Thermo Scientific
Prelude SPLC System

Making LC/MS accessible

to clinical research and toxicology labs

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Specifically designed to make the power of LC/MS accessible

Analysis of target compounds in complex biological matrices presents significant challenges for clinical research and toxicology laboratories. Immunoassays and gas chromatography/mass spectrometry either lack specificity and quantitative accuracy, or require slow, labor-intensive, and expensive sample preparation. Liquid chromatography combined with mass spectrometry (LC/MS) offers higher-quality, more-relevant information.

The Thermo Scientific™ Prelude SPLC™ sample preparation and liquid chromatography system is specifically designed to make the selectivity, versatility, and quantitative accuracy of LC/MS more accessible to clinical research and toxicology laboratories. The Prelude SPLC system:

- Enhances LC/MS performance
- Increases productivity
- Simplifies operation
- Maximizes uptime and minimizes operating cost

Matched to a Thermo Scientific mass spectrometer, a Prelude SPLC system provides automated cleanup and reproducible, high-performance separation of complex samples. Preprogrammed, application-specific LC/MS research methods accelerate setup and reduce time to data acquisition.

Prelude SPLC system with a Thermo Scientific™ TSQ Vantage™ triple quadrupole mass spectrometer

LC/MS—Performance against which all other methods are measured

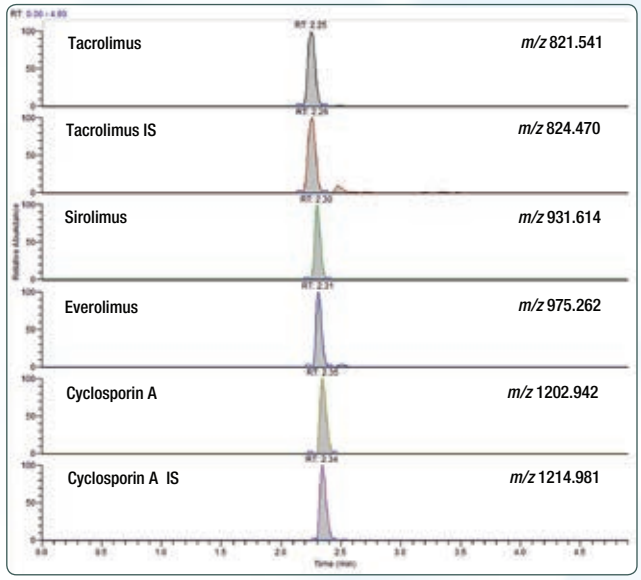
Offering superb sensitivity and selectivity, LC/MS is the proven standard for quantitative analysis of targeted compounds in complex biological matrices such as those commonly found in clinical research and toxicology work. The Prelude SPLC system makes it easy to use the power of LC/MS to meet such analytical challenges.

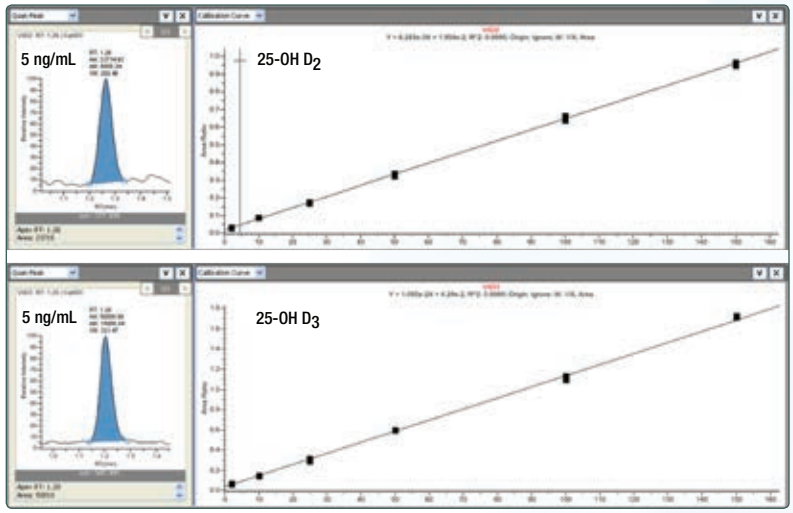
Online sample cleanup and high-performance separations optimize LC-MS/MS results

The Prelude SPLC system incorporates two channels of high-performance liquid chromatography (HPLC) separation with automated sample cleanup to enhance LC-MS/MS sensitivity.

- **Thermo Scientific™ TurboFlow™ technology eliminates matrix interferences and ion suppression while capturing analytes of interest**
- **Thermo Scientific™ Accucore™ columns provide microparticulate performance at higher flow rates for fast, high-resolution separations**
- **Precise, accurate 10–2000 µL/min flow rates and low-volume gradient formation provide the level of chromatographic performance necessary for rapid, reproducible sample analyses**
- **Refrigerated sample introduction from deep-well plates or 2 mL vials preserves samples during long automated runs**

Targeted LC-MS/MS analysis of immunosuppressants using an online TurboFlow method on a Prelude SPLC system generates high-quality, reproducible results for clinical research



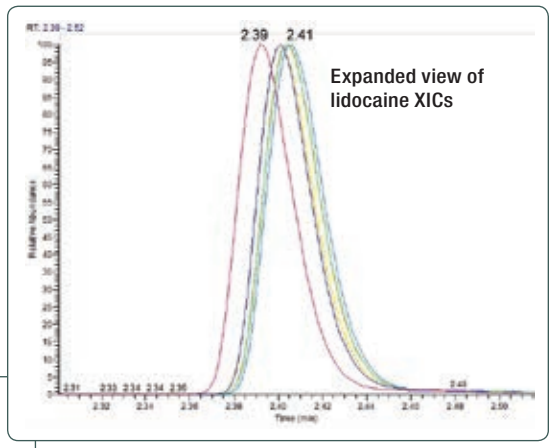


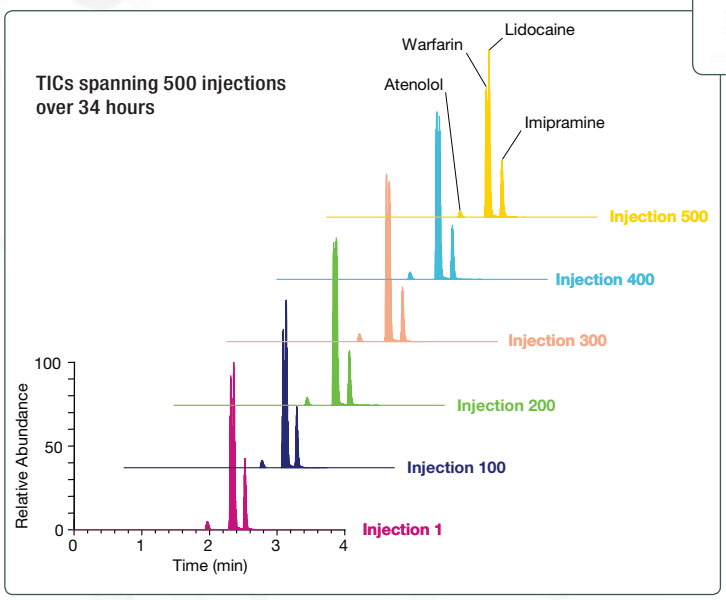
A Prelude SPLC system and TSQ Vantage triple quadrupole MS provide sensitive, precise quantitation of vitamin D metabolites (25-OH D_3/D_2) for clinical research

Eliminating chromatographic variability

The variability inherent in manual sample preparation, mobile-phase quality, use of multiple LC platforms, and column and gradient reproducibility can all compromise LC/MS results. The Prelude SPLC system is specifically designed from the ground up to minimize analytical variability and maximize analytical confidence while maintaining method flexibility.

- **High-quality analytical and TurboFlow columns eliminate variability in sample preparation and separation**
- **Fisher Chemical™ LC/MS-grade solvents provide purity necessary for highly reproducible results**
- **A unique syringe pump design ensures highly reproducible flow rates and gradient formation while minimizing pump maintenance**





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500 injections of four drugs in pooled, crashed human serum demonstrate the Prelude SPLC system's ability to generate reproducible separations in research and toxicology laboratories. Runs were multiplexed using the same TurboFlow and HPLC method on two chromatographic channels and a single mass spectrometer. MS area count RSDs for the 500 runs were ‹10% for all four compounds. No internal standard was used for normalization.

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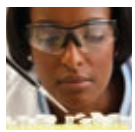


Enhanced productivity

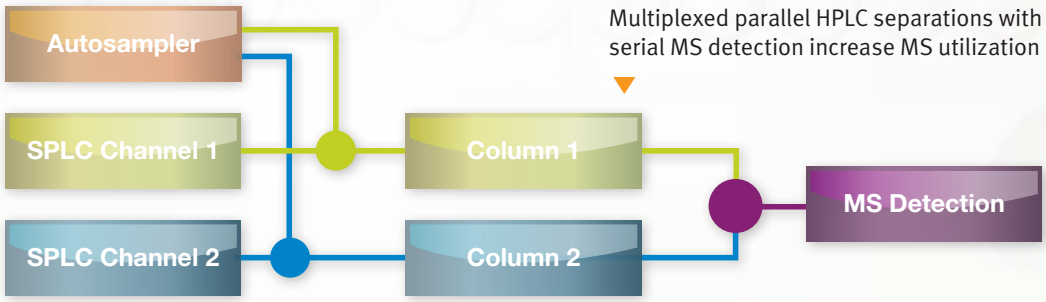
Accelerating sample preparation

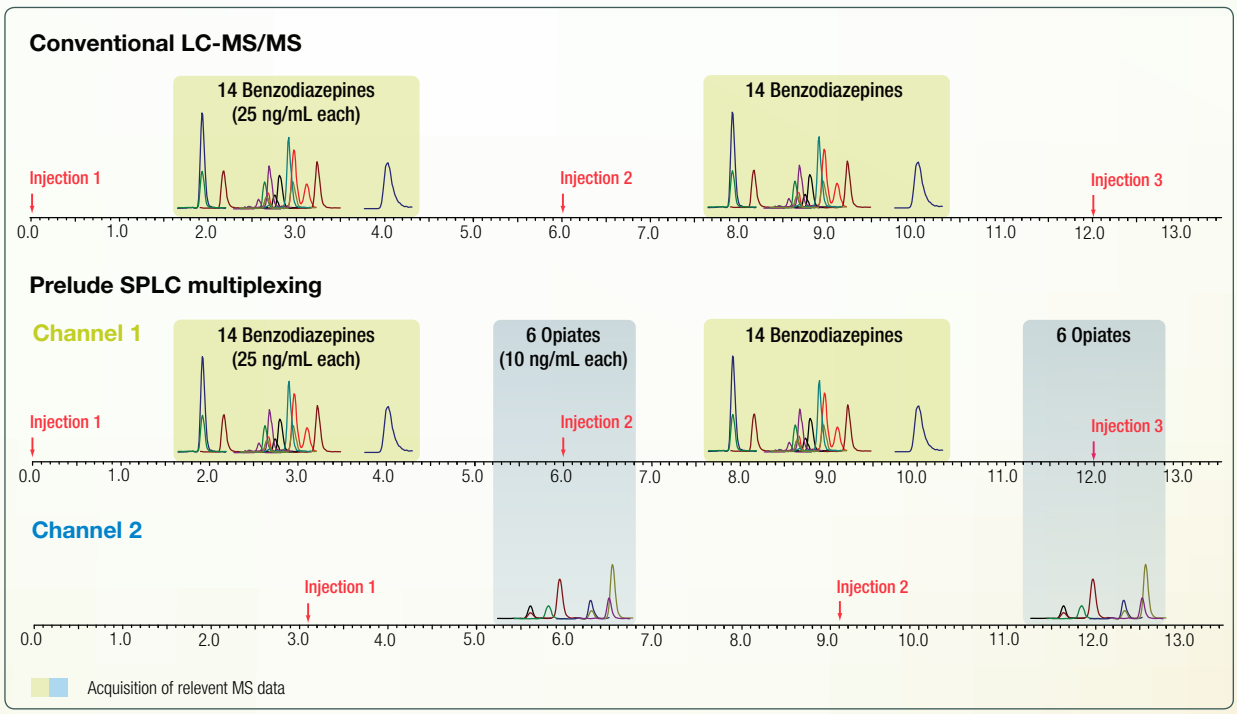
The Prelude SPLC system's online sample preparation powered by TurboFlow technology enhances productivity by automating most aspects of sample preparation, dramatically reducing manual steps and overall sample preparation time.

Maximizing MS utilization and throughput

In traditional liquid chromatograph-mass spectrometer (LC-MS) systems, the mass spectrometer receives samples from only one liquid chromatograph; the MS is not acquiring relevant data for a significant portion of the run. Prelude SPLC systems have two separate LC channels that can be operated in parallel, using either identical or different methods, and channeled serially into a single mass spectrometer. This multiplexing:

- **Increases benefit from MS hardware investment since the MS is more fully utilized**
- **Increases productivity by analyzing more samples per hour without the cost of a second MS system**
- **Increases flexibility by allowing two different assays to be run simultaneously**





Parallel analysis of 6 opiates (10 ng/mL) and 14 benzodiazepines (25 ng/mL) demonstrates how multiplexing on a Prelude SPLC can double productivity

Ease of use from start to finish

From sample preparation to data analysis to system maintenance, the Prelude SPLC system is designed to maximize productivity while minimizing effort. The system provides expert results without the cost of expert operators.

Training precedes productivity

Ease of use starts before the first sample is run. Each Prelude SPLC system includes one week of on-site training. Experts from Thermo Fisher Scientific will provide general and method-specific training to as many staff members as necessary.

Quick Start methods simplify method development

Quick Start Prelude SPLC methods enable fast startup and minimize the time invested in developing clinical research or toxicology methods. Each method includes:

- **List of required consumables**
- **Instrument method for sample cleanup and chromatographic separation**
- **Optimized MS acquisition parameters**
- **Sample chromatograms**
- **Quantitation parameters**
- **Reporting templates**

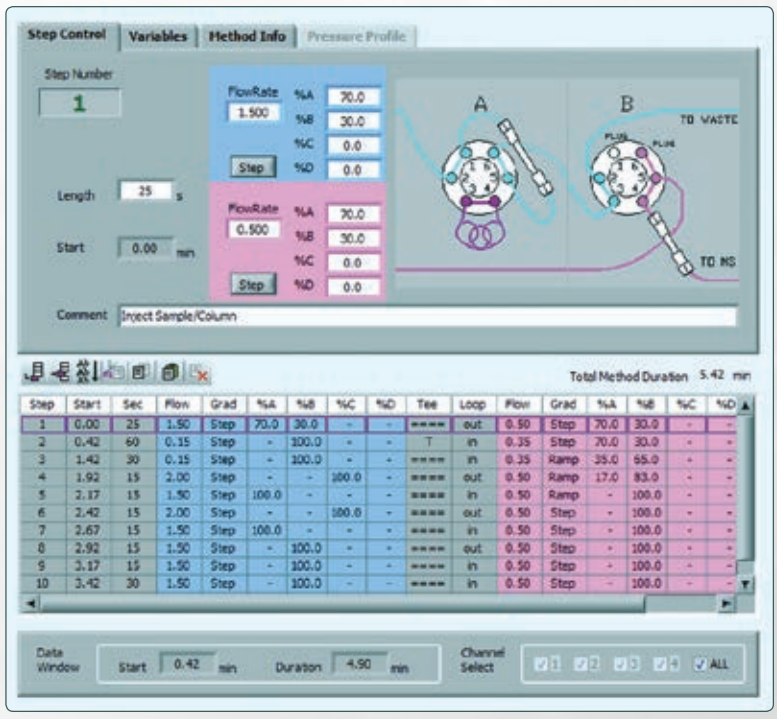
Simplified operation with TraceFinder software

Thermo Scientific™ TraceFinder™ software simplifies workflows. It provides a single, easy-to-learn user interface for LC and MS instrument control, data acquisition, data processing, and reporting. Once a method is loaded, even nonexperts can be running samples in as few as six mouse clicks.

Easy, error-free consumables replacement

Routine tasks like solvent and column replacement have been engineered to be fast and easy. Prelude SPLC systems use standard HPLC columns, which can be replaced without tools.

TraceFinder software provides a single user interface for Prelude SPLC system and MS control, data acquisition, processing, and reporting



Maximum uptime and minimum operating cost

Prelude SPLC systems maximize uptime while minimizing maintenance and operating cost. When maintenance is necessary, Prelude SPLC systems are designed to be easy to diagnose and repair.

Greater reliability by design

Moving parts are engineered to reduce failures and maintenance. Unlike conventional dual-piston HPLC pumps, the Prelude SPLC system's syringe pumps contain no active check valves and no pump seals to wear out. Prelude SPLC valves are specially designed for extended lifetime in high-performance applications.

System monitoring and proactive problem detection

Optional remote diagnostic software can e-mail notifications to the operator, lab manager, or other designated person when maintenance is required. It can also alert service engineers at Unity Lab Services when the system is not functioning properly so they can troubleshoot remotely. The diagnostics:

- **Monitor only number of injections and instrument performance, not sample data**
- **Work with most commercially available antivirus and firewall software**
- **Feature encrypted point-to-point communication that does not require a VPN**
- **Do not allow outside tracking**

Optional remote monitoring and diagnostic software monitors number of injections and system status in real time

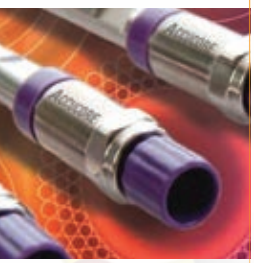
Designed for easy maintenance

Prelude SPLC components can be replaced easily so maintenance is fast, minimizing its impact on productivity. Prelude SPLC pumps and valves are modular and easily exchanged by a service engineer for a factory-tested replacement.

Reduced operating costs

Prelude SPLC systems reduce costs by bringing powerful LC/MS capabilities in-house, eliminating slow, expensive outsourcing of analyses. They also minimize operating expenses for clinical research and toxicology labs because:

- **Simplified operation means an expert operator is not required**
- **TurboFlow technology reduces sample preparation time and reagent costs**
- **High-efficiency HPLC methods reduce solvent consumption**
- **Chromatographic multiplexing maximizes MS utilization and sample throughput**
- **Robustness and reliability are designed in to minimize maintenance costs**
- **Optional remote monitoring and diagnostics ensure rapid resolution of any problems that arise**



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