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Product Information

Lectin
from *Agaricus bisporus* (mushroom)

Catalog Number **L5640**
Storage Temperature –20 °C

Product Description

Agaricus bisporus agglutinin (ABA) is a mixture of two phytohemagglutinins with similar specificities for carbohydrate receptors (PHA-A and PHA-B).[1] Both PHA-A and PHA-B are heterogeneous by SDS-PAGE. The mushroom PHA will have a molecular weight of 58.5 kDa as determined by gel filtration.

PHA-A and PHA-B agglutinate erythrocytes independent of their blood group type. Trypsin treatment of erythrocytes decreases lectin binding to the cell surface. The O-linked glycopeptide released by trypsin is a potent inhibitor of both the isolectins. Removal of the terminal sialic acid residue from the glycopeptide increases its inhibitory potency 8-fold. Periodate or β-galactosidase treatment of the trypsin released glycopeptide destroys all inhibitory activity. Simple sugars are very poor inhibitors of these isolectins. However, a galactose residue appears to play a major role in these lectin binding mechanisms. The sugar linkage is also important since a synthetic N-linked glycopeptide is not inhibitory, while the O-linked glycopeptide released by trypsinization is a potent inhibitor. The cell receptor for the isolectins has the structure Galactose-Gal-NAc-ser (or threonine).[2]

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:

- blood grouping and erythrocyte polyagglutination studies
- fractionation of cells and other particles
- histochemical studies of normal and pathological conditions.
- mitogenic stimulation of lymphocytes.
- lymphocyte subpopulation studies.

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

Conjugation does not alter the specificity of the lectin. Many of the lectins are available conjugated to:

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

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

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Reagent

Lyophilized powder containing ~10% protein (Biuret).

Preparation Instructions

Soluble in phosphate buffered saline, pH 6.8 (1 mg/ml), yielding a clear to hazy, faint 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	
Abrus precatorius			–		+
Agglutinin	134	4		gal	
Abrin A (toxin)	60	2		gal	
Abrin B (toxin)	63.8	2(αβ)		gal	
Agarius bisporus	58.5	–	–	β-gal(1→3)galNAc	
Anguilla anguilla	40	2	H	α-L-Fuc	
Arachis hypogaea	120	4	T	β-gal(1→3)galNAc	
Artocarpus integrifolia	42	4	T	α-gal→OMe	+
Bandeiraea simplicifolia					
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	
Bauhinia purpurea	195	4	–	β-gal(1→3)galNAc	+
Caragana arborescens	60; 120[a]	2/4	–	galNAc	
Cicer arietinum	44	2	–	fetuin	
Codium fragile	60	4	–	galNAc	
Concanavalin A	102	4	–	α-man, α-glc	+
Succinyl-Concanavalin A	51	2	–	α-man, α-glc	+[b]
Cytisus scoparius	–	–	–	galNAc, gal	
Datura stramonium	86	2(αβ)	–	$(glcNAc)_2$	
Dolichos biflorus	140	4	A_1	α-galNAc	
Erythrina corallodendron	60	2	–	β-gal(1→4)glcNAc	+
Erythrina cristagalli	56.8	2(αβ)	–	β-gal(1→4)glcNAc	
Euonymus europaeus	166	4(αβ)	B, H	α-gal(1→3)gal	+
Galanthus nivalis	52	4	(h)	non-reduc. α-man	
Glycine max	110	4	–	galNAc	+[c]
Helix aspersa	79	–	A	galNAc	
Helix pomatia	79	6	A	galNAc	
Lathyrus odoratus	40-43	4(αβ)	–	α-man	+
Lens culinaris	49	2	–	α-man	+
Limulus polyphemus	400	18	–	NeuNAc	
Bacterial agglutinin	–	–	–	galNAc, glcNAc	
Lycopersicon esculentum	71	–	–	$(glcNAc)_3$	
Maackia amurensis	130	2(αβ)	O	sialic acid	+
Maclura pomifera	40-43	2(αβ)	–	α-gal, α-galNAc	
Momordica charantia	115-129	4(αβ)	–	gal, galNAc	
Naja mocambique mocambique	–	–	–	–	
Naja naja kaouthia	–	–	–	–	
Narcissus pseudonarcissus	26	2	(h)	α-D-man	
Perseau americana	–	–	–	–	
Phaseolus coccineus	112	4	–	–	
Phaseolus limensis	247(II)	8	A	galNAc	+
	124(III)	4			
Phaseolus vulgaris					
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	
Phytolacca americana	32	–	–	$(glcNAc)_3$	+
Pisum sativum	49	4(αβ)	–	α-man	+
Pseudomonas aeruginosa PA-I	13-13.7	–	–	gal	+[c]
Psophocarpus tetragonolobus	35	1	–	galNAc, gal	
Ptilota plumosa	65; 170	–	B	α-gal	
Ricinus communis					
Toxin, RCA_{60}	60	2	–	galNAc, β-gal	
Toxin, RCA_{120}	120	4	–	β-gal	
Sambucus nigra	140	4(αβ)	–	αNeuNAC(2→6)gal galNAc	+[c]
Solanum tuberosum	50; 100[a]	1, 2	–	$(glcNAc)_3$	
Sophora japonica	133	4	A, B	β-galNAc	
Tetragonolobus purpureas	120(A)	4	H	α-L-fuc	
	58(BA)	2	H	α-L-fuc	
	117(C)	4	H	α-L-fuc	
Triticum vulgaris	36	2	–	$(glcNAc)_2$, NeuNAc	+
Ulex europaeus					
UEA I	68	–	H	α-L-fuc	
UEA II	68	–	–	$(glcNAc)_2$	
Vicia faba	50	4(αβ)	–	man, glc	+
Vicia sativa	40	4(αβ)	–	glc, man	+
Vicia villosa	139	4	$A_{1+}T_n$	galNAc	
A_4	134	4	A_1	galNAc	
B_4	143	4	T_n	galNAc	
Vigna radiata	160	4	–	α-gal	
Viscum album	115	4(αβ)	–	β-gal	
Wisteria floribunda	68	2	–	galNAc	

[a] Concentration-dependent molecular weight
[b] Non-agglutinating and mitogenic
[c] Mitogenic for neuraminidase-treated lymphocytes

References

1. Presant, C.A. and Kornfeld, S., *J. Biol. Chem*., **247**, 6937 (1972).
2. Young, N. M., et al., *J. Biol. Chem*., **246**, 1596 (1971).
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).

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