

Product Information

Lectin

from *Phytolacca americana* (pokeweed)

Product Number **L 9379**

Storage Temperature 2-8 °C

Product Description

Molecular weight: 32 kDa (sedimentation equilibrium)^{1,2}

λ_{max} : 280 nm¹

Extinction coefficient: $E^{1\%} = 18.5$ (280 nm in water)¹

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.³ 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.

Lectin from *Phytolacca americana* (pokeweed mitogen) has specificity for sugar chains containing a di-N-Acetylchitobiose moiety such as is found on "band-3 glycoprotein" from human erythrocytes.⁴

Di-N-acetylchitobiose and tri-N-acetylchitobiose inhibit agglutination activity of the lectin.⁴

This product has been used in mitogenic assays.⁵

Precautions and Disclaimer

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

Preparation Instructions

The product is soluble in 0.9% sodium chloride solution (1 mg/ml), yielding a clear, yellow solution.

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					

----- Table continued on next page -----

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

1. Reisfeld, R. A., et al., Isolation and Characterization of a Mitogen from Pokeweed (*Phytolacca americana*). Proc. Nat. Acad. Sci., **58(5)**, 2020-2027 (1967).
2. Protein Purification Methods: A Practical Approach., Harris, E. L. V., and Angal, S., eds., IRL Press at Oxford University Press (New York, NY: 1989), p. 270.
3. Rueben, L., et al., Activities of lectins and their immobilized derivatives in detergent solutions. Implications on the use of lectin affinity chromatography for the purification of membrane glycoproteins. Biochemistry, **16**, 1787-1794 (1977).
4. Yokoyama, K., et al., Carbohydrate-binding Specificity of Pokeweed Mitogens. Biochim. Biophys. Acta, **538(2)**, 384-396 (1978).
5. Immunology Series No. 8 Procedures Guide, Quantitation and Functional Assay of T and B Cells, U.S. Dept. HEW, PHS, CDC, Bureau of Labs (Atlanta, GA: 1978), pp. 10-20.

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.