an industry standard for oligonucleotide characterization and purity analysis.

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Figure 3: A complete end-to-end solution for oligonucleotide quantitation including the Phenomenex Clarity OTX SPE kit, M5 MicroLC System, SCIEX QTRAP 6500+ with the OptiFlow Ion Source, SCIEX OS-Q Software, or MultiQuant Software.

Figure 4: SCIEX solution for oligonucleotide characterization including the Phenomenex® Clarity® OTX SPE Kit, M5 MicroLC System, SCIEX TripleTOF 6600+ with the OptiFlow® Ion Source, and ProMass Software.

For more information, visit: [sciex.com/oligoanalysis](http://sciex.com/oligoanalysis)
Sciex offers comprehensive software workflow packages for oligonucleotide quantitation in discovery and development to support preclinical and clinical efforts for assessing pharmacokinetics and *in vitro* and *in vivo* metabolism and stability studies.

**Sciex OS-Q and MultiQuant Software**
- Feature-rich quantitation software packages
- Fully 21 CFR Part 11 compliant ready
- Flexible quantitation using MS or MS/MS data
- Easily sum multiple ions for increased specificity and sensitivity

20 out of the top 20 Pharma and BioPharma companies use Sciex compliant LC-MS software solutions
Stop Wasting Time

Get the Data You Need Faster.

Start to dramatically shorten your time to a confident answer. SCIEX oligonucleotide analysis solutions will speed up your data analysis, increasing your sensitivity while also simplifying and improving your sample preparation and system set-up.

Not quite ready to make the move to Microflow?

The Turbo V™ Ion Source, renowned around the world for its efficiency and productivity, and the IonDrive™ Turbo V Sources make analytical flow easy. These robust ion sources provide exceptional stability, robustness, and ease-of-use at higher flow rates for your oligonucleotide assays.

SCIEX X500B QTOF System

Choose the compact, robust and streamlined X500B QTOF System as an affordable yet powerful solution for high flow oligonucleotide analysis. Pair it with one of our ExionLC™ UHPLC systems, one of our high flow sources, and the same sample prep kits and software for the complete package.

For more information, visit: sciex.com/oligoanalysis
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The Destination for All Your Support Needs

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Increase your confidence with compliance services to help you safeguard your data, confirm data integrity, and ensure system modifications can be traced.

Lab Enhancement Services
SCIEX Lab Enhancement Services apply a holistic approach to your lab to increase productivity and reduce system downtime.

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Our Knowledge Base and Community help you move your science forward and find the answers you need from SCIEX experts as well as your peers.

Onboarding
We register you to SCIEX Now Online, enroll you to your SCIEX University learning path, and send you a welcome email.

SCIEX University
Best-in-class content, personalized learning paths – delivered using the latest memory science techniques.

Workflow Support
Whatever your challenge, the SCIEX Support team is here to help you achieve your scientific goals quickly and efficiently.

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