

Trajan Scientific and Medical

Introduction

HDX has become an indispensable tool for protein binding studies in pharmaceutical development. For over 15 years Trajan's automation team (formerly LEAP Technologies) have been automating HDX experiments, and is the industry leader in the field. Our HDX systems are helping researchers across the globe answer key questions surrounding protein structure and function by providing reliable automation which is fast and easy to use.

We have the perfect model – whatever your protein analysis needs

LEAP HDX Standard* – Our foundation platform has the components required for conventional bottom-up HDX sample analysis. Temperature controlled trays for sample storage, exchange and quench (0°C to ambient) and chilled valve chamber for inline digestion, trapping and HPLC separations. Options include chilled syringe module and secondary protease column chamber.

LEAP HDX Extended – Building on features of the standard LEAP HDX, this system features an extended rail length facilitating capacity for the lipid filtration module, which may be added at the time of purchase or as a later upgrade, as well as room for additional trays or reagents for future enhanced workflow options.

LEAP HDX Throughput – The latest generation, the LEAP HDX Throughput extends capabilities to a broader range of workflows, implements more efficient time management, higher throughput and increased capacity. The use of a dual head system offers advantages in speed and flexibility for shorter time points and optimized volumetric precision. Options include dual chilled syringe module, lipid filtration and secondary protease column chamber.

*The standard rail cannot be upgraded to longer length

Successful HDX experiments

Automation addresses the 4 key factors for successful HDX experiments:

- Accurate timing of labeling and quenching.
- pH control using precise volumetric transfers and dilutions.
- Stable temperature control for each phase of the workflow, on-exchange, quenching and digestion - from 0°C up to 40°C.
- In-line digestion using immobilized protease columns optimized for low temperatures.

Hydrogen Deuterium Exchange is an experimental technique for obtaining information about changes in the tertiary structure of proteins under different physiological conditions.

The LEAP HDX platform is an advanced, automated scheduling and experimental workstation providing ease of use, high reproducibility and exceptional data quality for HDX experiments.

Labelling

HDX relies on accurate timing of the labelling step.

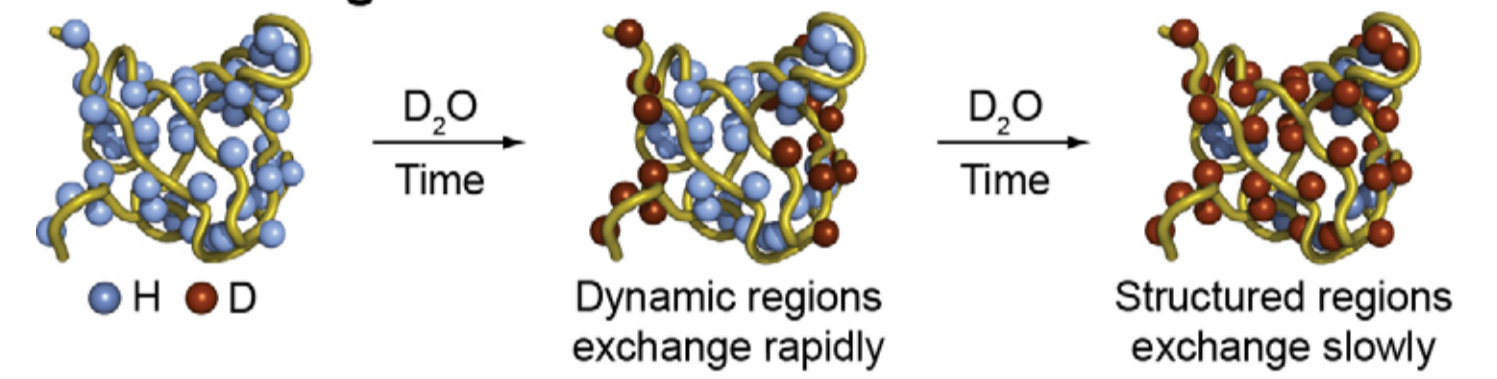
Quenching

The system will optimize the timing of the labelling step to ensure quenching is just in time for the LCMS injection, using a chilled syringe. A typical experiment might consist of a dozen time points in triplicate for each protein sample. The LEAP HDX system will schedule the experiments and perform all steps for each time point of every sample.

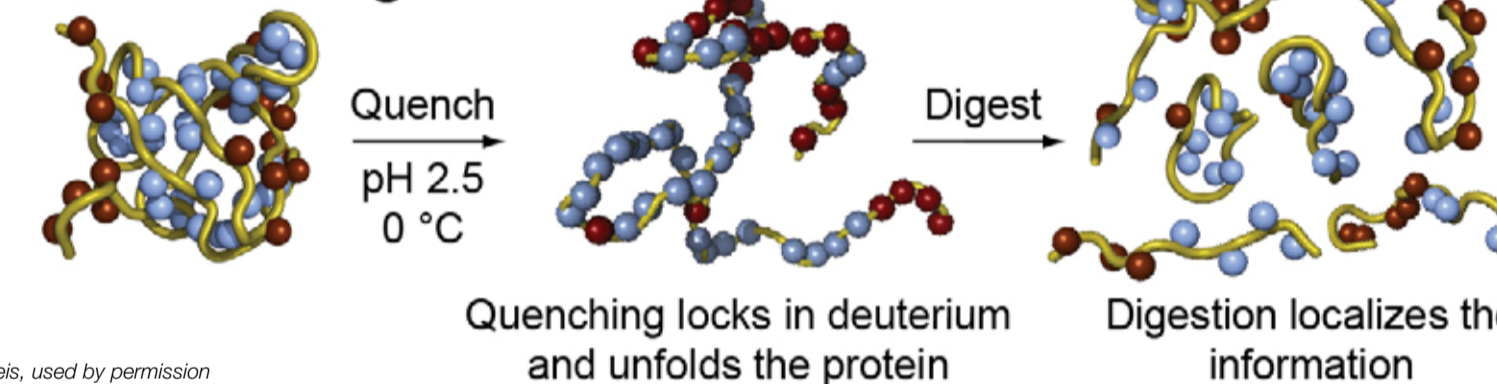
To achieve maximum throughput and minimum down-time of the mass spectrometer, all experimental time points are pre-scheduled with overlapping steps whenever possible.



H/D Exchange



Quench & Digest



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Efficient system control and optimized experimental design

Our ChronosHDX software offers a streamlined interface for HDX users allowing easy and intuitive setup for experimental time points. Temperature control at all steps ensures reliable data. Sustained 0°C environment reduces back exchange, improves sample stability and overall reproducibility. Our most flexible automation platform yet offers the ability to run multiple experimental methods in the same sequence. Native data format compatibility with HDExaminer increases high confidence data and allows you to get to results faster.

ChronosHDX control software with HDExaminer data analysis

Meeting the challenge of producing the highest quality data sets.

HDX experiments require time-sensitive operation. Therefore, in traditional methods, an operator has to attend throughout the course of HDX experiments. However, time-controlled automation enables unattended operation using intelligent scheduling with Chronos software.

Trajan uses ChronosHDX scheduling software to automate the precise labelling and quenching of samples, as well as injection and digestion of proteins on the LCMS analysis system.

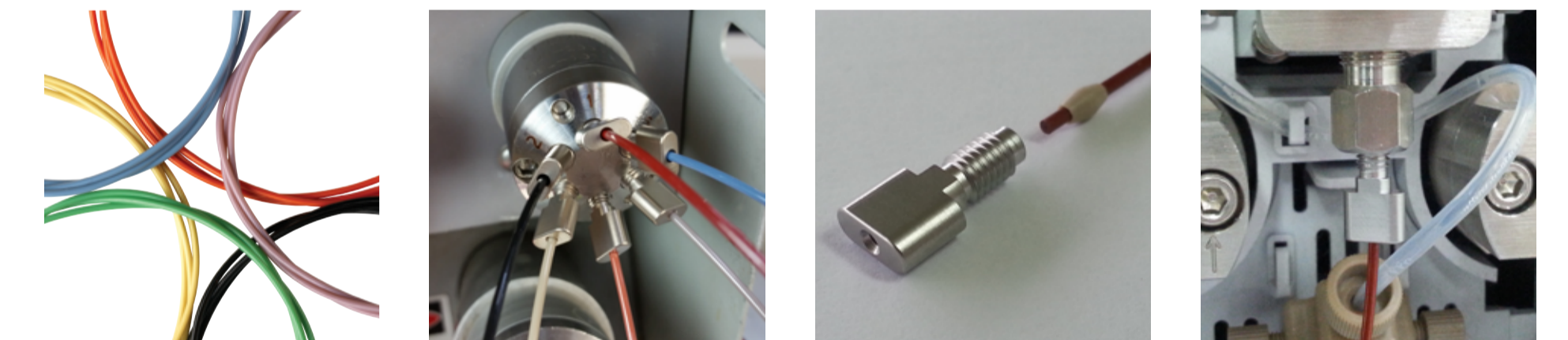
- Reproducible experimental conditions.
- Multi-valve control for trapping and elution of digested peptides to the LCMS system.
- Throughput optimization with elimination of timing conflicts.
- Simpler graphic user interface.
- Advanced method editing capabilities.
- Integrated with HDExaminer data processing from Sierra Analytics.
- Seamless integration with most major MS data acquisition software.

Optimized HDX fluidics

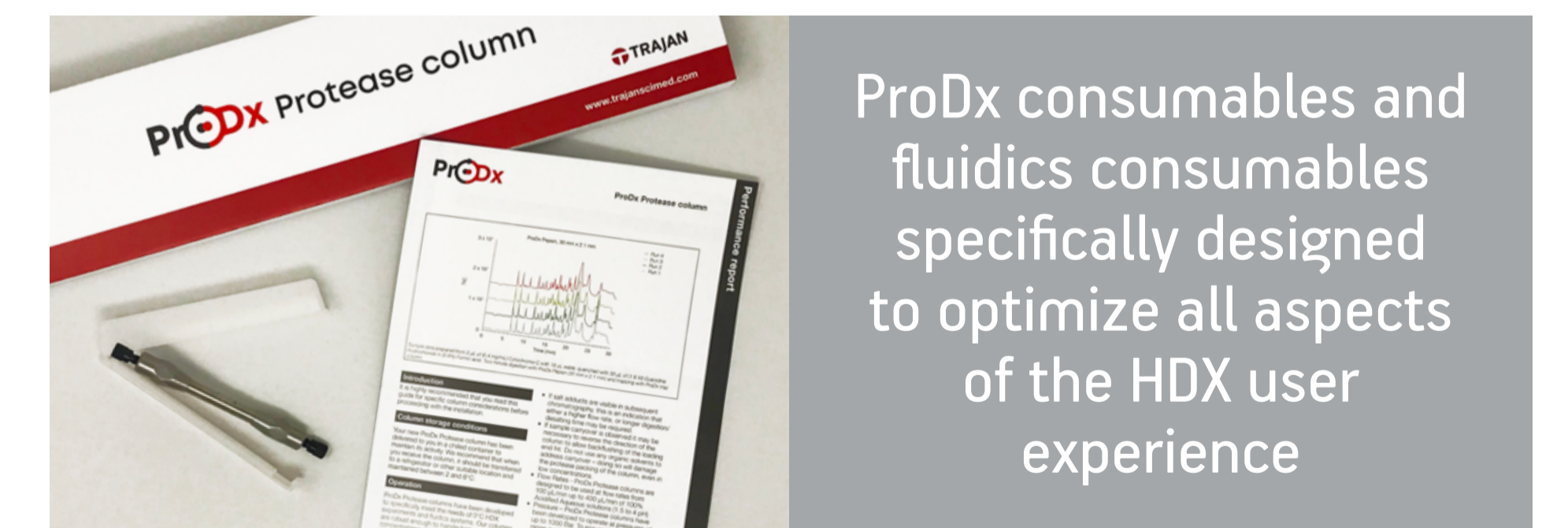
2018 introduction of optimized HDX fluidics that enables full fluidic path backflushing, extending column life and maintaining consistent retention times to deliver higher quality data.

The new fluidics pathway is built upon UHPLC rated valves and column hardware (21 kpsi), with flow paths minimized to reduce swept volumes.

Trajan manufactured HDX specific pre-cut high pressure lines and fittings, designed to improve reliability and enhance performance. All fluidic components are designed to offer consistently reproducible results.



ProDx consumables designed for HDX



Trajan, committed to extend the capabilities of the LEAP HDX platform to meet the expanding needs of the HDX community

Contact info@trajanscimed.com for further information