

Product Information

Lectin-Agarose from *Triticum vulgare*

Product Number **L 1394**
Storage Temperature 2-8 °C

Product Description

At low pH (below pH 3), this lectin is a monomer (17 kDa by sedimentation velocity). However, it is a dimer (35 kDa by sedimentation velocity) at neutral to slightly acidic pH.^{1,2} By SDS-PAGE analysis, the monomers migrate as 18 kDa proteins.³

The absorption maximum (λ_{\max}) for the native dimer is 272 nm with a molar extinction coefficient (E^M) of 1.09×10^5 . The pI varies by lectin isoform (isoelectins I, IIa, III - pI = 8.7 +/- 0.3 and isolectin IIb - pI = 7.7 +/- 0.3).⁴

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.⁵ 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.

The inhibition of agglutination activity by di-N-acetylglucosamine (GlcNAc)₂ on this wheat germ lectin is reported to be approximately 600 times greater than that of N-acetylglucosamine (GlcNAc). Tri-N-acetylglucosamine (GlcNAc)₃ is reported to be about 3000 times more inhibitory than GlcNAc.⁶

This product is immobilized on 6% agarose macrobeads. The use of this immobilized lectin in purifying membrane glycoproteins has been published.⁷ This product has also been used to bind the oocyte receptors responsible for mediating the effects of insulin and IGF-1. The solubilized *Xenopus* oocyte receptor was applied to the lectin, and elution was performed with N-acetylglucosamine.⁸

This resin should be regenerated using 0.5 M NaCl containing Mg²⁺, Mn²⁺, Ca²⁺, and Zn²⁺ (1 mM each). The resin should be incubated for 30 minutes, washed with fresh regeneration solution, and then be re-equilibrated with running buffer. If the resin is to be stored, the solution should contain all of the above metal ions plus a bacteriostat.

Precautions and Disclaimer

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

Preparation Instructions

This agarose conjugate is a suspension in 0.9% NaCl and 0.01% thimerosal. It should be centrifuged for 30 seconds at 1,000 x g to pellet. 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	–	–	β -gal(1 \rightarrow 3)galNAc	
<i>Anguilla anguilla</i>	40	2	H	α -L-Fuc	
<i>Arachis hypogaea</i>	120	4	T	β -gal(1 \rightarrow 3)galNAc	
<i>Artocarpus integrifolia</i>	42	4	T	α -gal \rightarrow OMe	+
<i>Bandeiraea simplicifolia</i>					
BS-I	114	4	A, B	α -gal, α -galNAc	
BS-I-A ₄	114	4	A	α -galNAc	
BS-I-B ₄	114	4	B	α -gal	
BS-II	113	4	acq, B, Tk, T	glcNAc	
<i>Bauhinia purpurea</i>	195	4	–	β -gal(1 \rightarrow 3)galNAc	+
<i>Caragana arborescens</i>	60; 120 ^a	2/4	–	galNAc	
<i>Cicer arietinum</i>	44	2	–	fetuin	
<i>Codium fragile</i>	60	4	–	galNAc	
<i>Concanavalin A</i>	102	4	–	α -man, α -glc	+
<i>Succinyl-Concanavalin A</i>	51	2	–	α -man, α -glc	+ ^b
<i>Cytisus scoparius</i>	–	–	–	galNAc, gal	
<i>Datura stramonium</i>	86	2($\alpha\beta$)	–	(glcNAc) ₂	
<i>Dolichos biflorus</i>	140	4	A ₁	α -galNAc	
<i>Erythrina corallodendron</i>	60	2	–	β -gal(1 \rightarrow 4)glcNAc	+
<i>Erythrina cristagalli</i>	56.8	2($\alpha\beta$)	–	β -gal(1 \rightarrow 4)glcNAc	
<i>Euonymus europaeus</i>	166	4($\alpha\beta$)	B, H	α -gal(1 \rightarrow 3)gal	+
<i>Galanthus nivalis</i>	52	4	(h)	non-reduc. α -man	
<i>Glycine max</i>	110	4	–	galNAc	+ ^c
<i>Helix aspersa</i>	79	–	A	galNAc	
<i>Helix pomatia</i>	79	6	A	galNAc	
<i>Lathyrus odoratus</i>	40-43	4($\alpha\beta$)	–	α -man	+
<i>Lens culinaris</i>	49	2	–	α -man	+
<i>Limulus polyphemus</i>	400	18	–	NeuNAc	
Bacterial agglutinin	–	–	–	galNAc, glcNAc	
<i>Lycopersicon esculentum</i>	71	–	–	(glcNAc) ₃	
<i>Maackia amurensis</i>	130	2($\alpha\beta$)	O	sialic acid	+
<i>Maclura pomifera</i>	40-43	2($\alpha\beta$)	–	α -gal, α -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)	α -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) ₃	+
<i>Pisum sativum</i>	49	4(αβ)	–	α-man	+
<i>Pseudomonas aeruginosa PA-I</i>	13-13.7	–	–	gal	+ ^c
<i>Psophocarpus tetragonolobus</i>	35	1	–	galNAc, gal	
<i>Ptilota plumosa</i>	65; 170	–	B	α-gal	
<i>Ricinus communis</i>					
Toxin, RCA ₆₀	60	2	–	galNAc, β-gal	
Toxin, RCA ₁₂₀	120	4	–	β-gal	
<i>Sambucus nigra</i>	140	4(αβ)	–	αNeuNAC(2→6)gal galNAc	+ ^c
<i>Solanum tuberosum</i>	50; 100 ^a 1, 2		–	(glcNAc) ₃	
<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 vulgare</i>	36	2	–	(glcNAc) ₂ , NeuNAc	+
<i>Ulex europaeus</i>					
UEA I	68	–	H	α-L-fuc	
UEA II	68	–	–	(glcNAc) ₂	
<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 ₁ +T _n	galNAc	
A ₄	134	4	A ₁	galNAc	
B ₄	143	4	T _n	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	

^a Concentration-dependent molecular weight

^b Non-agglutinating and mitogenic

^c Mitogenic for neuraminidase-treated lymphocytes

References

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