![SHIMADZU logo] **SHIMADZU**
Excellence in Science

Nexera XS inert UHPLC System

Higher Peaks – Clearly

Experience newfound clarity in bioanalysis

A new peak in the analysis of biopolymers

The Nexera XS inert UHPLC system eliminates the risk of sample adsorption or surface corrosion, as well as providing all the other exceptional features of the Nexera series. It is also flexible and provides a perfect solution for a wide variety of applications.

The Problem

The potential adsorption of an analyte onto wetted surfaces of UHPLC instruments poses critical challenges when analyzing biomolecules. While elevated pressure tolerance is required to achieve optimal chromatographic separation when using small particle size columns, the inertness of wetted surfaces is also of the utmost importance, as is resistance to corrosion due to the use of mobile phases with high salt concentrations and extreme pH values.

The Solution

The Nexera XS inert system offers the optimal method for the separation of biomolecules, by combining the elevated pressure tolerance of a UHPLC system with complete inertness of the sample flow path. This is ensured by the absence of wetted metal surfaces and offers ultra-high resistance to corrosion.

As part of the Nexera series of UHPLC systems, the Nexera XS inert offers the same outstanding instrument performance capabilities as the other systems in the series, including advanced Analytical Intelligence features such as auto-diagnostics and recovery, and a patented mobile phase monitor.

ANALYTICAL INTELLIGENCE

- Automated support functions utilizing digital technology, such as M2M, IoT, and Artificial Intelligence (AI), that enable higher productivity and maximum reliability.

- Allows a system to monitor and diagnose itself, handle any issues during data acquisition without user input, and automatically behave as if it were operated by an expert.

- Supports the acquisition of high quality, reproducible data regardless of an operator's skill level for both routine and demanding applications.
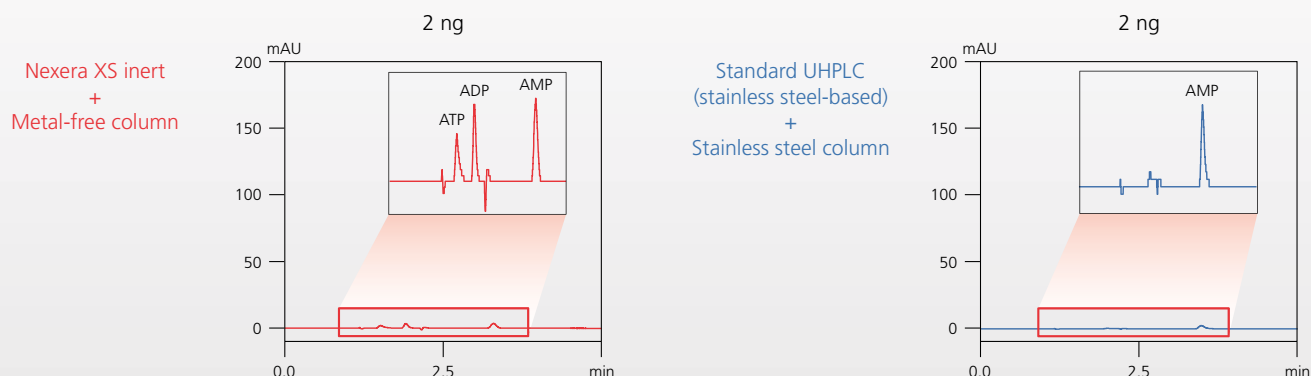
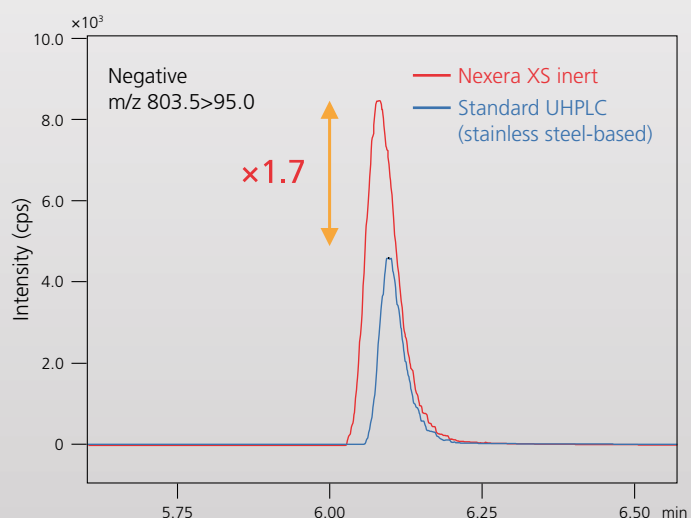# Full-range of Bio-inert UHPLC Capabilities

In addition to special finger-tight, zero-dead-volume tubing connectors that withstand pressure up to 105 MPa, the switching valves used for method scouting or trap-and-elute analysis are designed to inhibit metal adsorption. The optional pHM-40 mobile phase monitor continuously tracks any changes in pH in real time, making the Nexera XS inert the ultimate tool for ion-exchange or size-exclusion chromatography, where mobile phase pH can strongly affect chromatographic separation.

Unrestricted Recovery and Sensitivity

For the quantitative analysis of biomolecules – particularly when high sensitivity is required – the adsorption of the target compound to a metal surface can result in a dramatic decrease in sensitivity.

Nexera XS inert + Metal-free column

2 ng

mAU

200 · 150 · 100 · 50 · 0

ATP · ADP · AMP

0.0 · 2.5 · min

Standard UHPLC (stainless steel-based) + Stainless steel column

2 ng

mAU

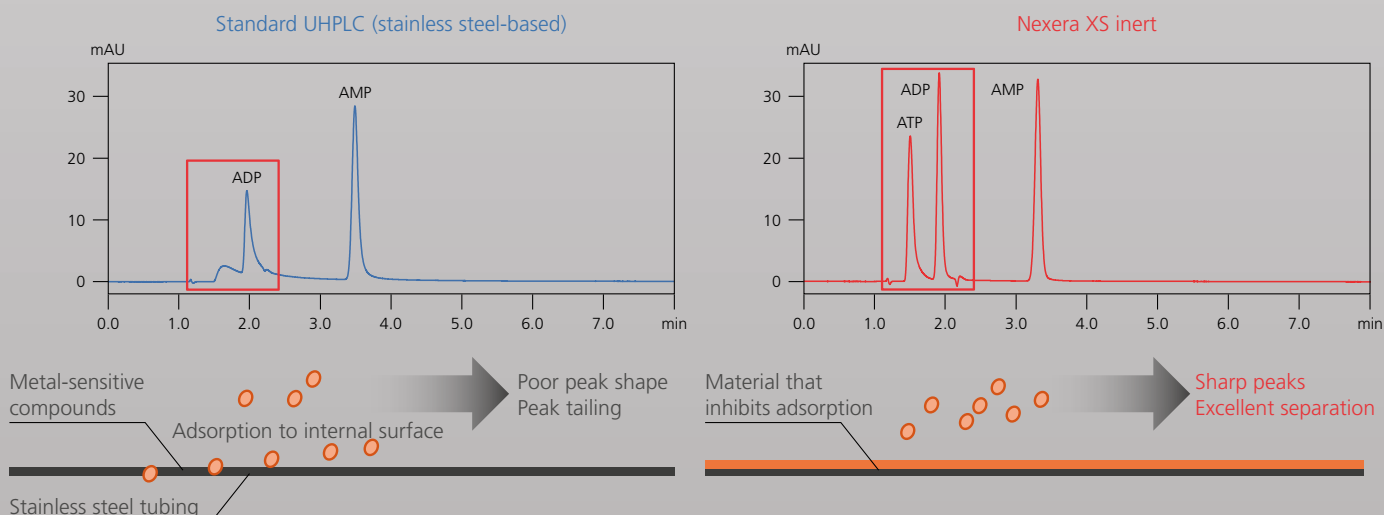200 · 150 · 100 · 50 · 0

AMP

0.0 · 2.5 · min

The Nexera XS inert system prevents peak tailing and sensitivity loss by eliminating adsorption of proteins, nucleic acids, and other components to metal surfaces. As a result, reliable and accurate quantitation is possible, even for low-concentration samples or compounds with a strong tendency of metal adsorption, such as oligonucleic acids.

×10³

Intensity (cps)

10.0 · 8.0 · 6.0 · 4.0 · 2.0 · 0

Negative
m/z 803.5>95.0

— Nexera XS inert
— Standard UHPLC (stainless steel-based)

×1.7

5.75 · 6.00 · 6.25 · 6.50 min

Clear Resolution without Restrictions

The Nexera XS inert system is equipped with innovative technology that ensures the complete inertness of the sample flow path. The system provides excellent peak shape, and quickly and efficiently delivers unsurpassed chromatographic separation by maintaining ultra-high-pressure resistance. In combination with the high speed autosampler and ultra-low carryover capabilities, the Nexera XS inert is the right MS front-end system for overcoming most bioanalytical challenges.

Standard UHPLC (stainless steel-based)

mAU

30 · 20 · 10 · 0

AMP · ADP

0.0 · 1.0 · 2.0 · 3.0 · 4.0 · 5.0 · 6.0 · 7.0 · min

Nexera XS inert

mAU

30 · 20 · 10 · 0

ADP · ATP · AMP

0.0 · 1.0 · 2.0 · 3.0 · 4.0 · 5.0 · 6.0 · 7.0 · min

Metal-sensitive compounds

Adsorption to internal surface

Poor peak shape
Peak tailing

Stainless steel tubing

Material that inhibits adsorption

Sharp peaks
Excellent separation
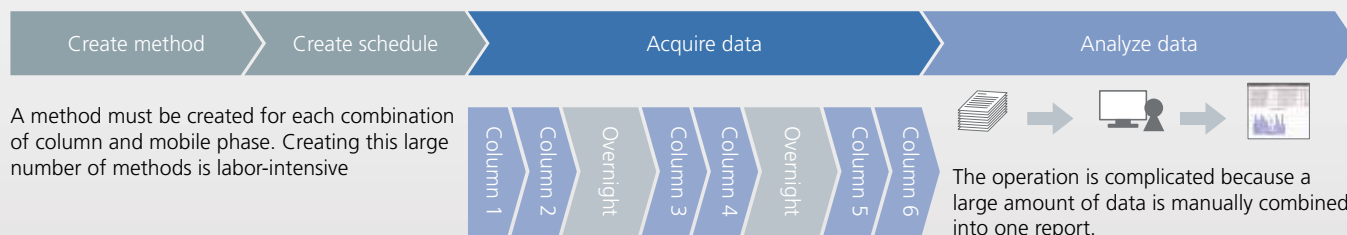
Assured Reliability and Reproducibility

In the past, a non-inert HPLC system would often be passivated by repeat injection of the target compounds before actually starting data acquisition, to "saturate" the adsorption sites on the surface and reduce the effect of sample loss. However, this approach not only wastes time and precious sample, it can also make it extremely difficult to acquire reliable data, due to changes in the state of passivation during continuous analysis. The Nexera XS inert system eliminates the need for the preliminary passivation and provides highly reliable data from the first injection and throughout the analytical sequence.
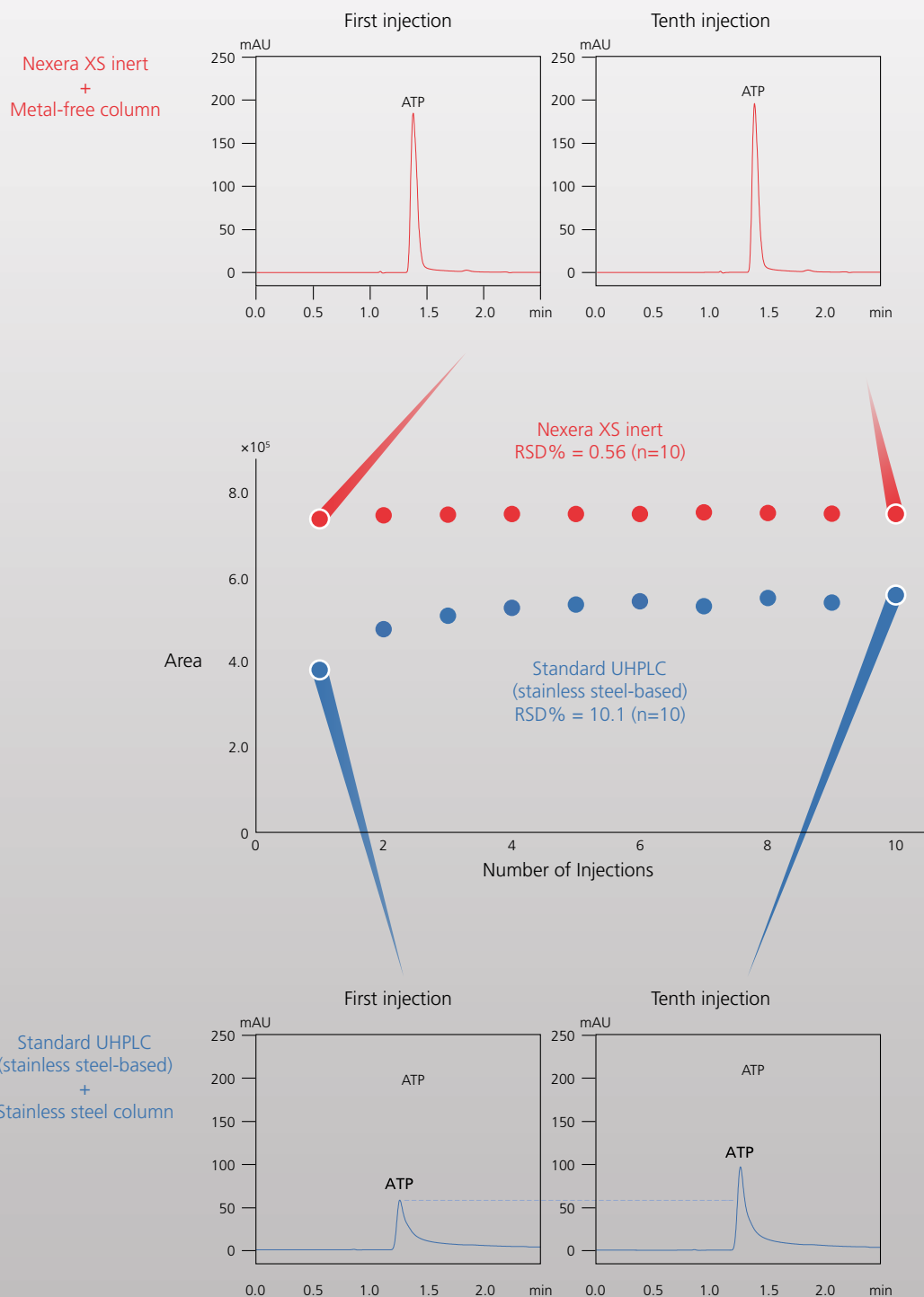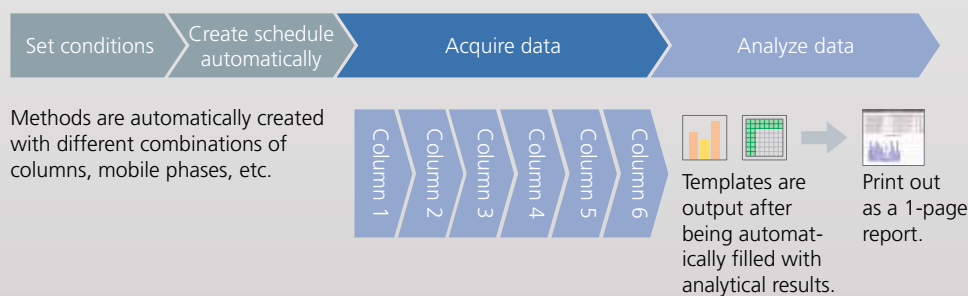
Automated Method Development

The process of considering which analytical conditions to use for an LC separation requires evaluating a huge number of possible combinations: of columns, mobile phases, column temperatures, and other factors. This can be taxing on analytical personnel. The Nexera XS inert method scouting option offers automated screening of a variety of mobile phases and separation columns to improve operational efficiency. It also helps to reduce the risk of human error. As a result, it can be used to develop reliable methods using Design of Experiments (DoE) for computer-aided optimization of mobile phase pH, salt concentration, or other analytical conditions.

Previous Method

Create method	Create schedule	Acquire data	Analyze data

A method must be created for each combination of column and mobile phase. Creating this large number of methods is labor-intensive

Column 1 · Column 2 · Overnight · Column 3 · Column 4 · Overnight · Column 5 · Column 6

The operation is complicated because a large amount of data is manually combined into one report.

Method Scouting System + LabSolutions MD

Set conditions	Create schedule automatically	Acquire data	Analyze data

Methods are automatically created with different combinations of columns, mobile phases, etc.

Column 1 · Column 2 · Column 3 · Column 4 · Column 5 · Column 6

Templates are output after being automatically filled with analytical results.

Print out as a 1-page report.

New range of consumables, for a complete solution for bioanalysis.

Adsorption of biomolecules can occur not only within instruments, but also in vials, columns, and other equipment used during sample preparation. Shimadzu offers a wide range of consumables that feature unique technologies for inhibiting sample adsorption.

Get more information:
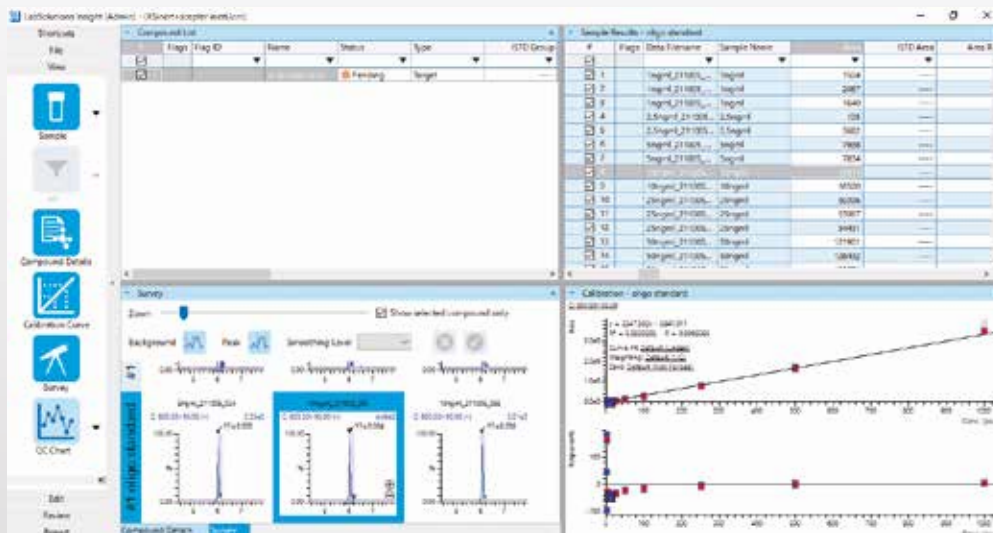**https://www.shimadzu.eu/columns-and-consumables**

Data Management

LabSolutions Insight™ Software for LC/MS Data Analysis

This dedicated LC/MS analysis software features functionalities that provide powerful support for multiple-component and multi-sample data analysis, such as flagging, filtering, and peak comparison.

Compliant with ER/ES guidelines and data integrity

A secure and future-oriented software solution is necessary to fulfill current requirements for technical records, electronic signatures and data management. With LabSolutions software, Shimadzu offers a comprehensive solution – not only for chromatography systems, but also for spectrophotometers and other laboratory instruments. Users can securely integrate a large number of systems under uniform user administration to ensure FDA 21 CFR Part 11 compliance.

Get more information: **www.shimadzu.eu/data-management-software**

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