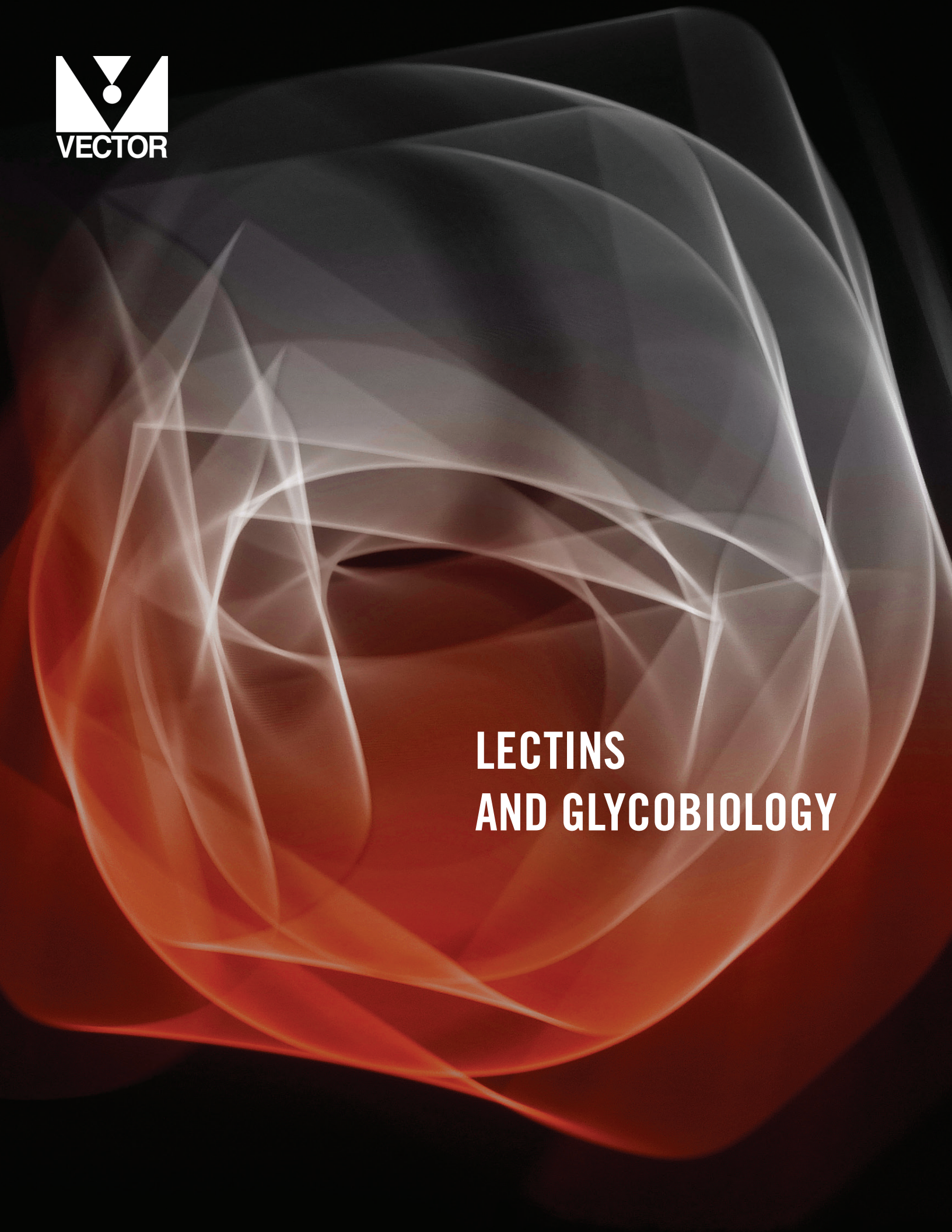
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LECTINS
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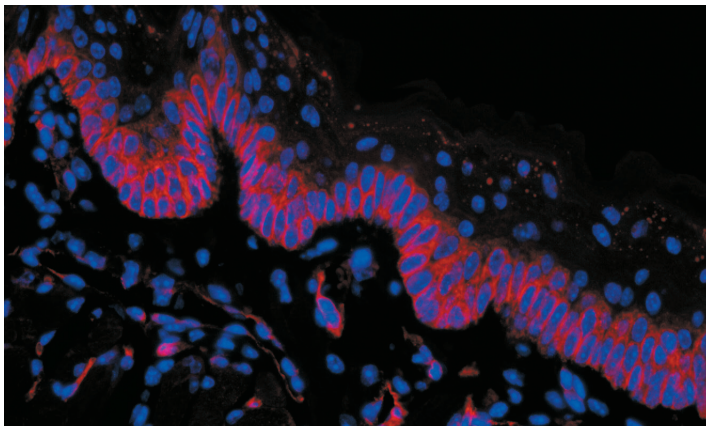
Introduction

Since the 1880's, it has been known that extracts from certain plants could agglutinate red blood cells. In the 1940's, agglutinins were discovered which could "select" types of cells based on their blood group activities. Although "lectin" was originally coined to define agglutinins that could discriminate among types of red blood cells, today the term is used more generally and includes sugar-binding proteins from many sources regardless of their ability to agglutinate cells. Lectins have been found in plants, viruses, microorganisms, and animals but despite their ubiquity, in many cases their biological function is unclear.

Most lectins are multimeric, consisting of non-covalently associated subunits. It is this multimeric structure that gives lectins their ability to agglutinate cells or form precipitates with glycoconjugates in a manner similar to antigen-antibody interactions. This unique group of proteins has provided researchers with powerful tools to explore a myriad of biological structures and processes. Because of the specificity that each lectin has toward a particular carbohydrate structure, even oligosaccharides with identical sugar compositions can be distinguished or separated. The affinity between a lectin and its receptor may vary a great deal due to small changes in the carbohydrate structure of the receptor. These properties enable the researcher to discriminate between structures, isolate a specific glycoconjugate, cell, or virus from a mixture, or study one process among several. Another property of some lectins is an ability to induce mitosis in cells that are normally not dividing. This property has been exploited extensively in an attempt to understand the process of lymphocyte blastogenesis and the biochemical and structural alterations associated with mitogenesis. These important applications include lymphokine production and viral coat protein (eg gp120) isolation. In fact, thousands of articles on lectins have been published examining hundreds of different aspects and uses of lectins.

Lectins have been purified by "conventional" procedures including salt-induced crystallization, ethanol precipitation, ion exchange chromatography and gel filtration, or by affinity chromatography. The former methods rely on the physicochemical properties of the proteins for separation while affinity chromatography depends on the specific interaction between the lectin and a carbohydrate structure attached to an inert matrix. We employ both "conventional" procedures and affinity chromatography for each of our lectins. Purification is monitored and final product is assessed by immunoprecipitation with antisera, agglutination titre, polyacrylamide gel electrophoresis, and binding activity to specific affinity columns, providing the assurance that our customers have the best lectins available.



Mouse Tongue: endothelial cells stained with Dylight® 594-labeled Griffonia simplicifolia Lectin, Isolectin B_4 (red fluorescence). Mounted with VECTASHIELD® Hard•Set™ with DAPI (blue fluorescence).

Table of Lectin Properties

Lectin	Common Abbreviation	Source	Mol. Wt. (kDa)	Number of Subunits	pI	ε 0.1% 280 nm	Glycoprotein	Metal Ions Present
Agaricus bisporus	ABL	*Agaricus bisporus* white button mushrooms	68	4	5-6	1.6	_	No
Aleuria aurantia	AAL	*Aleuria aurantia* mushrooms	72	2	9	2.97	No	--
Amaranthus caudatus	ACL, ACA	*Amaranthus caudatus* seeds	66-70	2	6.7 - 7.7	1.60	No	No
Bauhinia purpurea	BPL, BPA	*Bauhinia purpurea alba* (Camel's Foot Tree) seeds	195	4	4.6 - 6	1.75	Yes	No
Concanavalin A	Con A	*Canavalia ensiformis* (Jack Bean) seeds	104	4	6.3 - 7	1.20	No	Ca^{++}, Mn^{++}
Succinylated Concanavalin A	Succinylated Con A	*Canavalia ensiformis* (Jack Bean) seeds	56	2	< 4.4	1.2	No	Ca^{++}, Mn^{++}
Datura stramonium	DSL	*Datura stramonium* (Thorn Apple, Jimson Weed) seeds	86	1	> 9	0.80	Yes	No
Dolichos biflorus	DBA	*Dolicos biflorus* (Horse Gram) seeds	111	4	4.6 - 5	1.22	Yes	Ca^{++}, Mn^{++}, Mg^{++} Zn^{++}
Erythrina cristagalli	ECL, ECA	*Erythrina cristagalli* (Coral Tree) seeds	54	2	6.3 - 6.5	1.30	Yes	Ca^{++}, Mn^{++}, Zn^{++}
Euonymus europaeus	EEL	*Eunonymus europaeus* (Spindle Tree) seeds	140	4	4.4	2.40	Yes	Ca^{++}, Zn^{++}
Galanthus nivalis	GNL	*Galanthus nivalis* (Snowdrop) bulbs	50	4	3.5 - 4	1.90	No	No
Griffonia (Bandeiraea) simplicifolia I	GSL I, BSL I	*Griffonia (Bandeiraea) simplicifolia* seeds	114	4	5 - 6.5	1.40	Yes	Ca^{++}, Mn^{++}
Griffonia (Bandeiraea) simplicifolia I Isolectin B_4	GSL I - B_4	*Griffonia (Bandeiraea) simplicifolia* seeds	114	4	6 - 6.2	1.4	Yes	Ca^{++}, Mn^{++}
Griffonia (Bandeiraea) simplicifolia II	GSL II, BSL II	*Griffonia (Bandeiraea) simplicifolia* seeds	113	2	5 - 6	1.25	Yes	Ca^{++}, Mn^{++}
Hippeastrum hybrid	HHL, AL	*Hippeastrum* hybrid (Amaryllis) bulbs	50	4	4.7 - 5.1	1.85	No	No
Jacalin	Jacalin	*Artocarpus integrifolia* (Jackfruit) seeds	66	4	7.8	1.50	Yes	No
Lens culinaris	LCA, LcH	*Lens culinaris* (lentil) seeds	50	4	7.6 - 8.4	1.25	No	Ca^{++}, Mn^{++}
Lotus tetragonolobus	LTL	*Lotus tetragonolobus, Tetragonolobus purpurea* (Winged Pea, Asparagus Pea) seeds	107	4	7.3, 7.6, 7.9 & 8.2	1.51	Yes	Ca^{++}, Mn^{++}
Lycopersicon esculentum	LEL, TL	*Lycopersicon esculentum* (tomato) fruit	71	1	>9	0.76	Yes	--
Maackia amurensis I	MAL I, MAL	*Maackia amurensis* seeds	130	2	4.7	1.40	Yes	No
Maackia amurensis II	MAL II, MAH	*Maackia amurensis* seeds	130	2	4.7	1.33	Yes	No
Maclura pomifera	MPL	*Maclura pomifera* (Osage Orange) seeds	44	4	4.8 - 5.3	1.40	No	No
Musa paradisiaca	BanLec	*Musa paradisiaca* (banana fruit)	30	2	7.3	0.8	_	_

Lectin	Mitogenic Activity	Blood Group Specificity	Preferred Sugar Specificity	Inhibitor or Eluting Sugar	Special Application
Agaricus bisporus	No	Non-specific	Gal(β-1,3) GalNAc	Fetuin	Binds sialylated and non-sialylated T antigen
Aleuria aurantia	No	Non-specific	Fucα6GlcNAc	L-Fuc	Tumor cell marker detection
Amaranthus caudatus	Yes	O>B>A (-SA) T antigen	Galβ3GalNAc	desialyzed fetuin	T-antigen probe
Bauhinia purpurea	Yes	A,B,O (-SA)	Galβ3GalNAc	Lactose	Detection of Reed Sternberg cells of Hodgkin's disease; binds N-Antigen of human erythrocytes
Concanavalin A	Yes	Non-specific	αMan, αGlc	MeαMan+ MeαGlc	Polylysine and histone conjugated as vectors to transfer genes to airway epithelial cells; insulin-like activity
Succinylated Concanavalin A	Yes	None	αMan, αGlc	MeαMan+ MeαGlc	Growth inhibitor of 3T3 mouse fibroblasts
Datura stramonium	Yes	A, B, O	$(GlcNAc)_{2-4}$	Chitin hydrolysate	Marker for mouse peritoneal cells
Dolichos biflorus	No	$A_1>>A_2$	αGalNAc	GalNAc	Distinguishes A_1 from A_2 human red blood cells; binds to rat macrophages in lung tissues
Erythrina cristagalli	Yes	A (–SA)	Galβ4GlcNAc	Lactose	Isolation of human natural killer cells
Euonymus europaeus	Yes	O (–SA), B	Galα3Gal	Lactose	Endothelial cell binding
Galanthus nivalis	No	Rabbit	αMan	MeαMan	Detection of HIV and SIV glycoprotein; isolation of mouse IgM; virus isolation
Griffonia (Bandeiraea) simplicifolia I	No	B>>A1	αGal, αGalNAc	Gal/GalNAc	Endothelial cell marker (for mouse)
Griffonia (Bandeiraea) simplicifolia I Isolectin B_4	No	B	αGal	Gal or Raffinose	Non-primate endothelial cell marker; neuronal marker
Griffonia (Bandeiraea) simplicifolia II	No	A (-SA)>>B (-SA)	α or βGlcNAc	Chitin hydrolysate or GlcNAc	Selective staining of Golgi apparatus; marker for uterine blood vessels and certain carcinomas
Hippeastrum hybrid	No	Rabbit	αMan	MeαMan	
Jacalin	Yes	O (+SA), T antigen	Galβ3GalNAc	Gal or Melibiose	Purification of human IgA
Lens culinaris	Yes	Non-specific	αMan, αGlc	MeαMan+ MeαGlc	
Lotus tetragonolobus	No	O<A2	αFuc	L-Fuc	Distinguishes between pathogenic and non-pathogenic trypanosomes
Lycopersicon esculentum	No	Non-specific	$(GlcNAc)_{2-4}$	Chitin hydrolysate	Perfusion studies in mouse (binding to vascular endothelium)
Maackia amurensis I	Yes	Non-specific	Galβ4GlcNAc	Lactose	
Maackia amurensis II	Yes	Non-specific	Neu5Acα3Galβ3GalNAc	Human Glycophorin	
Maclura pomifera	Yes	A, B, O (-SA)	Galβ3GalNAc	Gal	Binding to rat lymphoid cells
Musa paradisiaca	Yes	Rabbit	αMan, αGlc	MeαMan	Binds gp 120 glycoprotein

Sugar Abbreviations:

Fuc	L-Fucose
Gal	D-Galactose
GalNAc	*N*-Acetylgalactosamine
Glc	D-Glucose
GlcNAc	*N*-Acetylglucosamine
Man	Mannose
MeαGlc	α-Methylglucoside
MeαMan	α-Methylmannoside
Neu5Ac	*N*-Acetylneuraminic acid (sialic acid)
SA	Sialic Acid

Table of Lectin Properties (continued)

Lectin	Common Abbreviation	Source	Mol. Wt. (kDa)	Number of Subunits	pI	ε 0.1% 280 nm	Glycoprotein	Metal Ions Present
Narcissus pseudonarcissus	NPL, NPA, DL	*Narcissus pseudonarcissus* (Daffodil) bulbs	59	4	4.2 - 4.6	1.87	No	No
Peanut	PNA	*Arachis hypogaea* peanuts	110	4	5.5 - 6.5	0.89	No	Ca^{++}, Mg^{++}
Phaseolus vulgaris Erythroagglutinin (PHA-E)	PHA-E	*Phaseolus vulgaris* (Red Kidney Bean) seeds	126	4	6 - 8	1.16	Yes	Ca^{++}, Mn^{++}
Phaseolus vulgaris Agglutinin (PHA-E+L)	PHA-E+L	*Phaseolus vulgaris* (Red Kidney Bean) seeds	126	4	5.2 - 6.2	1.16	Yes	Ca^{++}, Mn^{++}
Phaseolus vulgaris Leucoagglutinin (PHA-L)	PHA-L	*Phaseolus vulgaris* (Red Kidney Bean) seeds	126	4	4.2 - 4.8	1.16	Yes	Ca^{++}, Mn^{++}
Pisum sativum	PSA	*Pisum sativum* (Pea) seeds	53	4	6.0 - 6.7	1.20	Trace	Ca^{++}, Mn^{++}
Psophocarpus tetragonolobus I	PTL I, WBA I	*Psophocarpus tetragonolobus* (Winged Bean) seeds	57	2	8.0	0.95	Yes	--
Psophocarpus tetragonolobus II	PTL II, WBA II	*Psophocarpus tetragonolobus* (Winged Bean) seeds	46	2	6.0	1.20	Yes	--
Ricinus communis I	RCA I, RCA_{120}	*Ricinus communis* (Castor Bean) seeds	120	2	7.8	1.17	Yes	No
Ricinus communis II, ricin	RCA II, RCA_{60}, ricin	*Ricinus communis* (Castor Bean) seeds	60	1	7.1	1.17	Yes	No
Ricin A Chain	Ricin A Chain	RCA_{60}	28	1	7.5	0.7	Yes	No
Ricin B Chain	Ricin B Chain	RCA_{60}	32	1	4.5	1.64	Yes	No
Sambucus nigra	SNA, EBL	*Sambucus nigra* (Elderberry) bark	140	4	5.4 - 5.8	1.50	Yes	No
Solanum tuberosum	STL, PL	*Solanum tuberosum*, (potato) tubers	100	2	>9	0.80	Yes	No
Sophora japonica	SJA	*Sophora japonica* (Japanese Pagoda Tree) seeds	133	2	4.9 - 5.6	1.67	Yes	Ca^{++}, Mn^{++}
Soybean	SBA	*Glycine max* (soybean) seeds	120	4	5.8 - 6	1.33	Yes	Ca^{++}, Mn^{++}
Ulex europaeus I	UEA I	*Ulex europaeus* (Furze Gorse) seeds	63	2	4.5 - 5.1	1.30	Yes	Ca^{++}, Mn^{++}, Zn^{++}
Vicia villosa	VVL, VVA	*Vicia villosa* (Hairy Vetch) seeds	144*	4	5.5 - 6.2	0.78	Yes	Ca^{++}, Mn^{++}
Wheat Germ	WGA	*Triticum vulgaris* (wheat germ)	36	2	>9	1.46	No	Ca^{++}
Succinylated Wheat Germ	Succinylated WGA	*Triticum vulgaris* (wheat germ)	36	2	<3	1.46	No	Ca^{++}
Wistera floribunda	WFA, WFL	*Wisteria floribunda* (Japanese Wisteria) seeds	116	4	5.2 - 5.8	0.89	Yes	--

** Literature values reported: 102 kDa - 144 kDa*

Lectin	Mitogenic Activity	Blood Group Specificity	Preferred Sugar Specificity	Inhibitor or Eluting Sugar	Special Application
Narcissus pseudonarcissus	No	Rabbit	αMan	MeαMan	Detection of beginning of apoptosis of human cell lines
Peanut	No	T antigen (M, N)	Galβ3GalNAc	Gal	Detection of relocalization of Tag antigen in large bowel carcinoma
Phaseolus vulgaris Erythroagglutinin (PHA-E)	Yes	A(-SA)	Galβ4GlcNAcβ2Manα6 (GlcNAcβ4) (GlcNAcβ4Manα3) Manβ4	bovine thyroglobulin, acetic acid	Binding to central nervous system cells (HNK-1 antigen)
Phaseolus vulgaris Agglutinin (PHA-E+L)	Yes	A(-SA)	See PHA-E/PHA-L	bovine thyroglobulin, acetic acid	Binding to central nervous system cells (HNK-1 antigen)
Phaseolus vulgaris Leucoagglutinin (PHA-L)	Yes	–	Galβ4GlcNAcβ6(GlcNAc β2Manα3)Manα3	bovine thyroglobulin, acetic acid	Anterograde neuronal tracing; metastatic tumor marker; lymphocyte mitogen for lymphokine production
Pisum sativum	Yes	Non-specific	αMan, αGlc	MeαMan+ MeαGlc	Separation of lymphoblastic leukemia antigen in kidney cells; purification of feline T-lymphocytes from peripheral blood
Psophocarpus tetragonolobus I	No	Rabbit, O(-SA)	GalNAc, Gal	GalNAc	Staining of mouse M-cells; blood vessel staining of A and B blood group individuals
Psophocarpus tetragonolobus II	No	O(-SA)	GalNAc, Gal	GalNAc	Blood vessel staining (human) of blood group O individuals
Ricinus communis I	No	Non-specific	Gal	Gal or Lactose	Labeling of receptors on sprouting rat neurons
Ricinus communis II, ricin	No	Non-specific	Gal, GalNAc	Gal or Lactose	TOXIC - Used in rat neuronal retrograde transport (suicide transport)
Ricin A Chain	No	–	–	–	Produce hybrid toxins
Ricin B Chain	Yes	–	Gal	Gal or Lactose	Used to potentiate antibody ricin A chain conjugates for tumor toxicity
Sambucus nigra	No	Non-specific	Neu5Acα6Gal/GalNAc	Lactose in buffered saline & acetic acid	Used to distinguish sialylated oligosaccharides bound by human A influenza virus
Solanum tuberosum	No	Non-specific	$(GlcNAc)_{2-4}$	Chitin hydrolysate	Staining of prostate cancer cell line; bacterial cell wall binding
Sophora japonica	No	A>B>O(-SA)	βGalNAc	GalNAc	Distinguishes between pathogenic and non pathogenic trypanosomes
Soybean	Yes	A>O>B	α>βGalNAc	GalNAc	Stem cell separation
Ulex europaeus I	No	O>A2	αFuc	L-Fuc	Human endothelial cell marker
Vicia villosa	No	Tn antigen	GalNAc	GalNAc	Staining of neurons on human cerebral cortex, detection of Tn and Cad antigens
Wheat Germ	Yes	A,B,O	GlcNAc	Chitin hydrolysate or GlcNAc with acid or salt	Insulin receptor purification, neuronal tracing; bacterial cell wall binding
Succinylated Wheat Germ	No	A,B,O	GlcNAc	Chitin hydrolysate or GlcNAc with acid or salt	Differential binding to intrahepatic blood vessels
Wistera floribunda	Yes	Non-specific	GalNAc	GalNAc , acetic acid	Serotyping α-hemolytic streptococci

Sugar Abbreviations:

Fuc	L-Fucose
Gal	D-Galactose
GalNAc	*N*-Acetylgalactosamine
Glc	D-Glucose
GlcNAc	*N*-Acetylglucosamine
Man	Mannose
MeαGlc	α-Methylglucoside
MeαMan	α-Methylmannoside
Neu5Ac	*N*-Acetylneuraminic acid (sialic acid)
SA	Sialic Acid

Lectin Products

Agaricus Bisporus Lectin (ABL)

Unconjugated	L-1420	2 mg
Fluorescein	FL-1421	1 mg
Agarose (2 mg lectin/ml gel)	AL-1423	2 ml
Biotin	B-1425	1 mg

Aleuria Aurantia Lectin (AAL)

Unconjugated	L-1390	2 mg
Alkaline Phosphatase	MB-4100	150 µg
Agarose (2 mg lectin/ml gel)	AL-1393	2 ml
Biotin	B-1395	1 mg

Amaranthus Caudatus Lectin (ACL, ACA)

Unconjugated	L-1250	5 mg
Fluorescein	FL-1251	2 mg
Biotin	B-1255	2 mg

Bauhinia Purpurea Lectin (BPL)

Unconjugated	L-1280	5 mg
Fluorescein	FL-1281	2 mg
Biotin	B-1285	2 mg

Concanavalin A (Con A)

Unconjugated	L-1000	500 mg
Fluorescein	FL-1001	25 mg
Rhodamine	RL-1002	25 mg
Agarose (6 mg lectin/ml gel)	AL-1003	10 ml, 100 ml
Biotin	B-1005	5 mg

Succinylated Concanavalin A

Unconjugated	L-1000S	25 mg
Fluorescein	FL-1001S	10 mg
Agarose (6 mg lectin/ml gel)	AL-1003S	2 ml
Biotin	B-1005S	5 mg

Datura Stramonium Lectin

Unconjugated	L-1180	5 mg
Fluorescein	FL-1181	2 mg
Agarose (3 mg lectin/ml gel)	AL-1183	2 ml
Biotin	B-1185	2 mg

Dolichos Biflorus Agglutinin (DBA)

Unconjugated	L-1030	5 mg, 10 mg
Fluorescein	FL-1031	2 mg, 5 mg
Rhodamine	RL-1032	2 mg
Agarose (3 mg lectin/ml gel)	AL-1033	2 ml
Biotin	B-1035	5 mg

Erythrina Cristagalli Lectin (ECL, ECA)

Unconjugated	L-1140	10 mg
Fluorescein	FL-1141	5 mg
Agarose (3 mg lectin/ml gel)	AL-1143	2 ml
Biotin	B-1145	5 mg

Euonymus Europaeus Lectin (EEL)

Unconjugated	L-1330	5 mg
Fluorescein	FL-1331	2 mg
Biotin	B-1335	2 mg

Galanthus Nivalis Lectin (GNL)

Unconjugated	L-1240	5 mg
Fluorescein	FL-1241	2 mg
Agarose (3 mg lectin/ml gel)	AL-1243	2 ml, 5 ml
Biotin	B-1245	2 mg

Griffonia (Bandeiraea) Simplicifolia Lectin I (GSL I, BSL I)

Unconjugated	L-1100	5 mg
Fluorescein	FL-1101	2 mg, 5 mg
Rhodamine	RL-1102	2 mg
Agarose (4 mg lectin/ml gel)	AL-1103	2 ml
Biotin	B-1105	2 mg

GSL I – isolectin B_4

Unconjugated	L-1104	1 mg
Fluorescein	FL-1201	0.5 mg
DyLight® 594	DL-1207	0.5 mg
Biotin	B-1205	0.5 mg

Griffonia (Bandeiraea) Simplicifolia Lectin II (GSL II, BSL II)

Unconjugated	L-1210	5 mg
Fluorescein	FL-1211	2 mg
Agarose (3 mg lectin/ml gel)	AL-1213	2 ml
Biotin	B-1215	2 mg

Hippeastrum Hybrid (Amaryllis) Lectin (HHL, AL)

Unconjugated	L-1380	5 mg
Biotin	B-1385	2 mg

Jacalin

Unconjugated	L-1150	10 mg, 25 mg
Fluorescein	FL-1151	5 mg
Agarose (4 mg lectin/ml gel)	AL-1153	2 ml, 5 ml, 10 ml
Biotin	B-1155	5 mg

Lens Culinaris Agglutinin (LCA, LcH)

Unconjugated	L-1040	10 mg, 25 mg
Fluorescein	FL-1041	5 mg
Rhodamine	RL-1042	5 mg
Agarose (3 mg lectin/ml gel)	AL-1043	2 ml, 5 ml, 10 ml
Biotin	B-1045	5 mg

Lotus Tetragonolobus Lectin (LTL)

Unconjugated	L-1320	5 mg
Fluorescein	FL-1321	2 mg
Agarose (3 mg lectin/ml gel)	AL-1323	2 ml
Biotin	B-1325	2 mg

Lycopersicon Esculentum (Tomato) Lectin (LEL, TL)

Unconjugated	L-1170	2 mg
Fluorescein	FL-1171	1 mg
Texas Red®	TL-1176	1 mg
DyLight® 488	DL-1174	1 mg
DyLight® 594	DL-1177	1 mg
DyLight® 649	DL-1178	1 mg
Agarose (2 mg lectin/ml gel)	AL-1173	2 ml
Biotin	B-1175	1 mg

Maackia Amurensis Lectin I (MAL I, MAL)

Unconjugated	L-1310	5 mg
Fluorescein	FL-1311	2 mg
Biotin	B-1315	2 mg

Maackia Amurensis Lectin II (MAL II, MAH)

Unconjugated	L-1260	2 mg
Biotin	B-1265	1 mg

Maclura Pomifera Lectin (MPL)

Unconjugated	L-1340	5 mg
Fluorescein	FL-1341	2 mg
Biotin	B-1345	2 mg

Musa Paradisiaca Lectin (BanLec)

Unconjugated	L-1410	5 mg
Fluorescein	FL-1411	2 mg
Agarose (5 mg lectin/ml gel)	AL-1413	2 ml
Biotin	B-1415	2 mg

Narcissus Pseudonarcissus (Daffodil) Lectin (NPL, NPA, DL)

Unconjugated	L-1370	5 mg
Biotin	B-1375	2 mg

Peanut Agglutinin (PNA)

Unconjugated	L-1070	5 mg, 10 mg, 25 mg
Fluorescein	FL-1071	5 mg, 10 mg
Rhodamine	RL-1072	5 mg
Agarose (5 mg lectin/ml gel)	AL-1073	2 ml, 5 ml
Biotin	B-1075	5 mg

Phaseolus Vulgaris Agglutinin (PHA)

Phaseolus vulgaris Erythroagglutinin (PHA-E)

Unconjugated	L-1120	5 mg
Fluorescein	FL-1121	2 mg
Agarose (3 mg lectin/ml gel)	AL-1123	2 ml
Biotin	B-1125	2 mg

Phaseolus vulgaris Agglutinin (PHA-E+L)

Unconjugated	L-1220	25 mg

Phaseolus vulgaris Leucoagglutinin (PHA-L)

Unconjugated	L-1110	5 mg
Fluorescein	FL-1111	2 mg
Rhodamine	RL-1112	2 mg
Agarose (3 mg lectin/ml gel)	AL-1113	2 ml
Biotin	B-1115	2 mg

Pisum Sativum Agglutinin (PSA)

Unconjugated	L-1050	10 mg
Fluorescein	FL-1051	5 mg
Rhodamine	RL-1052	5 mg
Agarose (3 mg lectin/ml gel)	AL-1053	2 ml
Biotin	B-1055	5 mg

Psophocarpus Tetragonolobus Lectin I (PTL I, WBA I)

Unconjugated	L-1360	5 mg
Biotin	B-1365	2 mg

Psophocarpus Tetragonolobus Lectin II (PTL II, WBA II)

Unconjugated	L-1400	5 mg
Biotin	B-1405	2 mg

Ricinus Communis Agglutinin I (RCA I, RCA_{120})

Unconjugated	L-1080	10 mg
Fluorescein	FL-1081	5 mg
DyLight® 594	DL-1087	1 mg
Rhodamine	RL-1082	5 mg
Agarose (4 mg lectin/ml gel)	AL-1083	2 ml, 5 ml, 10 ml
Biotin	B-1085	5 mg

Ricinus Communis Agglutinin II (RCA II, RCA_{60} , ricin)

Unconjugated	L-1090	10 mg
Fluorescein	FL-1091	5 mg
Agarose (4 mg lectin/ml gel)	AL-1093	2 ml
Biotin	B-1095	5 mg

Ricin A Chain

Unconjugated	L-1190	1 mg

Ricin B Chain

Unconjugated	L-1290	1 mg

Sambucus Nigra Lectin (SNA, EBL)

Unconjugated	L-1300	5 mg
Fluorescein	FL-1301	2 mg
Agarose (3 mg lectin/ml gel)	AL-1303	2 ml
Biotin	B-1305	2 mg

Solanum Tuberosum (Potato) Lectin (STL, PL)

Unconjugated	L-1160	5 mg
Fluorescein	FL-1161	2 mg
Biotin	B-1165	2 mg

Sophora Japonica Agglutinin (SJA)

Unconjugated	L-1130	5 mg
Biotin	B-1135	2 mg

Soybean Agglutinin (SBA)

Unconjugated	L-1010	10 mg, 25 mg
Fluorescein	FL-1011	2 mg
Rhodamine	RL-1012	2 mg
Agarose (4 mg lectin/ml gel)	AL-1013	2 ml
Biotin	B-1015	5 mg

Ulex Europaeus Agglutinin I (UEA I)

Unconjugated	L-1060	2 mg, 5 mg
Fluorescein	FL-1061	2 mg, 5 mg
Rhodamine	RL-1062	2 mg
Agarose (2 mg lectin/ml gel)	AL-1063	2 ml
Biotin	B-1065	2 mg

Vicia Villosa Lectin (VVL, VVA)

Unconjugated	L-1230	5 mg
Fluorescein	FL-1231	2 mg
Agarose (3 mg lectin/ml gel)	AL-1233	2 ml
Biotin	B-1235	2 mg

Wheat Germ Agglutinin (WGA)

Unconjugated	L-1020	10 mg, 25 mg
Fluorescein	FL-1021	5 mg, 10 mg
Rhodamine	RL-1022	5 mg, 10 mg
Peroxidase	PL-1026	2 mg
Agarose (7 mg lectin/ml gel)	AL-1023	2 ml, 5 ml, 10 ml
Biotin	B-1025	5 mg

Succinylated Wheat Germ Agglutinin

Unconjugated	L-1020S	10 mg
Fluorescein	FL-1021S	5 mg
Rhodamine	RL-1022S	5 mg
Agarose (3 mg lectin/ml gel)	AL-1023S	2 ml, 5 ml
Biotin	B-1025S	5 mg

Wisteria Floribunda Lectin (WFA, WFL)

Unconjugated	L-1350	5 mg
Fluorescein	FL-1351	2 mg
Agarose (3 mg lectin/ml gel)	AL-1353	2 ml
Biotin	B-1355	2 mg

Lectin Screening Kits

Lectin Screening Kits I

Unconjugated Lectin Kit I	LK-2000	1 kit
Biotinylated Lectin Kit I	BK-1000	1 kit
Fluorescein Lectin Kit I	FLK-2100	1 kit
Rhodamine Lectin Kit I	RLK-2200	1 kit

Lectin Screening Kits II

Lectin Kit II	LK-3000	1 kit
Biotinylated Lectin Kit II	BK-2000	1 kit
Fluorescein Lectin Kit II	FLK-3100	1 kit
Rhodamine Lectin Kit II	RLK-3200	1 kit

Lectin Screening Kits III

Biotinylated Lectin Kit III	BK-3000	1 kit
Fluorescein Lectin Kit III	FLK-4100	1 kit

Kit I (LK-2000, BK-1000, FLK-2100, RLK-2200) consists of 1 mg of the following lectins or lectin conjugates: Con A, DBA, PNA, RCA I, SBA, UEA I, WGA.

Kit II (LK-3000, BK-2000, FLK-3100, RLK-3200) consists of 1 mg of the following lectins or lectin conjugates: GSL I, LCA, PHA-E, PHA-L, PSA, Succinylated WGA, SJA*.

**SJA is not included in FLK-3100*

Kit III (BK-3000, FLK-4100) consists of 0.5 mg of the following lectin conjugates: DSL, ECL, GSL II, Jacalin, LEL, STL, VVL.

Inhibiting Sugars

Product	Catalog Number	Unit Size	Stock Concentration*
Chitin Hydrolysate	SP-0090	10 ml	N.A.
Sugars			
N-acetylgalactosamine	S-9001	111 mg	100 mM
N-acetylglucosamine	S-9002	442 mg	400 mM
galactose	S-9003	360 mg	400 mM
lactose	S-9004	721 mg	400 mM
α-methylmannoside	S-9005	388 mg	400 mM
α-methylglucoside	S-9006	388 mg	400 mM
L-fucose	S-9007	82 mg	100 mM
N-acetylneuraminic acid (sialic acid)	S-9008	619 mg	400 mM

** Stock concentration if reconstituted in 5 ml.*

Antibodies to Lectins

Product	Conjugate	Catalog Number	Unit Size
Anti-Concanavalin A	Unconjugated	AS-2004	1 mg
Anti-*Dolichos biflorus* agglutinin	Unconjugated	AS-2034	1 mg
Anti-*Galanthus nivalis* lectin	Unconjugated	AS-2240	1 mg
Anti-*Griffonia (Bandeiraea) simplicifolia* lectin I	Unconjugated	AS-2104	1 mg
Anti-*Lens culinaris* agglutinin/*Pisum sativum* agglutinin	Unconjugated	AS-2044	1 mg
Anti-Peanut agglutinin	Unconjugated	AS-2074	1 mg
	Biotinylated	BA-0074	0.5 mg
Anti-*Phaseolus vulgaris* agglutinin (E+L)	Unconjugated	AS-2224	1 mg
	Biotinylated	BA-0224	0.5 mg
Anti-*Phaseolus vulgaris* agglutinin (E+L)*	Unconjugated	AS-2300	1 mg
Anti-*Ricinus communis* agglutinin I & II	Unconjugated	AS-2084	1 mg
	Biotinylated	BA-0084	0.5 mg
Anti-Soybean agglutinin	Unconjugated	AS-2014	1 mg
Anti-*Ulex europaeus* agglutinin I	Unconjugated	AS-2064	1 mg
	Biotinylated	BA-0064	0.5 mg
Anti-Wheat Germ agglutinin	Unconjugated	AS-2024	1 mg
	Biotinylated	BA-0024	0.5 mg

Glycobiology Reagents

Neoglycoprotein

BSA-Mannose	G-1000	10 mg
BSA-Galactose	G-2000	10 mg
BSA-Fucose	G-3000	10 mg
BSA-GalNAc	G-4000	10 mg
BSA-Chitin	G-5000	10 mg
BSA-GlcNAc	G-6000	10 mg
BSA-Sialic Acid	G-7000	10 mg
BSA-Arabinose	G-8000	10 mg
BSA-Glucose	G-9000	10 mg

Neoglycoproteins generally describe proteins that, in their native form, do not contain carbohydrate groups but have been chemically derivatized with sugars.

Nine neoglycoproteins are available, each with a unique sugar attached to the protein. They are produced by coupling simple sugars to highly purified Bovine Serum Albumin (BSA). These glycoconjugates retain free amino groups, allowing them to be subsequently labeled with fluorochromes, biotin, or other tags. They can be used: 1) to check the binding activity of agarose lectin columns; 2) as a positive control for glycoprotein blots; 3) to localize endogenous lectins in tissues and cells. Each is supplied as a 10 mg/ml solution.

Agarose-Bound Lectins	Sugars Conjugated to Bovine Serum Albumin								
	Mannose (G-1000)	**Galactose** (G-2000)	**Fucose** (G-3000)	**GalNAc** (G-4000)	**[GlcNAc]1-3** (G-5000)*	**GlcNAc** (G-6000)	**Sialic Acid** (G-7000)	**Arabinose** (G-8000)	**Glucose** (G-9000)
ABL (AL-1423)				+					
AAL (AL-1393)			+					+	
BanLec (AL-1413)	+								+
Con A (AL-1003)	+								+
sCon A (AL-1003S)	+								+
DSL (AL-1183)					+				
DBA (AL-1033)				+					
ECA (AL-1143)				+					
GNA (AL-1243)	+								
GSL I (AL-1103)		+							
GSL II (AL-1213)						+			
Jacalin (AL-1153)		+							
LCA (AL-1043)	+								+
LTL (AL-1323)			+					+	
LEL (AL-1173)					+				
PNA (AL-1073)		+							
PHA-E (AL-1123)		+							
PHA-L (AL-1113)		+							
PSA (AL-1053)	+								+
RCA120 (AL-1083)		+							
RCA60 (AL-1093)		+							
SNA (AL-1303)							+		
SBA (AL-1013)				+					
UEA I (AL-1063)			+					+	
VVA (AL-1233)				+					
WGA (AL-1023)						+			
sWGA (AL-1023S)						+			
WFL (AL-1353)				+					

+ Indicates binding to lectin.

* $[GlcNAc]_{1-3}$ is predominant sugar mixture in chitin hydrolysate.

Glycoprotein Eluting Solution for Agarose Bound:

Mannose- or Glucose-binding Lectins	ES-1100	100 ml
Galactose- or GalNAc-binding Lectins	ES-2100	100 ml
Fucose- or Arabinose-binding Lectins	ES-3100	100 ml
GlcNAc- or Chitin-binding Lectins	ES-5100	100 ml
Sialic Acid-binding Lectins	ES-7100	100 ml

Glycoproteins are frequently isolated and purified from protein mixtures using columns of agarose-bound lectins. After applying a protein mixture, the agarose-lectin column is washed free of unwanted proteins and the glycoprotein bound to the lectin is eluted with a sugar that inhibits binding. Unfortunately, achieving complete elution with a simple sugar solution can be difficult. Vector Laboratories has developed five Glycoprotein Elution Solutions in the neutral pH range that maximize the yield of eluted glycoproteins and preserve the activity of the agarose-bound lectins for repeated use. All components of these ready-to-use Glycoprotein Eluting Solutions can subsequently be removed by dialysis.

Agarose-Bound Lectins	Glycoprotein Eluting Solutions				
	ES-1100	ES-2100	ES-3100	ES-5100	ES-7100
ABL (AL-1423) *					
AAL (AL-1393)			+		
BanLec (AL-1413)	+				
Con A (AL-1003)	+				
sCon A (AL-1003S)	+				
DSL (AL-1183)				+	
DBA (AL-1033)		+			
ECA (AL-1143)		+			
GNA (AL-1243)	+				
GSL I (AL-1103)		+			
GSL II (AL-1213)				+	
Jacalin (AL-1153)		+			
LCA (AL-1043)	+				
LTL (AL-1323)			+		
LEL (AL-1173)				+	
PNA (AL-1073)		+			
PHA-E (AL-1123)		+			
PHA-L (AL-1113)		+			
PSA (AL-1053)	+				
RCA$_{120}$ (AL-1083)		+			
RCA$_{60}$ (AL-1093)		+			
SNA (AL-1303)					+
SBA (AL-1013)		+			
UEA I (AL-1063)			+		
VVA (AL-1233)		+			
WGA (AL-1023)				+	
sWGA (AL-1023S)				+	
WFL (AL-1353)		+			

+ Indicates recommendation for eluting glycoproteins from agarose-bound lectins.

* Requires more stringent conditions for elution.

Notes:

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