

SALES OFFICES:

Australia 61 2 9933 1777
Austria 43 1 877 18 07
Belgium and Luxembourg 32 2 726 1000
Brazil 55 11 4134 3788
Canada 1 800 252 4752
China 86 21 6156 2666
Czech Republic 420 2 617 11384
Denmark 45 46 59 8080
Finland 358 9 5659 6288
France 33 1 30 48 72 00
Germany 49 6196 400 600
Hong Kong 852 2964 1800
Hungary 36 1 350 5086
India 91 080 49292200 03
Ireland 353 1 448 1500
Israel 9723 3731391
Italy 39 02 265 0983
Japan 81 3 3471 7191
Korea 82 2 6300 9200
Mexico 52 55 52 00 1860
The Netherlands 31 76 508 7200
Norway 47 6 384 6050
Poland 48 22 101 5900
Portugal 351 21 893 61 77
Puerto Rico 1 787 747 8445
Russia/CIS 7 495 727 4490 / 290 9737
Singapore 65 6593 7100
Spain 34 93 600 9300
Sweden 46 8 555 115 00
Switzerland 41 56 676 7000
Taiwan 886 2 2501 9928
UAE 971 4 214 62 38
UK 44 208 238 6100
US 1 800 252 4752



www.waters.com/glycans

Waters

THE SCIENCE OF WHAT'S POSSIBLE.®

Waters Corporation
34 Maple Street
Milford, MA 01757 U.S.A.
T: 508 478 2000
F: 508 872 1990
www.waters.com

Waters, The Science of What's Possible, ACQUITY UPLC, UPLC, Alliance, ACQUITY, QDa, UNIFI, SYNAPT, Empower, Xevo, MassPREP, and MassLynx are registered trademarks of Waters Corporation. RapiFluor-MS, GlycoWorks, and RapiGest are trademarks of Waters Corporation.

©2015 Waters Corporation. Printed in the U.S.A.
June 2015 720005271EN KP-SIG



The **Next Generation**
of Glycan Sample Preparation
and Analysis

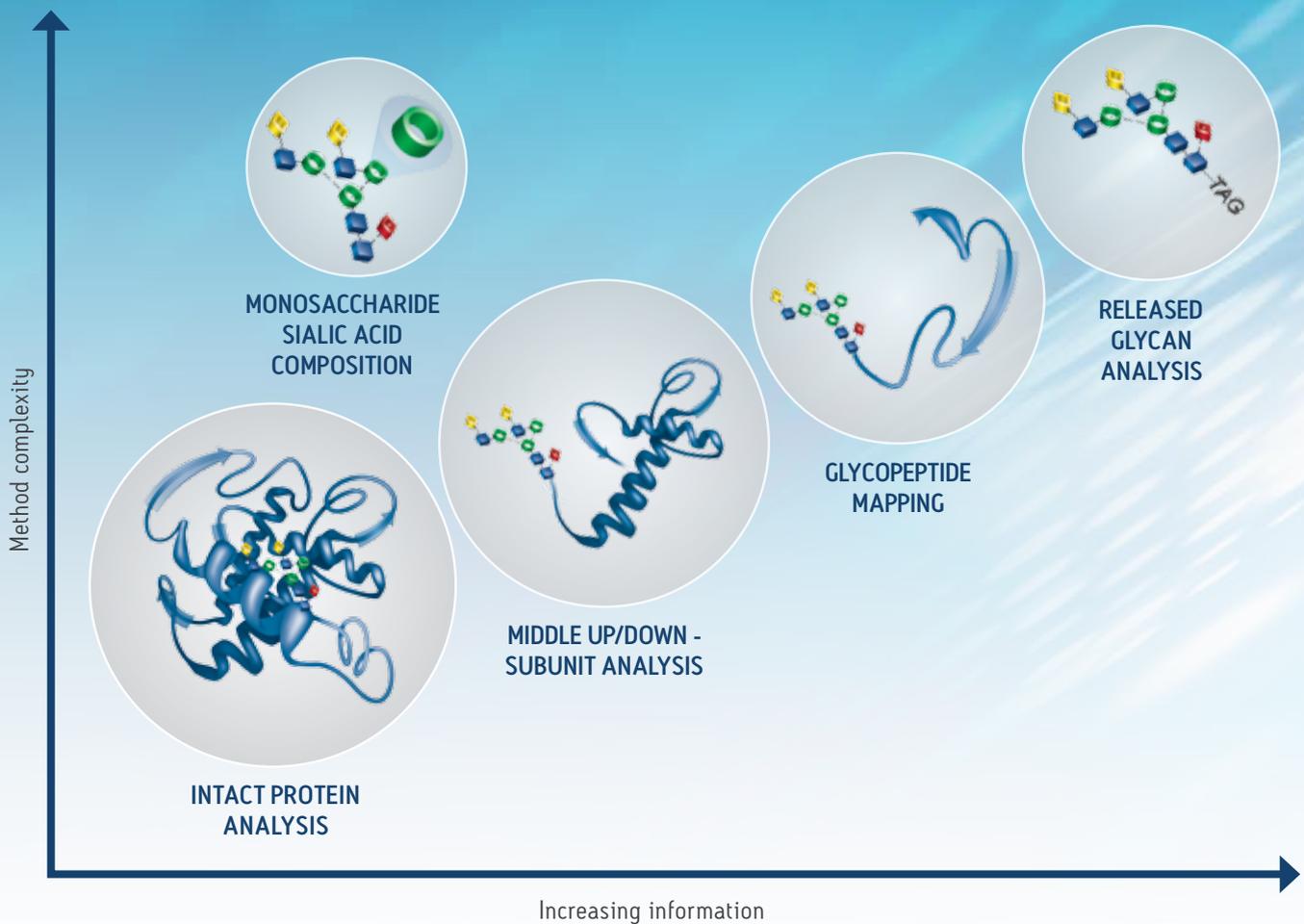
Waters

THE SCIENCE OF WHAT'S POSSIBLE.®

Bringing Together Complementary Techniques to Streamline Glycan Analysis

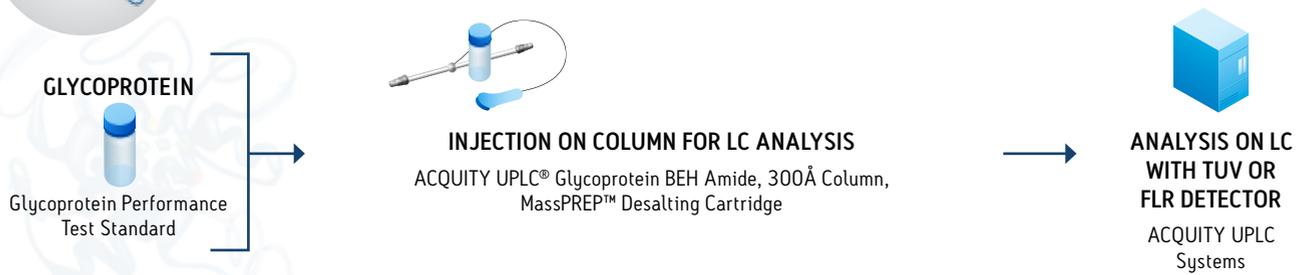
Waters offers complete, workflow-based approaches for analyzing glycoproteins at all structural levels.

- Glycoprotein profiling
- Middle up/down - Subunit analysis
- Glycopeptide mapping
- Released glycan characterization and monitoring
- Monosaccharide/Sialic acid composition

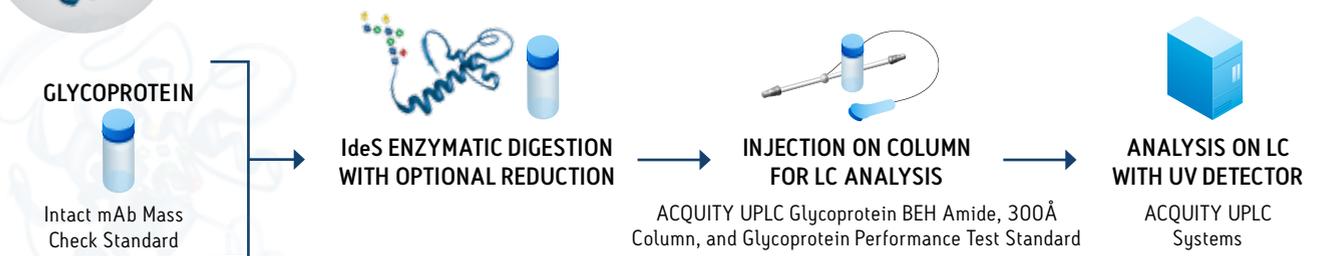




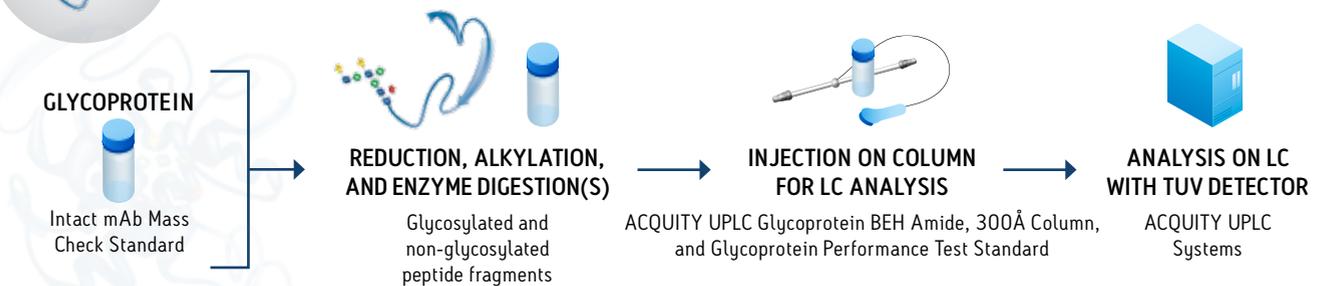
Intact Protein Analysis Workflow



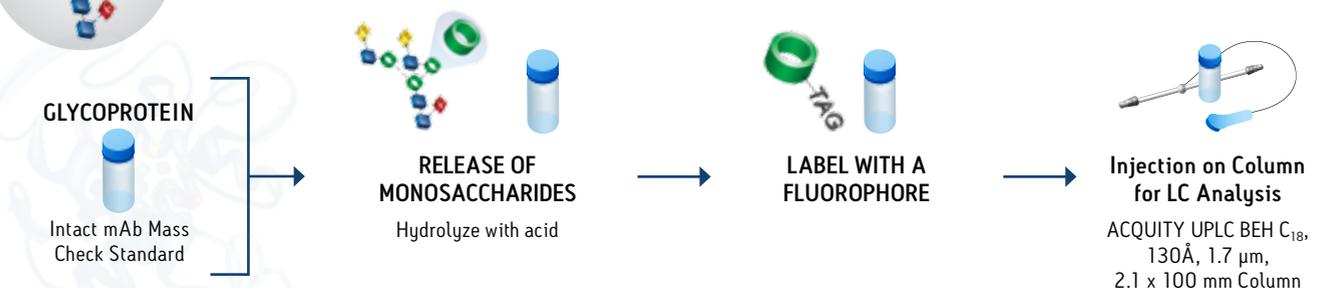
Subunit Analysis Workflow

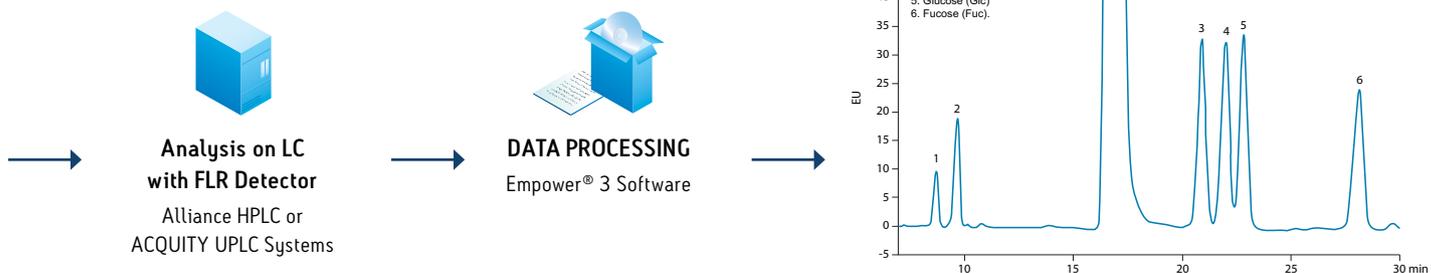
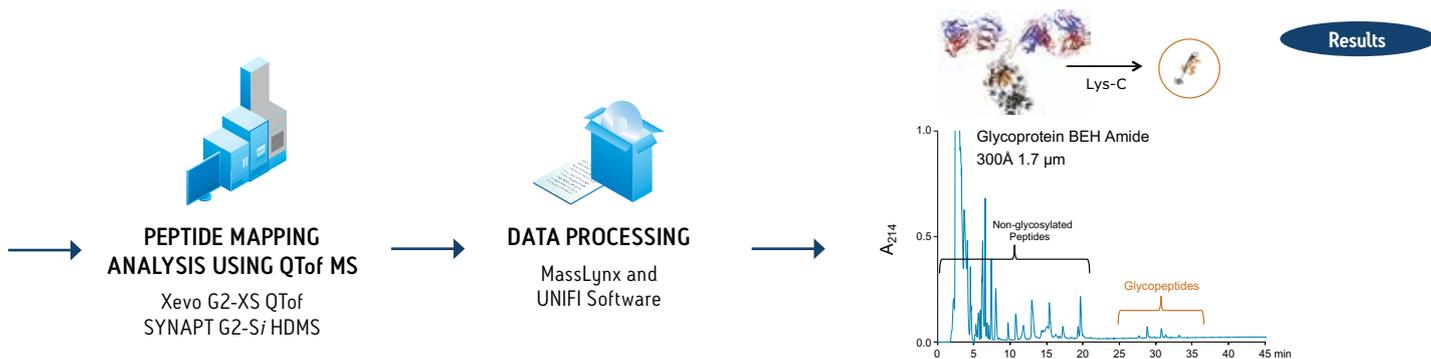
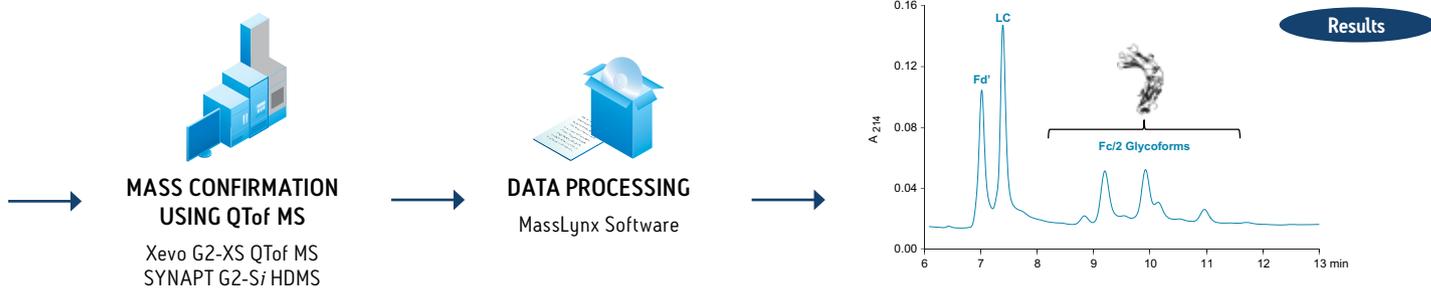
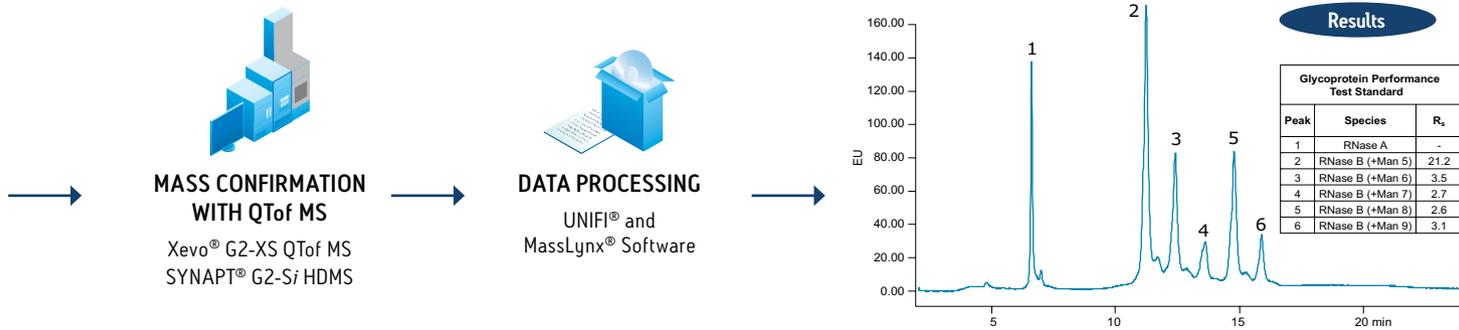


Glycopeptide Mapping Workflow



Monosaccharide/Sialic Acid Composition Workflow





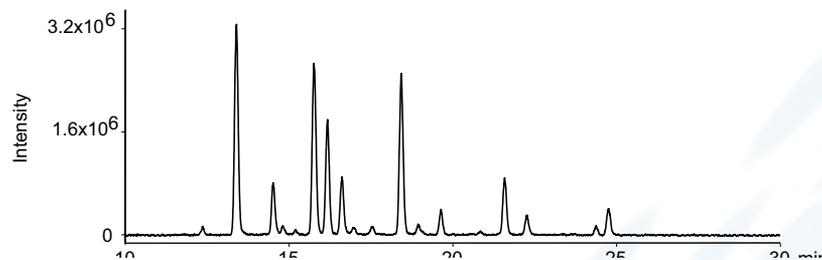
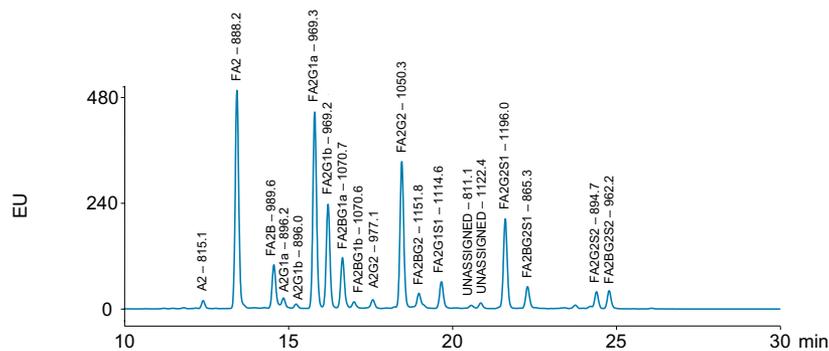
ROUTINE MONITORING

Explore the possibilities

Due to the increased ionization efficiency and higher proton affinity of *RapiFluor*-MS, mass detection of glycans using the ACQUITY QDa Detector is finally possible.

- Provides unrivaled sensitivity for FLR and MS detection.
- Offers greater confidence with mass confirmation of FLR peaks.
- Reduce chromatography analysis times with targeted MS glycan profiling for rapid process development.
- Can be easily integrated with existing GMP-compliant-ready UPLC workflows with Empower 3 Software.

Glycan Monitoring with ACQUITY UPLC H-Class Bio System with FLR and ACQUITY QDa Detection



RapiFluor-MS labeled N-glycans monitored using an ACQUITY UPLC H-Class Bio System configured with FLR and ACQUITY QDa mass detection for confirmation of known structures and mass data for unassigned peaks.



What if...

released N-glycan analysis could be
both streamlined **and** highly sensitive?

Finally, a smart workflow with no compromises.

Introducing the GlycoWorks *RapiFluor*-MS N-Glycan Kit

Waters, the leader in innovations for biopharmaceutical analysis, has reimagined the workflow for released N-glycan analysis. Our new reagent, *RapiFluor*-MS™ features the ionization capability necessary to maximize the information generated by MS detection. Our new workflow speeds up deglycosylation and streamlines labeling.

It's the smart workflow that biopharmaceutical laboratories have been waiting for—you no longer have to choose between a “quick” labeling tool and sensitivity for mass spectrometry; no more labor-intensive and complicated processes that leave room for error.

With Waters, there are no compromises between speed and sensitivity in sample preparation—only gains in confidence in your analytical results.



Join Waters in thinking outside the box
for released glycan analysis.

SPEED/THROUGHPUT



FLR QUANTIFICATION



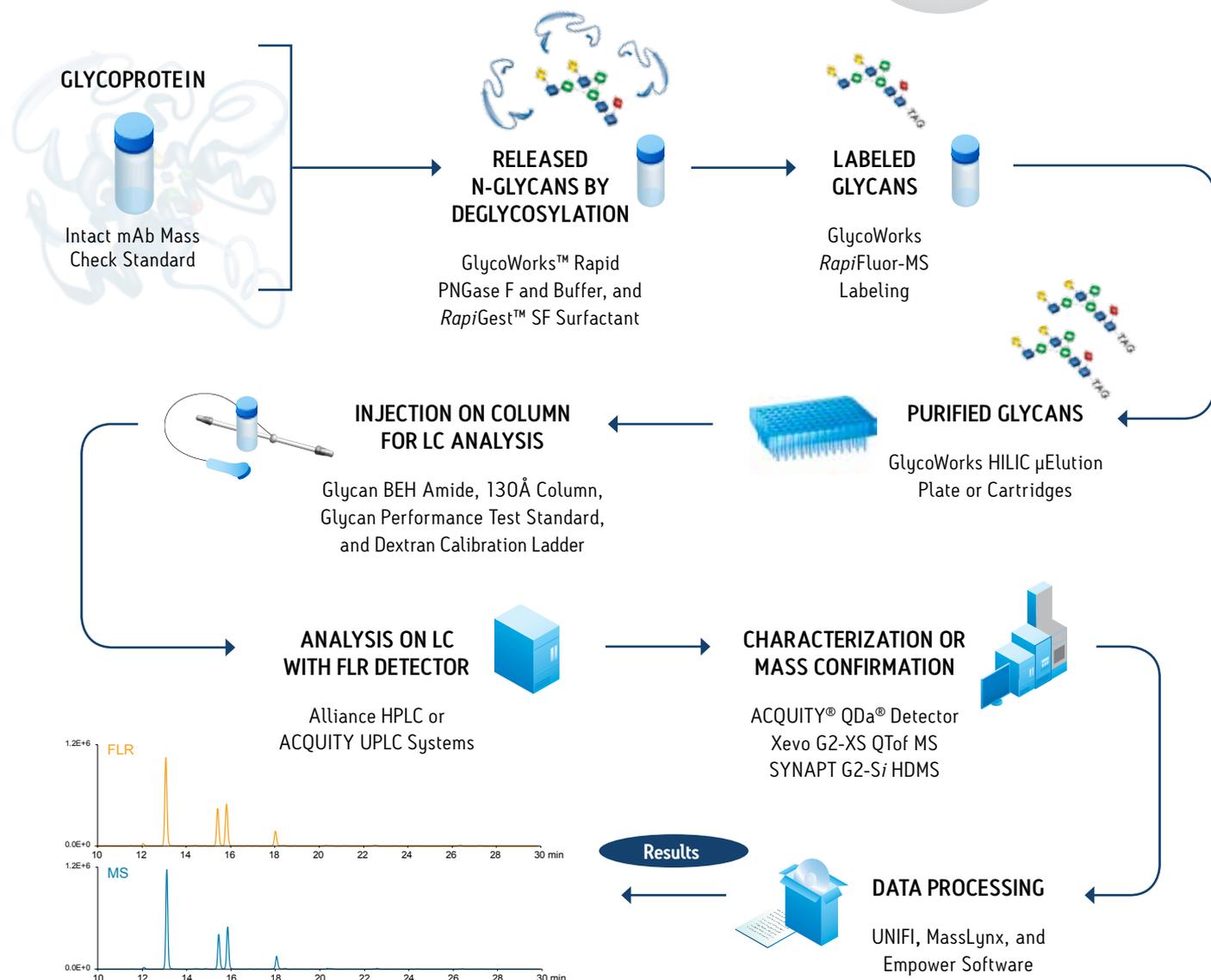
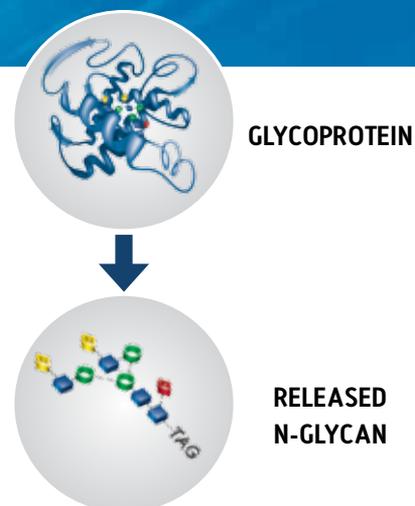
MS PERFORMANCE



How does it work?

Released N-glycan analysis is an information-rich technique, but it has involved complicated sample preparation procedures. Once glycans are released by PNGase F, labeling is required for effective separation and detection. Using Waters' new protocol, you now have a versatile workflow for:

- Glycan identification
- Glycan structure
- Glycan monitoring

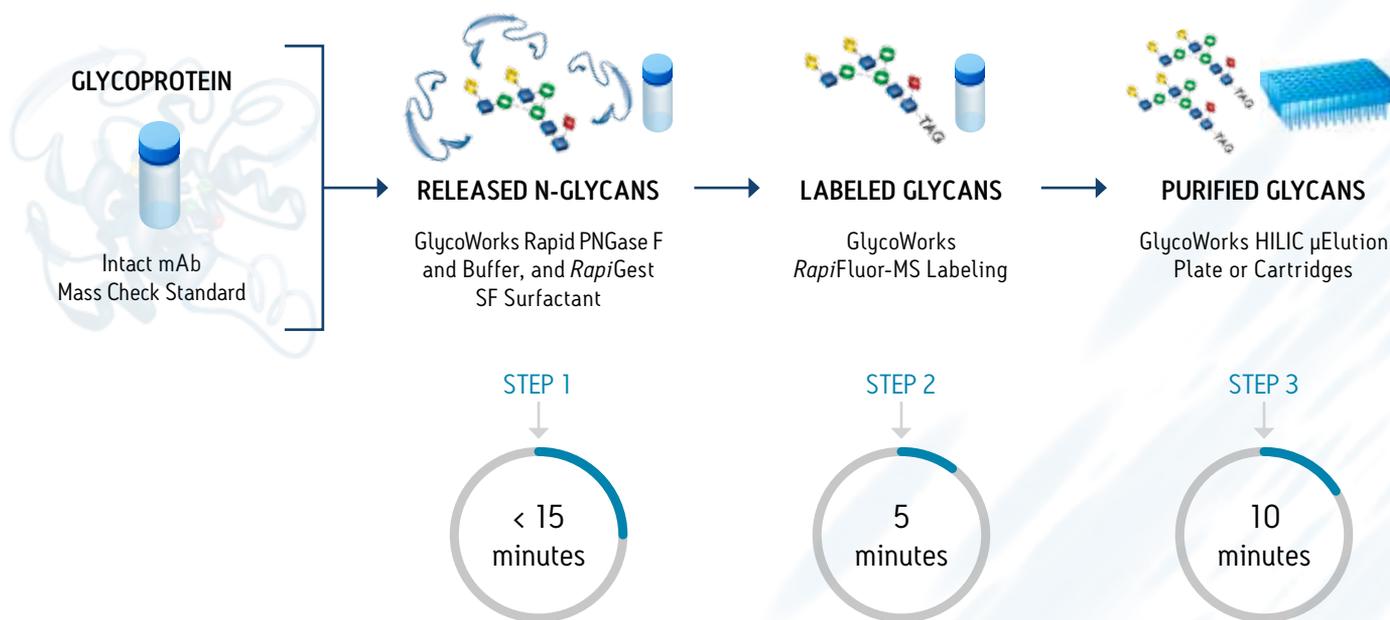


See the science behind our **NEW GlycoWorks RapiFluor-MS Reagent**, which enables new capabilities for glycan analysis, monitoring and characterization. Watch our video at waters.com/SeeTheScience

What if released N-glycan sample preparation was fast and simplified?

- Easily and quickly prepare labeled released N-glycan samples.
- Minimize error and sample loss.
- Easily train analysts and transfer methods throughout your organization.

3 STEPS, 30 MINUTES



Watch a short 2 minute RapiFluor-MS
N-Glycan Kit demonstration video.

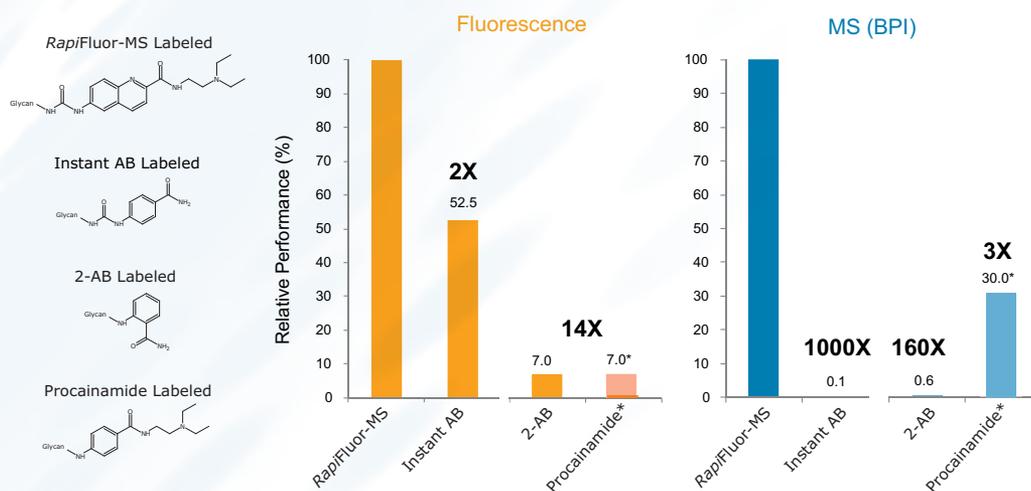
www.waters.com/RapiFluorMS



What if you could obtain unrivaled FLR and MS sensitivity?

- Improve product quality understanding with in-depth characterization of previously unidentified peaks with fluorescence quantification obtained with equivalent mass spectral response.
- Accelerate decision making.
- More easily identify low abundance N-linked glycans.

UNRIVALED SENSITIVITY



14x fluorescence and 160x mass spectral response when compared to traditional labels (2-AB and procainamide). 2x fluorescence and 1,000x mass spectral response when compared to instant labels.

*Based on published theoretical values.

See how you can bring extraordinary possibilities to your everyday analysis.

www.waters.com/XevoG2XS

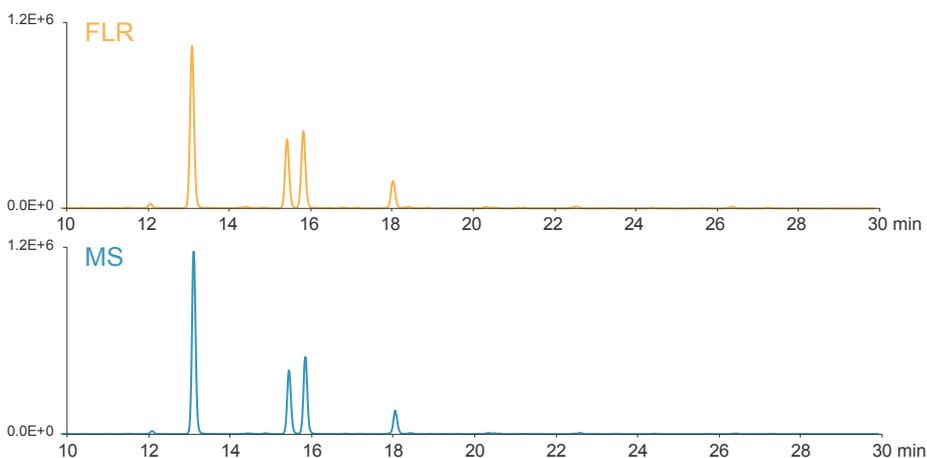


What if mass data was easily and always available for routine glycan analysis?

- Increase confidence in glycan profile monitoring with routine mass detection.
- Obtain information about manufacturing changes with quick sample turnaround.
- Resolve method development and transfer issues quickly.

CONFIDENCE

Detailing the N-glycan Profile of a mAb



The increased ionization efficiency of RapiFluor-MS allows for quantitative fluorescence paired with mass detection with the ACQUITY QDa Detector.

Watch a short 1 minute video on how you can bring the power of mass detection to your lab.

www.waters.com/QDa



Ordering Information

Released N-Glycan Sample Preparation Complete Kits

Description	Part No.
GlycoWorks RapiFluor-MS N-Glycan Starter Kit - 96 Sample Kit contains: GlycoWorks Deglycosylation Module, GlycoWorks Labeling Module, GlycoWorks Clean-up Module, GlycoWorks Sample Collection Module, ACQUITY UPLC Glycan BEH Amide, 1.7 µm, 2.1 x 150 Column, Mobile Phase Concentrate: Ammonium Formate	176003635
GlycoWorks RapiFluor-MS N-Glycan Kit - 96 Sample Kit contains: GlycoWorks Deglycosylation Module, GlycoWorks Labeling Module, GlycoWorks Clean-up Module, GlycoWorks Sample Collection Module	176003606
GlycoWorks RapiFluor-MS N-Glycan Starter Kit—24 sample Kit contains: GlycoWorks Deglycosylation Module (24 sample), GlycoWorks Labeling Module (24 sample), GlycoWorks Clean-up Module, GlycoWorks Sample Collection Module, ACQUITY UPLC Glycan BEH Amide, 1.7 µm, 2.1 x 150 mm Column, Ammonium Formate Solution – Glycan Analysis	176003712
GlycoWorks RapiFluor-MS N-Glycan Kit—24 sample Kit contains: GlycoWorks Deglycosylation Module (24 sample), GlycoWorks Labeling Module (24 sample), GlycoWorks Clean-up Module, GlycoWorks Sample Collection Module	176003713
GlycoWorks RapiFluor-MS N-Glycan Refill Kit—24 sample Refill Kit contains one of each: GlycoWorks Deglycosylation Module (25 sample) and the GlycoWorks Labeling Module (24 sample)	176003714

Released N-Glycan Standards and Accessories

Description	Part No.	Description	Part No.
Vacuum Manifold Shims* 3/set	186007986	96-Well Plate Extraction Manifold 1	186001831
Positive Pressure Manifold Spacer for the GlycoWorks RapiFluor-MS N-Glycan Kit* 1/pack	186007987	Vacuum Pump 220 v/240 v 50 Hz	725000604
RapiFluor-MS Dextran Calibration Ladder 50 µg/vial	186007982	Positive Pressure Manifold 1	186006961
RapiFluor-MS Glycan Performance Test Standard 400 pmol total/vial	186007983	Modular Heat Block for 1 mL Tubes 1 mL tubes/96 wells	186007985
RapiGest SF 10 mg vial	186002123	GlycoWorks Rapid Buffer—5 mL	186008100
Ammonium Formate Solution – Glycan Analysis 5000 mM	186007081	RapiGest SF 3 mg vial	186008090
Intact mAb Mass Check Standard**	186006552	ACQUITY UPLC Glycan BEH Amide, 1.7 µm, 2.1 x 150 mm Column	186004742

*Essential for kit use

**Control Standard included in kit

Glycoprotein Columns and Standard

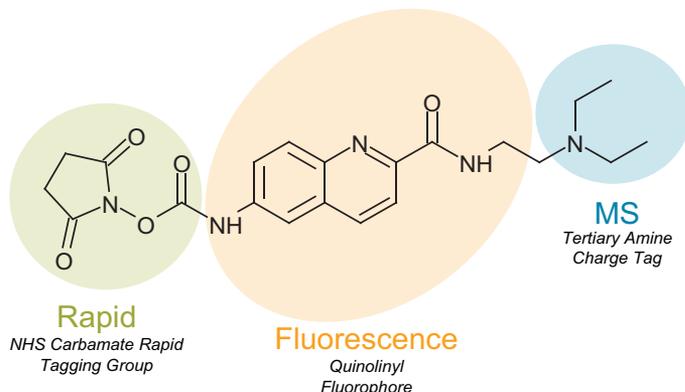
Description	Pore Size	Particle Size	Dimensions	Part No.
ACQUITY UPLC Glycoprotein BEH Amide and Std.	300Å	1.7 µm	2.1 x 5 mm Guard 3/pk with Std.	176003699
ACQUITY UPLC Glycoprotein BEH Amide and Std.	300Å	1.7 µm	2.1 x 50 mm with Std.	176003700
ACQUITY UPLC Glycoprotein BEH Amide and Std.	300Å	1.7 µm	2.1 x 100 mm with Std.	176003701
ACQUITY UPLC Glycoprotein BEH Amide and Std.	300Å	1.7 µm	2.1 x 150 mm with Std.	176003702
ACQUITY UPLC Glycoprotein BEH Amide and Std.	300Å	1.7 µm	2.1 x 100 MVK, 3/pk with Std.	176003703
Glycoprotein Performance Test Standard				186008010

The next generation of glycan labeling

Built upon Waters' expertise in rapid fluorescence labeling of amino acids, *RapiFluor-MS* is designed with enhanced chemical properties for superior glycan analysis. Within a 5-minute reaction, *RapiFluor-MS* modifies glycosylamines generated by enzymatic release from a glycoprotein.

- Rapid tagging
- Efficient fluorescence
- Unrivaled mass spectral response

RapiFluor-MS Reagent



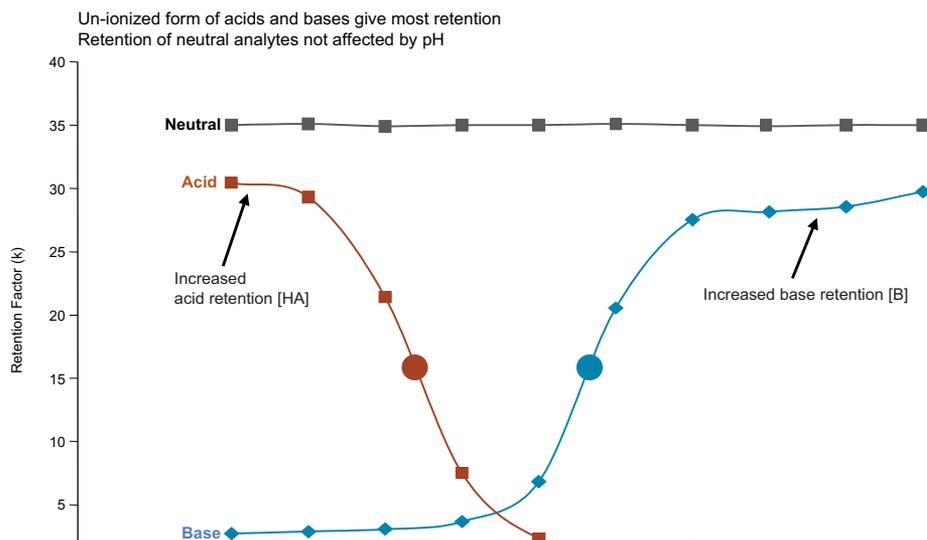
GlycoWorks *RapiFluor-MS*

CHARACTERIZATION

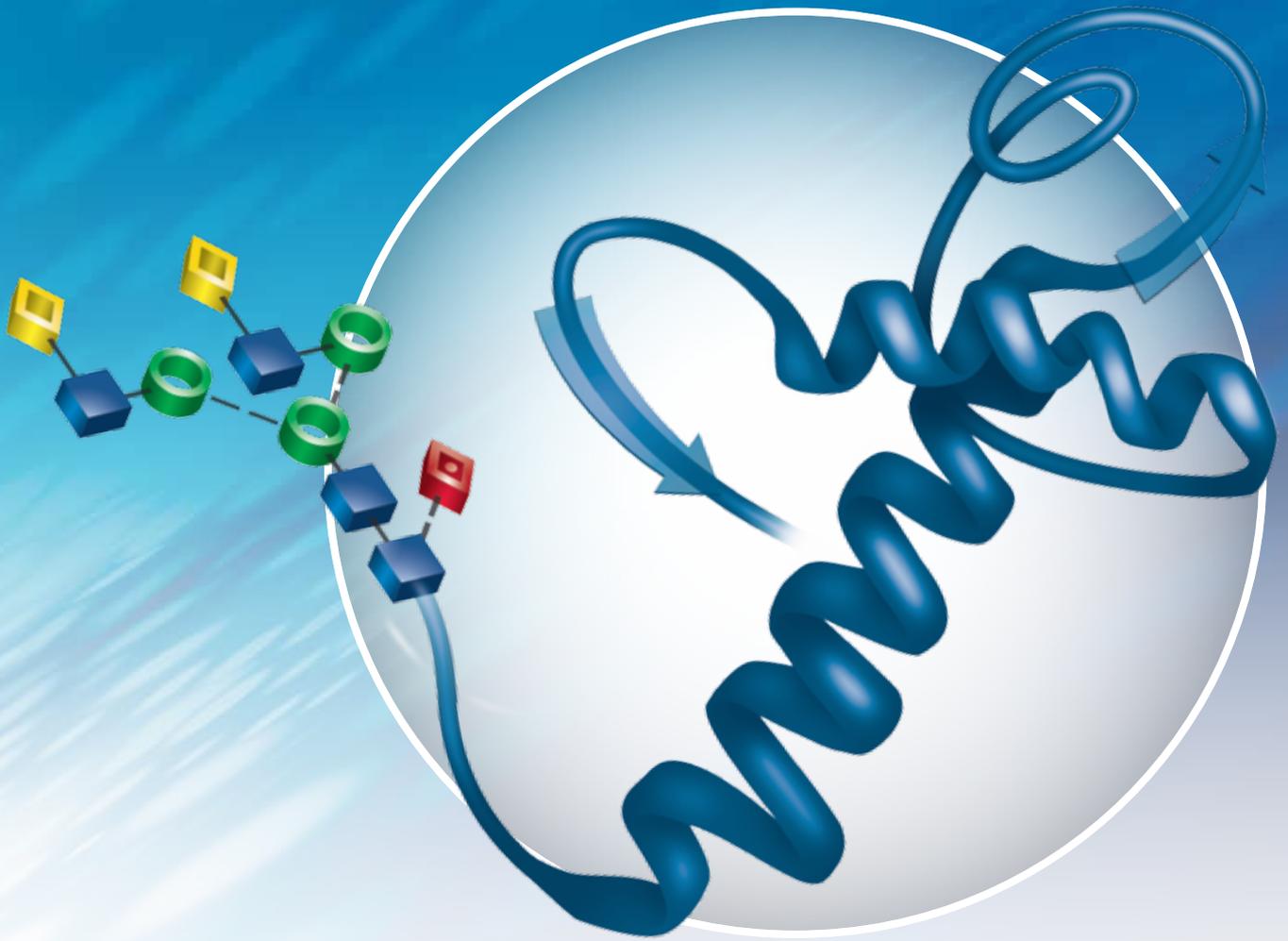
Assign low-level glycan components with more ease and confidence

Achieve unparalleled levels of MS and MS/MS sensitivity structural assignments by combining *RapiFluor-MS* with the best-in-class Xevo G2-XS QToF or SYNAPT G2-Si HDMS Mass Spectrometers.

Glycan Characterization by UPLC® FLR with Xevo G2-XS QToF Mass Spectrometer



Comparison of LC-MS chromatogram of 2AB-labeled *N*-glycans versus *RapiFluor-MS* labeled *N*-glycans from the same mAb. 100 fold greater ESI+ MS response was observed for *RapiFluor-MS* labeled sample. An MS spectrum (inset) shows the summed spectrum for a low abundance glycan within the sample.



What if...

identifying **WHERE** glycans are present on a glycoprotein becomes part of your routine workflow?

Introducing the ACQUITY UPLC Glycoprotein BEH Amide, 300Å, 1.7 μm Column

You need to know **WHAT** your glycan structures are, **WHY** not also know **WHERE** they are.....

With Waters, now you can combine approaches for comprehensive characterization. The ACQUITY UPLC® Glycoprotein BEH Amide 300Å Column's wide pore stationary phase and optimized amide bonding, provides unprecedented, MS compatible HILIC-based separations for the analysis of intact glycoproteins, glycoprotein fragments, and glycopeptides.

This new, patent pending column technology allows access to information about:

- Site-specific glycan structures
- Glycan occupancy

One column that brings separation opportunities never seen before...

