



ACQUITY UPLC H-Class PLUS Bio

FOR YOUR MOST CHALLENGING BIOSEPARATIONS

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PURPOSE BUILT TO CHARACTERIZE THE COMPLEX

Increasing complexity of modern biotherapeutic characterization, monitoring, and quality control assays require even more demanding analytical techniques to accurately define and assess critical quality control attributes (CQAs) related to product safety, stability, and efficacy.

The ACQUITY™ UPLC™ H-Class PLUS Bio System provides the same high resolution, high sensitivity separations you have come to expect from UPLC Technology, with the flexibility and ruggedness to run all the chromatography modes you require – ion exchange (IEX), size exclusion (SEC), hydrophilic interaction (HILIC), hydrophobic interaction (HIC), or reversed-phase – all on one system.

With its flow-through-needle injector and robust, quaternary or binary solvent delivery system, the ACQUITY UPLC H-Class PLUS Bio System has been specifically engineered with a bio-inert flow path and Auto•Blend™ Plus technology to address your most challenging bioseparations. The complete flow path is engineered with iron-free, bio-inert materials, helping your laboratory extend the lifetime of your instrument and maintain optimal bioseparations performance.

Analytical laboratories around the world are leveraging the advanced resolution capabilities of the ACQUITY UPLC H-Class PLUS Bio System.

- Reversed-phase for peptide mapping and protein separations
- SEC for detecting clips and aggregates
- IEX for charge variants
- HILIC for released glycan analysis and glycoprotein/glycopeptide separations
- HIC for ADC analysis
- Multidimensional liquid chromatography (MDLC)
- Reversed-phase for amino acid analysis

HIGHEST RESOLUTION OF ANY BIO-INERT QUATERNARY OR BINARY LC SYSTEM

Wide range of detection capabilities

UPLC-optimized detectors to match your application needs, including photodiode array, UV/Vis, fluorescence, refractive index, evaporative light scattering, and mass detection.

Flexible sample support

Accepts either vials or ANSI well plate formats. Extend capacity for high throughput and open access environments with the optional Sample Organizer.

Fraction collection

Analytical scale, temperature controlled fraction collection from your high efficiency UPLC separations to enable additional targeted studies.

Gradient SmartStart

Easily adjust for system volume differences when transferring methods from an alternative LC system without alteration to the method table.

Auto-Blend Plus technology

Program gradients directly in terms of pH, molarity, or organic composition to minimize manual mobile phase preparation, reduce human error, and accelerate method robustness testing for chromatographic methods.



Low dispersion

True UPLC performance with band spread of less than 10 μL for highest chromatographic resolution.

Versatile column management

Support for analytical LC column dimensions up to 300 mm with capacity to automatically select between as many as six analytical columns. Equipped with independently controlled temperature zones, active pre-heating, and eCord™ Intelligent Chip Technology for Waters™ columns.

Bio-inert flow-through-needle injector

Volume range of 0.1 to 1000 μL and ultra-low sample carryover performance compatible with your most sensitive LC and LC-MS applications.

bioQuaternary or bioBinary solvent management

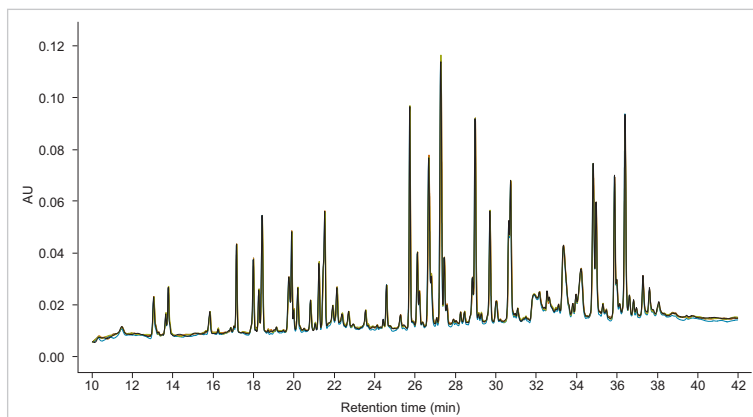
Precise and accurate blending of up to four solvents with automated solvent compressibility compensation available with the bioQuaternary solvent manager. Increase method development flexibility with an optional, integrated solvent select valve, providing access to six additional solvents. Deliver precise and accurate binary solvent blending with the bioBinary solvent manager at pressures up to 15,000 psi.

A BETTER PERSPECTIVE FOR YOUR BIOSEPARATIONS

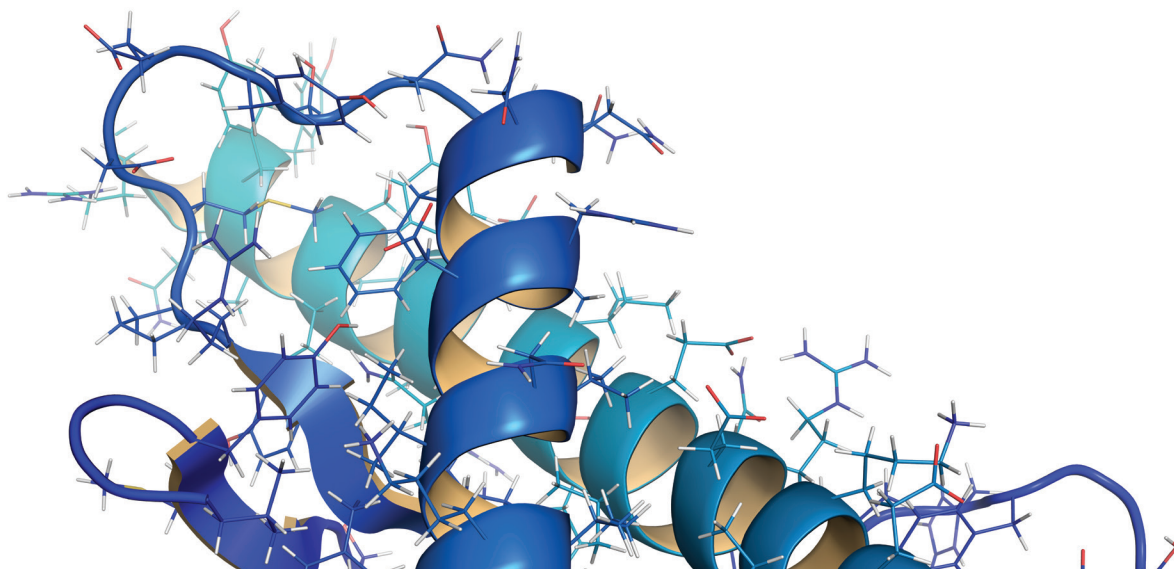
Leverage the benefits of UPLC Technology to improve your HPLC methods. By scaling your bioseparations methods to UPLC, your assays will benefit from the combination of increased speed, resolution, and sensitivity that comes with modern small particle chemistries.

Purpose built for biopharmaceutical characterization, the ACQUITY UPLC H-Class PLUS Bio System leverages high resolution column technology, advanced detection, and intelligent informatics to increase the information you receive from each and every sample.

With exceptional quaternary or binary gradient precision and accuracy formation, reliable and robust separations can be achieved for your most challenging bioseparations, day-after-day and year-after-year.

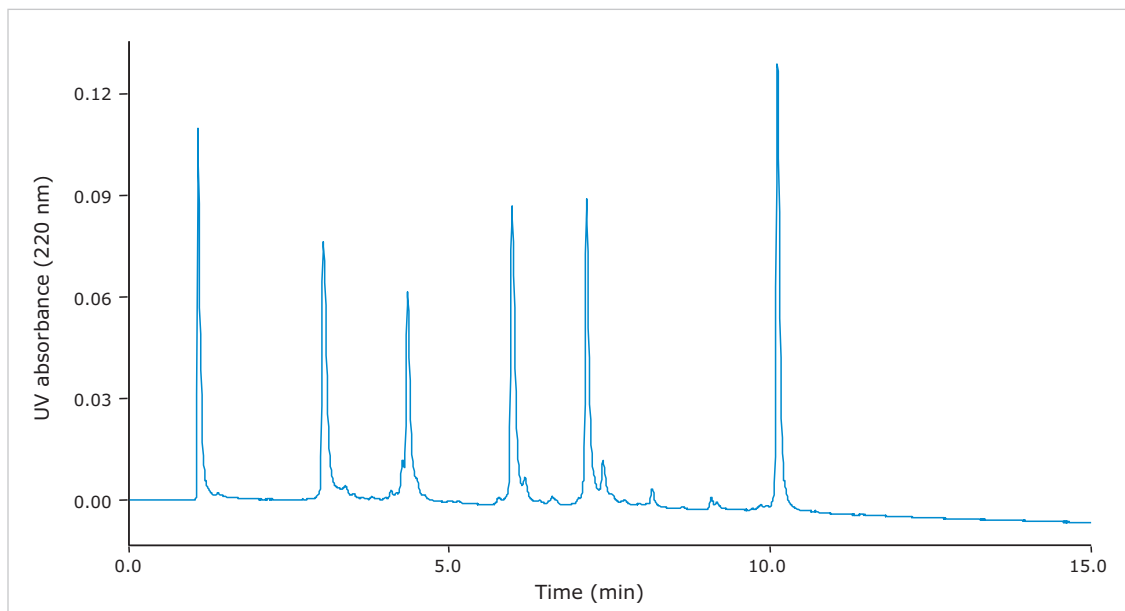


UPLC and ACQUITY UPLC BEH Peptide Columns deliver unparalleled resolution and reproducibility in peptide mapping, here of infliximab (five overlaid chromatograms).



RELIABLE OPERATION UNDER DEMANDING CONDITIONS

Assays utilizing IEX, SEC, and HIC modes of chromatography typically utilize high ionic strength mobile phases containing denaturing agents. The ACQUITY UPLC H-Class PLUS Bio System's bio-inert flow path is made of non-stainless steel and iron-free materials to minimize undesirable protein interactions and maximize system robustness. The result: a system that is ideally suited for routine, trouble-free operation with maximum recovery of biomolecules and consistently high system performance.

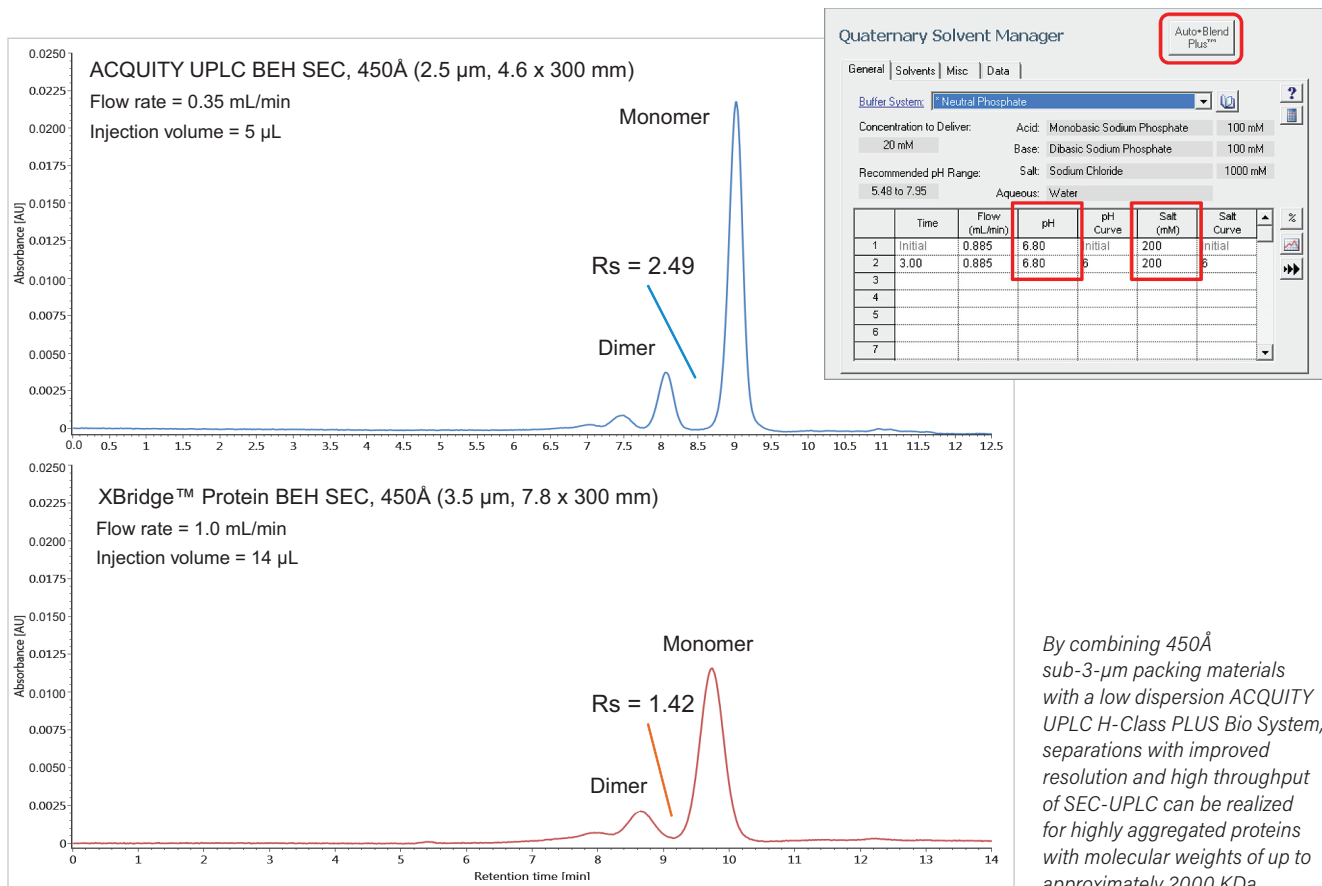


Hydrophobic interaction chromatography separation of six proteins (HIC Protein Standard) by the Protein-Pak™ Hi Res HIC 2.5 μ m, 4.6 x 100 mm Column. Mobile phase A: 2M $(\text{NH}_4)_2\text{SO}_4$ in 50 mM Na_2HPO_4 at pH 6.9; Mobile phase B: 50 mM $\text{Na}_2\text{HPO}_4/\text{Na}_2\text{HPO}_4$ at pH 6.9; Flow rate: 0.6 mL/min; Gradient: 0–100% B in 15 minutes.

ON-DEMAND MOBILE PHASE CREATION

The bioQuaternary Solvent Manager (bioQSM) automatically blends mobile phase combinations and gradients on demand, enabling you to obtain the optimum retention and selectivity requirements for your analysis. Designed with bio-inert materials, the bioQSM accommodates the aqueous, high ionic strength mobile phases and organic solvents used in biopharmaceutical applications.

Auto-Blend Plus technology automatically blends your mobile phase to a specified pH and ionic strength or organic modifier percentage, for an infinite set of analytical conditions. By blending online to the desired pH and ionic strength conditions, you can significantly reduce the number of buffers you need to prepare for method development and routine everyday use.

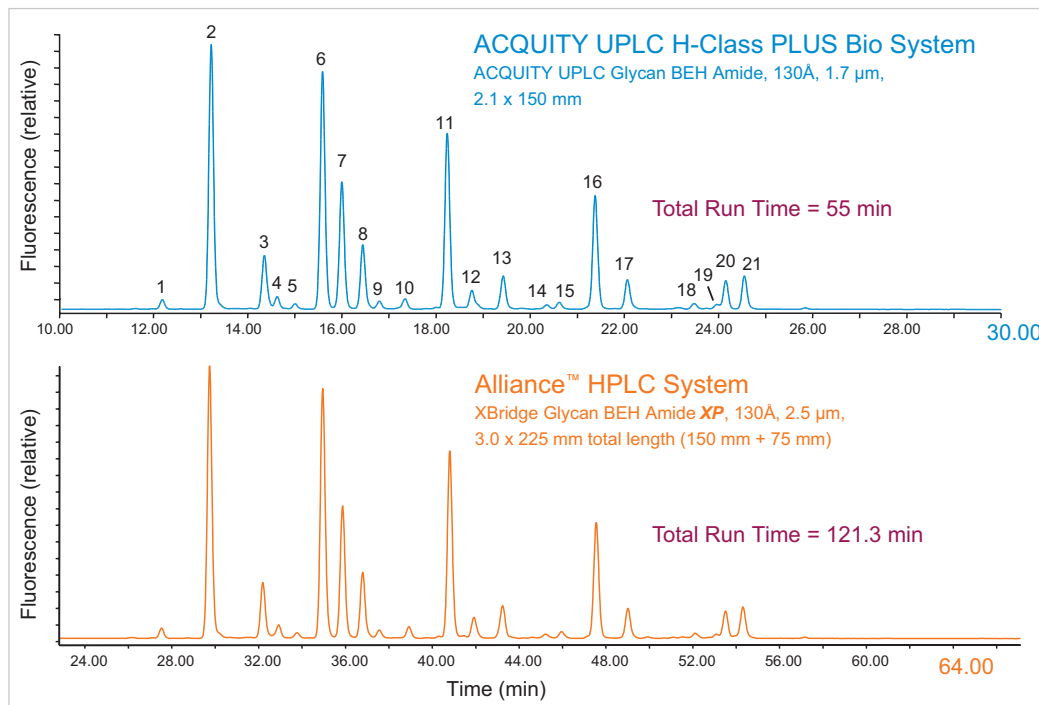


By combining 450Å sub-3-μm packing materials with a low dispersion ACQUITY UPLC H-Class PLUS Bio System, separations with improved resolution and high throughput of SEC-UPLC can be realized for highly aggregated proteins with molecular weights of up to approximately 2000 KDa.

ACCELERATE YOUR PRODUCTIVITY

Adopting a proven analytical technology that improves laboratory efficiency is advantageous for supporting your new projects and products. Designed to support your HPLC, UHPLC, and UPLC methods, the ACQUITY UPLC H-Class PLUS Bio System is the ideal solution to address legacy methods, while enabling the transition to true UPLC performance when you are ready.

- Reproduce established HPLC methods while enabling seamless transfer to UPLC
- Faster methods development with expanded solvent and column capacity and fully scalable column chemistries
- Get results faster with high pressure mixing binary solvent management



Comparison of UPLC and HPLC HILIC separations of RapiFluor-MS™-labeled N-glycans from the Waters Glycan Performance Test Standard diluted in water to a concentration of 20 pmole/µL. Injection volumes of 1.2 and 3.7 µL for UPLC and HPLC analyses.

www.waters.com/hclassbio

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