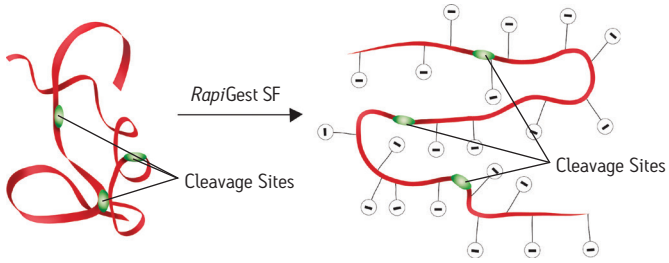
Waters
THE SCIENCE OF WHAT'S POSSIBLE.®

*Rapi*Gest SF Protein Digestion Surfactant

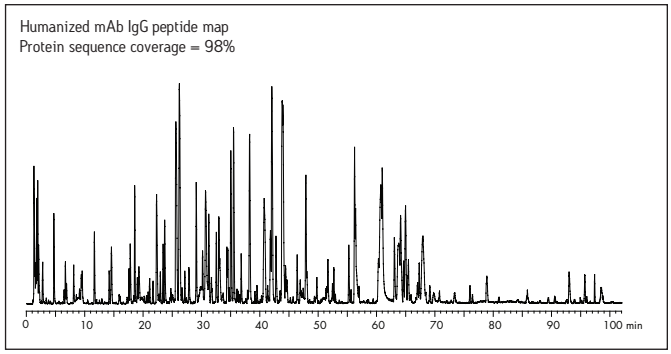
Waters patented* *Rapi*Gest™ SF (surfactant) radically enhances protein enzymatic digestions in terms of speed and percent recovery. *Rapi*Gest is a patented anionic surfactant that accelerates the in-solution production of peptides generated by proteases, such as trypsin, Asp-N, Glu-C, and Lys-C. Many hydrophobic proteins are resistant to proteolysis because their cleavage sites are inaccessible to endoproteases. *Rapi*Gest, a mild denaturant, helps solubilize and unfold proteins making them more amenable to cleavage without denaturing or inhibiting common proteolytic enzymes.

- Improves solubility of hydrophobic proteins for improved enzymatic digest
- Compatible with various enzymes and does not cause protein modifications
- Does not inhibit enzyme activity, unlike conventional denaturants
- Reduces the digestion time and requires less enzyme to achieve optimum digestion
- Improves the digestion of enzyme resistant proteins such as membrane proteins
- Acid labile and the degradation products from *Rapi*Gest do not interfere with LC-MS or MALDI MS analysis

How *Rapi*Gest Works

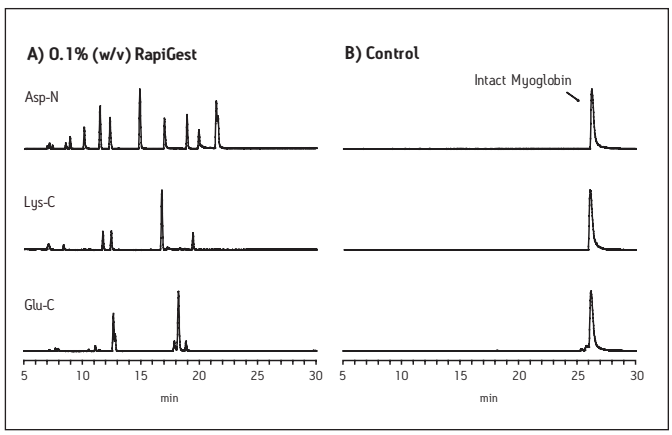


UPLC/MS Analysis of Trypsin Digested mAb in the Presence of 0.1% *Rapi*Gest



*A human mAb IgG sample was solubilized in 0.1% Rapi*Gest *(w/v) during the reduction (DTT) and alkylation (iodoacetamide) steps that proceeded overnight trypsin digestion. Rapi*Gest *enhances the protein solubilization, therefore, improving the overall sequence coverage. Since Rapi*Gest *is rapidly degraded by mixing the digested sample with 1% formic acid (1:1 volume), direct sample injection onto a Waters Peptide Separation Technology C_{18} Column is possible without affecting the quality of the LC/MS analysis.*

1 Hour Proteolysis of Myoglobin Using Various Endoproteases

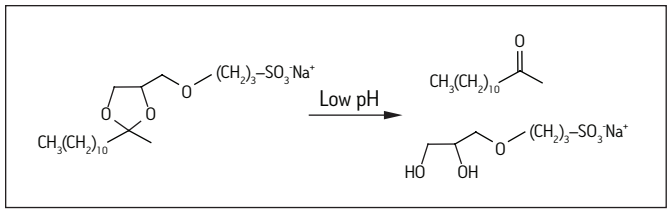


Hundreds of published scientific articles and presentations have documented the benefits of using *Rapi*Gest for improving the protein sequence coverage and reducing the sample preparation time. *Rapi*Gest's application areas are diverse, ranging from proteomic research to therapeutic protein characterization, and it is effective for in-solution digestion protocols.

*Rapi*Gest shows significant advantage over other denaturants since it is not disruptive to endoprotease activity

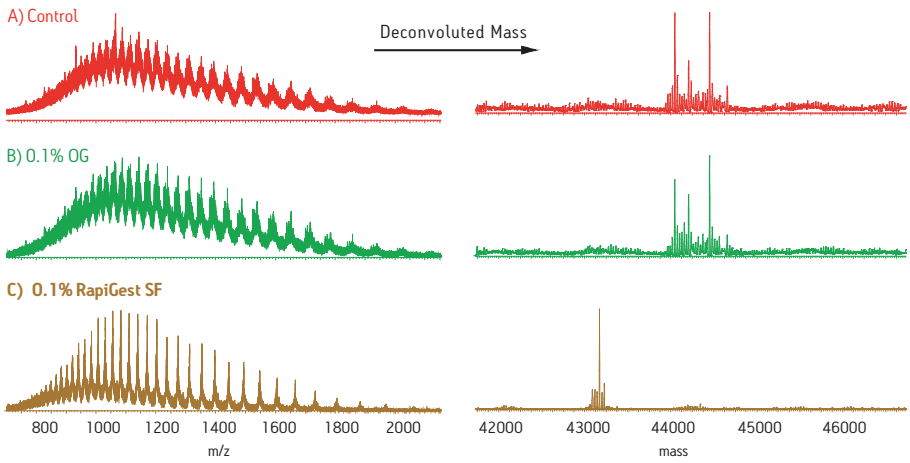
Trypsin[1] Solution	Trypsin Activity (%)[2]	Trypsin[1] Solution	Trypsin Activity (%)[2]
No additive	**100**	0.1% SDS/0.1% *Rapi*Gest	67
0.1% *Rapi*Gest	**100**	50% Methanol	59
0.5% *Rapi*Gest	**100**	50% Acetonitrile	87
0.1% SDS	24	1M Urea	97
0.5% SDS	1	2M Urea	83

1 0.5 µg of trypsin in 50 mM ammonium bicarbonate, pH 7.9; 0.2 mM of BEAA.
2 Measured as delta BEAA absorbance @ 253 nm (slope within 5 min).



*Rapi*Gest *hydrolyzes under acidic condition (half life time = 7.6 minutes at pH 2). Therefore, it is compatible with LC/MS and MALDI MS analysis.*

Use of *Rapi*Gest SF to Assist in Protein Deglycosylation



*LC/MS spectra of deglycosylated ovalbumin are shown. A) Ovalbumin was solubilzed without the use of denaturant, and was not deglycosylated. B) Ovalbumin was denatured using 0.1% n-octyl-b-glycopyranoside (OG) and deglycosylated. C) Ovalbumin was denatrued in 0.1% Rapi*Gest *SF solution and deglycosylated. The MS scans were deconvoluted to the MW of the protein. Complete deglycosylated was observed after 2 hours deglyco-sylation for the Rapi*Gest *SF solubilized ovalbumin.*

ORDERING INFORMATION

Description	Part No.
*Rapi*Gest SF 1 mg vial	186001860
*Rapi*Gest SF 1 mg vial (5 pack)	186001861
*Rapi*Gest SF 10 mg vial	186002123
*Rapi*Gest SF 50 mg vial	186002122
*Rapi*Gest SF Custom	186002118

** US 7,229,539 and US 8,580,533*

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