

## Product Information

### Lectin-Agarose from *Galanthus nivalis* (snowdrop)

Product Number **L8775**  
Storage Temperature 2–8 °C

#### Product Description

Lectins are proteins or glycoproteins of non-immune origin that agglutinate cells and/or precipitate complex carbohydrates. Lectins are capable of binding glycoproteins even in presence of various detergents.<sup>1</sup> The agglutination activity of these highly specific carbohydrate-binding molecules is usually inhibited by a simple monosaccharide, but for some lectins, di, tri, and even polysaccharides are required.

Lectins are isolated from a wide variety of natural sources, including seeds, plant roots and bark, fungi, bacteria, seaweed and sponges, mollusks, fish eggs, body fluids of invertebrates and lower vertebrates, and from mammalian cell membranes. The precise physiological role of lectins in nature is still unknown, but they have proved to be very valuable in a wide variety of applications *in vitro*, including:

1. blood grouping and erythrocyte polyagglutination studies.
2. mitogenic stimulation of lymphocytes.
3. lymphocyte subpopulation studies.
4. fractionation of cells and other particles.
5. histochemical studies of normal and pathological conditions.

Sigma offers a range of lectins suitable for the above applications. Most Sigma lectins are highly purified by affinity chromatography, but some are offered as purified or partially purified lectins, suitable for specific applications.

Many of the lectins are available conjugated to (conjugation does not alter the specificity of the lectin):

1. fluorochromes (for detection by fluorimetry).
2. enzymes (for enzyme-linked assays).
3. insoluble matrices (for use as affinity media).

Please refer to the table for general information on the most common lectins.

This product is immobilized on crosslinked 4% beaded agarose. This resin has been used for the purification of mouse IgM. When mouse hybridoma serum containing an IgM monoclonal antibody was applied to the column, highly purified IgM antibody was obtained after elution with methyl  $\alpha$ -D-mannoside. Human IgM did not bind this resin.  $\alpha_2$ -macroglobulin was the sole glycoprotein present in human serum which bound to the column.

Only glycoproteins containing multiple man  $\alpha(1\rightarrow3)$  man sugar side-chains will bind to this immobilized lectin. A 0.5 ml aliquot of the glycoprotein solution (2 mg/ml in phosphate buffered saline) or serum was applied to a 0.7 cm  $\times$  15 cm column and incubated for one hour. The column was washed with phosphate buffered saline, and elution was with 0.5 M methyl  $\alpha$ -D-mannoside in phosphate buffered saline (flow rate of 1 ml/hr). Absorbance at 280 nm was measured to monitor protein elution. The column purification was performed at 4 °C.<sup>2</sup>

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

This agarose conjugate is a suspension in 1 M NaCl and 15 mM sodium azide. It should be centrifuged for 30 seconds at  $1,000 \times g$  to pellet the resin. The supernatant should then be discarded and replaced by binding buffer dictated by the experiment.

#### Storage/Stability

Aggregation is thought to occur in the presence of high concentrations of 2-mercaptoethanol.

Lectin	MW (kDa)	Subunits	Specificity		Mitogenic Activity
			Blood Group	Sugar	
<i>Abrus precatorius</i>			—		+
Agglutinin	134	4		gal	
Abrin A (toxin)	60	2		gal	
Abrin B (toxin)	63.8	2( $\alpha\beta$ )		gal	
<i>Agarius bisporus</i>	58.5	—	—	$\beta$ -gal(1 $\rightarrow$ 3)galNAc	
<i>Anguilla anguilla</i>	40	2	H	$\alpha$ -L-Fuc	
<i>Arachis hypogaea</i>	120	4	T	$\beta$ -gal(1 $\rightarrow$ 3)galNAc	
<i>Artocarpus integrifolia</i>	42	4	T	$\alpha$ -gal $\rightarrow$ OMe	+
<i>Bandeiraea simplicifolia</i>					
BS-I	114	4	A, B	$\alpha$ -gal, $\alpha$ -galNAc	
BS-I-A <sub>4</sub>	114	4	A	$\alpha$ -galNAc	
BS-I-B <sub>4</sub>	114	4	B	$\alpha$ -gal	
BS-II	113	4	acq, B, Tk, T	glcNAc	
<i>Bauhinia purpurea</i>	195	4	—	$\beta$ -gal(1 $\rightarrow$ 3)galNAc	+
<i>Caragana arborescens</i>	60; 120 <sup>a</sup>	2/4	—	galNAc	
<i>Cicer arietinum</i>	44	2	—	fetuin	
<i>Codium fragile</i>	60	4	—	galNAc	
Concanavalin A	102	4	—	$\alpha$ -man, $\alpha$ -glc	+
Succinyl-Concanavalin A	51	2	—	$\alpha$ -man, $\alpha$ -glc	+ <sup>b</sup>
<i>Cytisus scoparius</i>	—	—	—	galNAc, gal	
<i>Datura stramonium</i>	86	2( $\alpha\beta$ )	—	(glcNAc) <sub>2</sub>	
<i>Dolichos biflorus</i>	140	4	A <sub>1</sub>	$\alpha$ -galNAc	
<i>Erythrina corallodendron</i>	60	2	—	$\beta$ -gal(1 $\rightarrow$ 4)glcNAc	+
<i>Erythrina cristagalli</i>	56.8	2( $\alpha\beta$ )	—	$\beta$ -gal(1 $\rightarrow$ 4)glcNAc	
<i>Euonymus europaeus</i>	166	4( $\alpha\beta$ )	B, H	$\alpha$ -gal(1 $\rightarrow$ 3)gal	+
<i>Galanthus nivalis</i>	52	4	(h)	non-reduc. $\alpha$ -man	
<i>Glycine max</i>	110	4	—	galNAc	+ <sup>c</sup>
<i>Helix aspersa</i>	79	—	A	galNAc	
<i>Helix pomatia</i>	79	6	A	galNAc	
<i>Lathyrus odoratus</i>	40-43	4( $\alpha\beta$ )	—	$\alpha$ -man	+
<i>Lens culinaris</i>	49	2	—	$\alpha$ -man	+
<i>Limulus polyphemus</i>	400	18	—	NeuNAc	
Bacterial agglutinin	—	—	—	galNAc, glcNAc	
<i>Lycopersicon esculentum</i>	71	—	—	(glcNAc) <sub>3</sub>	
<i>Maackia amurensis</i>	130	2( $\alpha\beta$ )	O	sialic acid	+
<i>Maclura pomifera</i>	40-43	2( $\alpha\beta$ )	—	$\alpha$ -gal, $\alpha$ -galNAc	
<i>Momordica charantia</i>	115-129	4( $\alpha\beta$ )	—	gal, galNAc	
<i>Naja mocambique mocambique</i>	—	—	—	—	
<i>Naja naja kaouthia</i>	—	—	—	—	
<i>Narcissus pseudonarcissus</i>	26	2	(h)	$\alpha$ -D-man	
<i>Perseu americana</i>	—	—	—	—	
<i>Phaseolus coccineus</i>	112	4	—	—	
<i>Phaseolus limensis</i>	247(II)	8	A	galNAc	+
	124(III)	4			
<i>Phaseolus vulgaris</i>					
PHA-E	128	4	—	oligosaccharide	+
PHA-L	128	4	—	oligosaccharide	+
PHA-P					
PHA-M					

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Lectin	MW (kDa)	Subunits	Specificity		Mitogenic Activity
			Blood Group	Sugar	
<i>Phytolacca americana</i>	32	—	—	(glcNAc) <sub>3</sub>	+
<i>Pisum sativum</i>	49	4(αβ)	—	α-man	+
<i>Pseudomonas aeruginosa PA-I</i>	13-13.7	—	—	gal	+ <sup>c</sup>
<i>Psophocarpus tetragonolobus</i>	35	1	—	galNAc, gal	
<i>Ptilota plumosa</i>	65; 170	—	B	α-gal	
<i>Ricinus communis</i>					
Toxin, RCA <sub>60</sub>	60	2	—	galNAc, β-gal	
Toxin, RCA <sub>120</sub>	120	4	—	β-gal	
<i>Sambucus nigra</i>	140	4(αβ)	—	αNeuNAC(2→6)gal	+ <sup>c</sup>
				galNAc	
<i>Solanum tuberosum</i>	50; 100 <sup>a</sup> 1, 2		—	(glcNAc) <sub>3</sub>	
<i>Sophora japonica</i>	133	4	A, B	β-galNAc	
<i>Tetragonolobus purpureas</i>	120(A)	4	H	α-L-fuc	
	58(BA)	2	H	α-L-fuc	
	117(C)	4	H	α-L-fuc	
<i>Triticum vulgaris</i>	36	2	—	(glcNAc) <sub>2</sub> , NeuNAC	+
<i>Ulex europaeus</i>					
UEA I	68	—	H	α-L-fuc	
UEA II	68	—	—	(glcNAc) <sub>2</sub>	
<i>Vicia faba</i>	50	4(αβ)	—	man, glc	+
<i>Vicia sativa</i>	40	4(αβ)	—	glc, man	+
<i>Vicia villosa</i>	139	4	A <sub>1</sub> +T <sub>n</sub>	galNAc	
A <sub>4</sub>	134	4	A <sub>1</sub>	galNAc	
B <sub>4</sub>	143	4	T <sub>n</sub>	galNAc	
<i>Vigna radiata</i>	160	4	—	α-gal	
<i>Viscum album</i>	115	4(αβ)	—	β-gal	
<i>Wisteria floribunda</i>	68	2	—	galNAc	

<sup>a</sup> Concentration-dependent molecular weight

<sup>b</sup> Non-agglutinating and mitogenic

<sup>c</sup> Mitogenic for neuraminidase-treated lymphocytes

## References

1. Nagata, Y., and Burger, M. M., Wheat germ agglutinin. Molecular characteristics and specificity for sugar binding. J. Biol. Chem., **249**, 3116-3122 (1974).
2. Shibuya, N., et al., Arch. Biochem. Biophys., **267**, 676-680, (1988)

SBC,IRB,MWM,JRC,NSB,SAG,MAM 08/18-1