

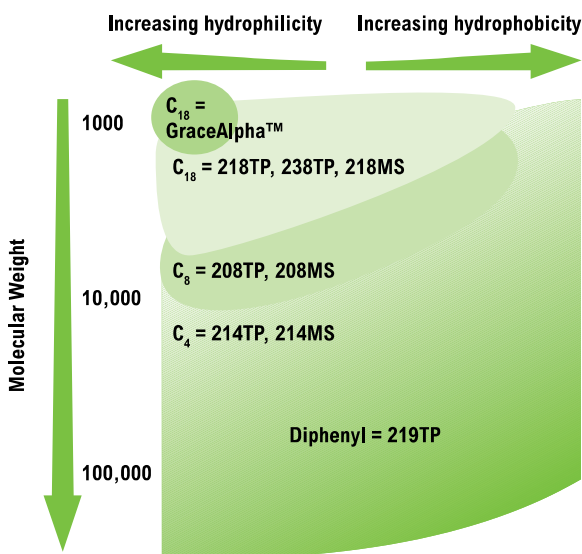
Vydac® Large Molecule Columns

Vydac® has always been a trusted name in bioseparations, now, with technology acquired by Grace over the past few years, we have expanded this expertise further. New Grace® large molecule columns range from nano, capillary to micro, analytical to preparative columns.

Separate biomolecules from small peptides to large intact proteins with the Vydac® family of products which includes reversed-phase, normal-phase, ion-exchange, and affinity phases. Our extensive applications library offers solid method development guidance, and our technical experts provide insight to even the most unusual separation challenges. Whether your primary analysis consideration is speed, MS compatibility, resolution, or recovery, we have a solution.

Column Selection for Polypeptides

The reversed-phase column for a polypeptide separation should be selected based on the hydrophobicity of the polypeptide being chromatographed and molecular weight as a secondary consideration.



Phase	Simple Enzymatic Digests (<12 proteins)	Complex Enzymatic Digests (>12 proteins)	Biomolecules 0-5K MW	Biomolecules 5-10K MW	Biomolecules >10K MW	Un-denatured, Intact Proteins	Antibodies	Oligonucleotides	Oligosaccharides	Comments
218MS (C18) See page 85-87	●		●							Polymeric bonding highest hydrophobic interaction and unique geometric selectivity
238MS (C18) See page 85-87	◐		●							Monomeric bonding offers increased peptide interaction and generally yields higher peak counts. Different selectivity compared to 218MS.
208MS (C8) See page 85-87				●				◐		Lower hydrophobicity is better for larger molecules
214MS (C4) See page 85-87					●	●	●	●		Ideal for hydrophobic proteins, or when minimal organic is desired
219MS (Diphenyl) See page 85-87			◐	◐	◐		◐			Lowest capacity, highly selective for proteins with aromatic sidechains
Everest® C18 See page 88-89		●							●	Maximum surface coverage for highest resolution of complex samples
ProZap™ See page 93-94				◐	●	●	●	●	●	Sub 2µm, in Expedite™ format optimized for fast analysis
218TP (C18) See page 90-92	◐		◐							First generation media with extensive applications library
214TP (C4) See page 90-92					◐	◐	◐			First generation media with extensive applications library

related products

Looking for large molecule prep columns?

See pages 156-161.

Vydac® MS Introduction

New Generation Columns with Unsurpassed Resolution, Sensitivity, and Recovery

- Unique selectivity reveals peaks otherwise masked by other C18 columns
- Excellent peak shape with little or no TFA
- High protein recoveries make scale-up easy

Vydac® MS columns are the latest development in the ongoing effort to provide the best reversed-phase HPLC columns for biomolecule. A surface treatment and proprietary bonding process gives Vydac® MS columns a unique selective not found anywhere else. A variety of reversed phases makes this product line suitable for small peptides to large intact, undenatured proteins.

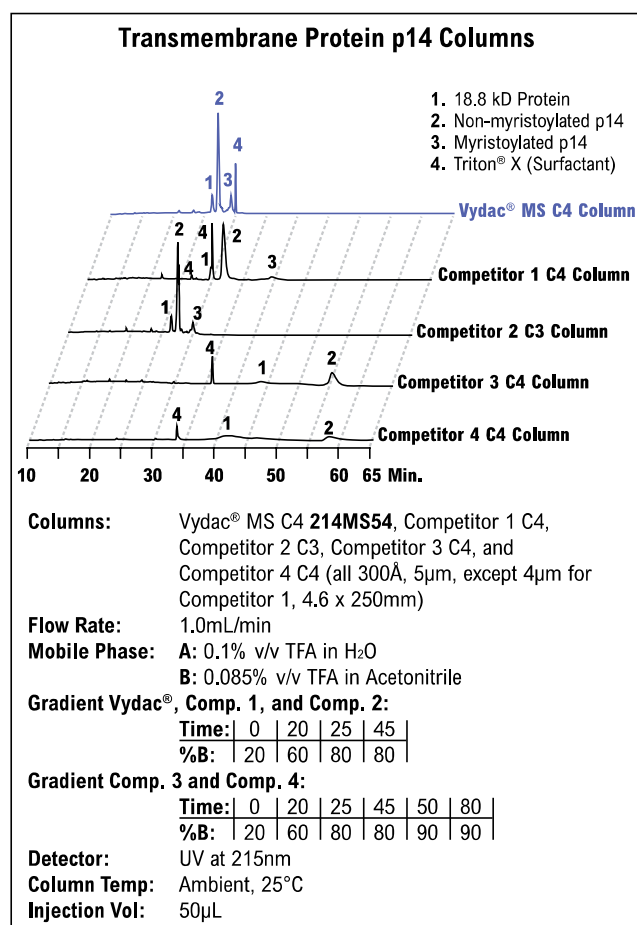
VYDAC


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MS Specifications									
Phase	Base Material	Particle Shape	Particle Size	Pore Size	Surface Area	Carbon Load	Phase Type	Endcapped?	USP L-code
208MS C8	Silica	Spheroidal	5µm	300Å	70m ² /g	5%	Polymeric	Yes	L7
214MS C4	Silica	Spheroidal	5µm	300Å	70–110m ² /g	3%	Polymeric	Yes	L26
218MS C18	Silica	Spheroidal	3, 5, 10, 10–15µm	300Å	60–110m ² /g	8%	Polymeric	Yes	L1
238MS C18	Silica	Spheroidal	5µm	300Å	70m ² /g	4%	Monomeric	Yes	L1
219MS Di-Phe	Silica	Spheroidal	5µm	300Å	70m ² /g	4%	Polymeric	Yes	—

Unique Selectivity

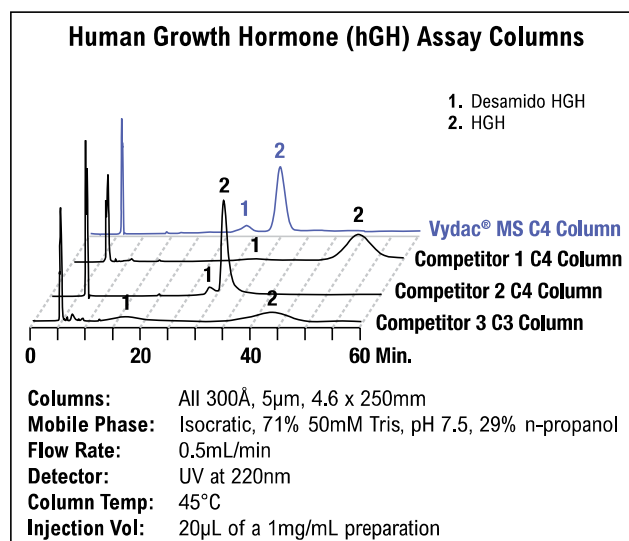
A sample of bovine fetuin, a 36kD glycoprotein, was digested with trypsin. Some of the sample components interfere with the peptide separation on the Competitor 1 and Competitor 2 columns and appear as a chromatographic “hump” with peaks riding on top. The unique selectivity of Vydac® MS columns solves these separation problems



Reptilian reovirus RRV p14 sample courtesy of Drs. Roberto J. de Antuano and Roy Duncan, Dalhousie University, Halifax, Nova Scotia.

Unsurpassed Resolution and Peak Symmetry

Vydac® MS C4 columns provide the overall best performance for hGH and desamido hGH analysis. Competitive columns show significant, undesirable interaction of hGH with the stationary phase.



more info

For additional protein and peptide applications, see application section pages 429–441.

more applications

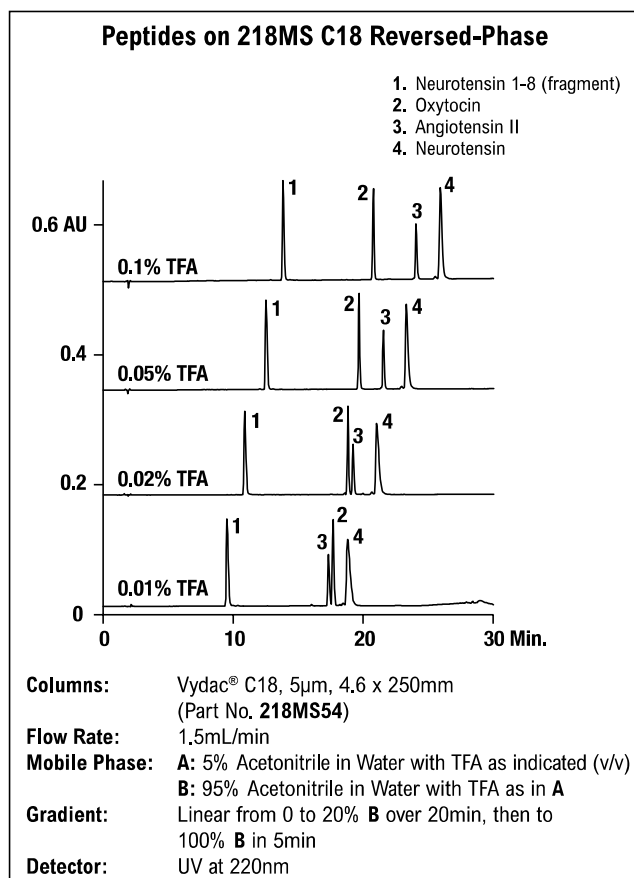
To view our complete searchable chromatogram database visit www.discoverysciences.com/chromdb/



Vydac® MS Columns

Excellent Peak Shape with Little or No TFA

It is common practice for protein and peptide separations to include an acidic modifier such as TFA in the mobile phase. TFA masks basic entities, reducing mixed-mode retention, and improving peak symmetry. TFA also changes retention and selectivity for different analytes, and its concentration can be adjusted to optimize a separation. Unfortunately TFA is UV absorbent and contributes background at low UV wavelengths. Also It is especially problematic with electrospray MS where it interferes with ion generation, called "quenching", and reduces MS sensitivity.



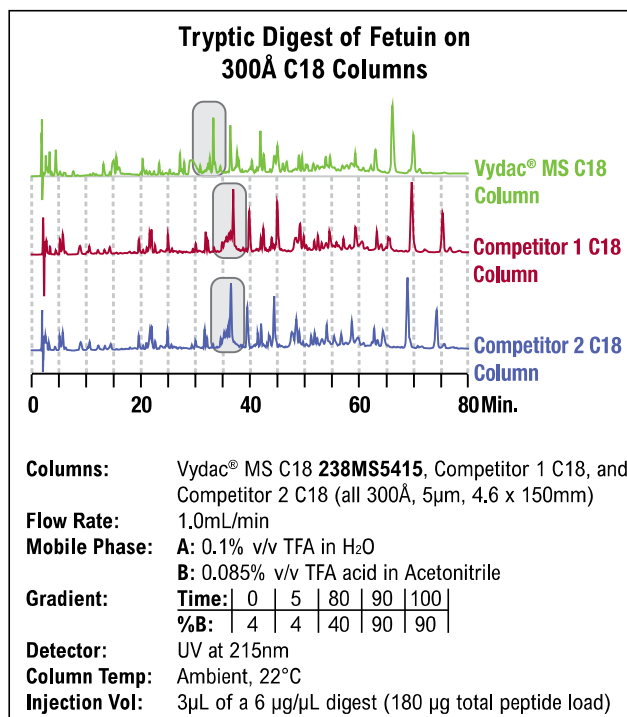
more applications

To view our complete searchable chromatogram database visit www.discoverysciences.com/chromdb/



Hydrophobic Proteins

Transmembrane proteins are hydrophobic proteins which bind to cell membranes and are particularly difficult to separate. Vydac® MS columns provide excellent selectivity and peak shape for these molecules. In this case, a hydrophobic transmembrane protein was separated from a synthetic myristoylated derivative and other cellular components.

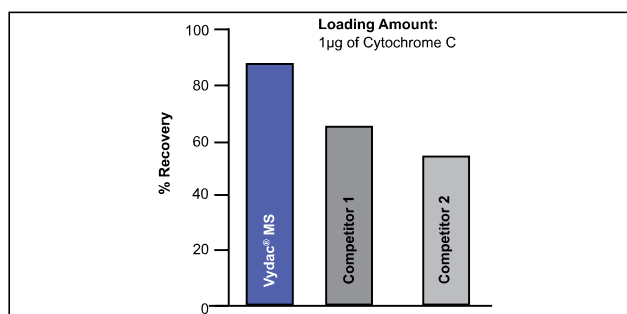


The Vydac® column provides better separation and recovery for a highly hydrophobic membrane protein (RRV p14) and its fatty acid modified (myristoylated) form, a component of a potentially new vaccine delivery system.

High Protein Recovery for Higher Sensitive, Ideal for Preparative Chromatography

Surface chemistry reduces adsorption of proteins for higher recoveries and also increases mass loading.

% Recovery at Low Protein Load: Vydac® MS C4 vs. 2 Competitors



Vydac® MS C4 column provides more than 20% more loading of Cytochrome C.



Vydac® MS Columns

Vydac® MS Analytical Columns

Particle Size	Columns					Recommended Guards	
	i.d.	50mm	100mm	150mm	250mm	Guard Kit ¹	Guard Cartridge ²
214 MS C4							
5µm	1.0mm	214MS5105	214MS5110	214MS5115	214MS51	214GK51MS	214GD51MS
	2.1mm	214MS5205	214MS5210	214MS5215	214MS52	214GK52MS	214GD52MS
	3.2mm	—	—	—	214MS53	214GK54MS	214GD54MS
	4.6mm	214MS5405	214MS5410	214MS5415	214MS54	214GK54MS	214GD54MS
208 MS C8							
5µm	1.0mm	208MS5105	208MS5110	208MS5115	208MS51	208GK51MS	208GD51MS
	2.1mm	208MS5205	208MS5210	208MS5215	208MS52	208GK52MS	208GD52MS
	3.2mm	—	—	—	208MS53	208GK54MS	208GD54MS
	4.6mm	208MS5405	208MS5410	208MS5415	208MS54	208GK54MS	208GD54MS
218 MS Polymeric C18							
5µm	1.0mm	218MS5105	218MS5110	218MS5115	218MS51	218GK51MS	218GD51MS
	2.1mm	218MS5205	218MS5210	218MS5215	218MS52	218GK52MS	218GD52MS
	3.2mm	—	—	—	218MS53	218GK54MS	218GD54MS
	4.6mm	218MS5405	218MS5410	218MS5415	218MS54	218GK54MS	218GD54MS
238 MS Monomeric C18							
5µm	1.0mm	238MS5105	238MS5110	238MS5115	238MS51	238GK51MS	—
	2.1mm	238MS5205	238MS5210	238MS5215	238MS52	238GK52MS	238GD52MS
	3.2mm	—	—	—	238MS53	238GK54MS	238GD54MS
	4.6mm	238MS5405	238MS5410	238MS5415	238MS54	238GK54MS	238GD54MS
219 MS Diphenyl							
5µm	2.1mm	—	219MS5210	—	219MS52	219GK52MS	—
	3.2mm	—	—	—	219MS53	219GK54MS	219GD54MS
	4.6mm	219MS5405	219MS5410	219MS5415	219MS54	219GK54MS	219GD54MS

¹A guard kit includes a holder and one guard cartridge; ²Guard cartridge units include two guard cartridges.

Vydac® MS Nano and Capillary Columns

	i.d.	50mm	100mm	150mm	250mm
214 MS C4					
5µm	75µm	214MS5.07505	214MS5.07510	214MS5.07515	214MS5.07525
	150µm	214MS5.1505	214MS5.1510	214MS5.1515	214MS5.1525
	300µm	214MS5.305	214MS5.310	214MS5.315	214MS5.325
	500µm	214MS5.505	214MS5.510	214MS5.515	214MS5.525
208 MS C8					
5µm	75µm	208MS5.07505	208MS5.07510	208MS5.07515	208MS5.07525
	150µm	208MS5.1505	208MS5.1510	208MS5.1515	208MS5.1525
	300µm	208MS5.305	208MS5.310	208MS5.315	208MS5.325
	500µm	208MS5.505	208MS5.510	208MS5.515	208MS5.525
218 MS Polymeric C18					
3µm	75µm	218MS3.07505	218MS3.07510	218MS3.07515	218MS3.07525
	150µm	218MS3.1505	218MS3.1510	218MS3.1515	218MS3.1525
	300µm	218MS3.305	218MS3.310	218MS3.315	218MS3.325
	500µm	218MS3.505	218MS3.510	218MS3.515	218MS3.525
5µm	75µm	218MS5.07505	218MS5.07510	218MS5.07515	218MS5.07525
	150µm	218MS5.1505	218MS5.1510	218MS5.1515	218MS5.1525
	300µm	218MS5.305	218MS5.310	218MS5.315	218MS5.325
	500µm	218MS5.505	218MS5.510	218MS5.515	218MS5.525
238 MS Monomeric C18					
5µm	75µm	238MS5.07505	238MS5.07510	238MS5.07515	238MS5.07525
	150µm	238MS5.1505	238MS5.1510	238MS5.1515	238MS5.1525
	300µm	238MS5.305	238MS5.310	238MS5.315	238MS5.325
	500µm	238MS5.505	238MS5.510	238MS5.515	238MS5.525

Vydac® MS Guard Cartridges

Packing	i.d. x Length	Qty.	Part No.
C18 Polymeric, 5µm*			
Capillary Guard**	1.0 x 10mm	2	218GD51MS
C4, 5µm* Capillary Guard**	0.150 x 10mm	ea	214MS5C0115
	1.0 x 10mm	2	214GD51MS

*All-Guard™ holder required. Other particle sizes available.

**1.5µm and 5µm particles and other dimensions are available.

Vydac® MS Guard Cartridges (continued)

Packing	Qty.	Part No.
<i>Capillary Guard Cartridge Holder</i>		
Guard Holder for 0.100mm and 0.150mm Guards	ea	GR-3710E
Guard Holder for 0.300mm and 0.500mm Guards	ea	GR-3710A
Guard Holder for 1mm Guards	ea	GCH1