Table of Lectin Properties

Lectin	Common Abbreviation	Source	Mol. Wt. (kDa)	Number of Subunits	pI	ε 0.1% 280 nm	Glycoprotein	Metal Ions Present
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
Narcissus pseudonarcissus	NPL, NPA, DL	*Narcissus pseudonarcissus* (Daffodil) bulbs	59	4	4.2 - 4.6	1.87	No	No

Lectin	Mitogenic Activity	Blood Group Specificity	Preferred Sugar Specificity	Inhibitor or Eluting Sugar	Special Application
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	Neu5Acα3Galβ4GalNAc	Human Glycophorin	
Maclura pomifera	Yes	A, B, O (-SA)	Galβ3GalNAc	Gal	Binding to rat lymphoid cells
Narcissus pseudonarcissus	No	Rabbit	αMan	MeαMan	Detection of beginning of apoptosis of human cell lines

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
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
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