Animal Lectins: Focus on Carbohydrate Binding

Lectins (from Latin Lectus, past participle of *legere*, **to select**) are carbohydrate-binding (**selecting**) proteins that show no enzyme activity towards sugars and are present in all life kingdoms. There are at least 13 groups (or families) of lectins in the animal kingdom, some with overlapping carbohydrate specificity. Among these are galectins, pentraxins, I- and P-type lectins, and C-type (Ca^{2+}-dependent) lectins. Also known as the C-type lectin domain (CTLD) superfamily, the C-type lectins include lecticans, type II transmembrane lectins, collectins, selectins, NK/lymphocyte receptors, and the macrophage mannose receptor. The table includes a selected list of research tools for animal lectins available from R&D Systems with the known (or proposed) carbohydrate specificities indicated. These reagents will be useful in defining the ligand specificities and additional functions of these lectins. *For these and other glycobiology research tools, please visit the R&D Systems website, www.RnDSystems.com.*

Selected Lectin Products

MOLECULE	ANTIBODIES	PROTEINS	ELISAs	CARBOHYDRATE SPECIFICITY
Aggrecan	H	H		Galactose/Fucose
ASGR1	M	M		Galactose/GalNAc
Calreticulin-2	H			Glucose
CD44	H	H		Hyaluronan
CD48/SLAMF2	M	H M		Heparan Sulfate
CD83	H M	H M		Sialic Acid
CD94	H			sLeX
CL-P1/COLEC12	H M	H M		GalNAc
CLECSF13	M			Galactose/Fucose
DC-SIGN	H	H		Tri-Mannose/Fucose
DC-SIGNR/CD299	H	H		Tri-Mannose
Dectin-1/CLEC7A	H M	H		$(\beta 1,3\ Glucose)_n$
Dectin-2/CLEC6A	H M	M		Mannose
Fcε RII/CD23	H	H	H	Galactose
FGF basic	H B	H M R B	H	Heparan Sulfate
FGF-7	H Ca	H Ca	H	Heparan Sulfate
Ficolin-2	H	H		GlcNAc
Ficolin-3	H			GlcNAc/GalNAc/Glucose
Galectin-3 BP	H			Galactose/Lactose
Galectins	H M	H M	H M	Galactose/Lactose
ICAM-1/CD54	H M R	H M R	H M R	Hyaluronan
IGF-II R	H	H		Mannose
Langerin	H			Mannose/GlcNAc/Fucose
Layilin	H M	H M		Hyaluronan
LSECtin/CLEC4G	H			Mannose/GlcNAc/Fucose
LYVE-1	H M	H M	H	Hyaluronan

Selected Lectin Products

MOLECULE	ANTIBODIES	PROTEINS	ELISAs	CARBOHYDRATE SPECIFICITY
MAG/Siglec-4a	R	R		α2,3 Sialic Acid
MBL	H M	H M		GcNAc/Mannose/Fucose
MBL-2	M	M		GlcNAc/Mannose
MGL2	M	M		GalNAc
MMR	H M	H M		Mannose/Fucose/GlcNAc
NCAM/CD56	H	H		Heparan Sulfate/ Chondroitin Sulfate
NCAM-L1	H	H		α2,3 Sialic Acid
NKG2D	H M	H M		sLeX
OCIL/CLEC2d	H M			Sulfated Glycosaminoglycan
Pentraxin-3/TSG-14	H M	H M	M	Mannan
Reg 2/PAP	R			Mannan
E-Selectin	H M R	H M R	H M	α2,3 Sialylated, Fucosylated Lactosamine
L-Selectin	H M R	H M R	H M R	α2,6 Sialic Acid
P-Selectin	H M	H M	H M	α2,6 Sialic Acid
Serpin A5	H M	H		Heparan Sulfate
Serpin C1	H M	H M		Heparan Sulfate
Siglec-2, 3, 5, 7, 9, 10, 11	H M	H M	H	α2,3,6,8 Sialic Acid
Siglec-6	H	H		Sialic Acid/GlcNAc
Siglec-F	M	M		6-Sulfo-sLeX
SIGNR1/CD209	M	M		Mannan
SP-D	H			Maltose/Glucose/Mannose
TSG-6	H M			Chondroitin Sulfate/ Hyaluronan
Versican	H			Hyaluronan

Key: B Bovine Ca Canine H Human M Mouse R Rat

U937 Cell Adhesion to P-Selectin

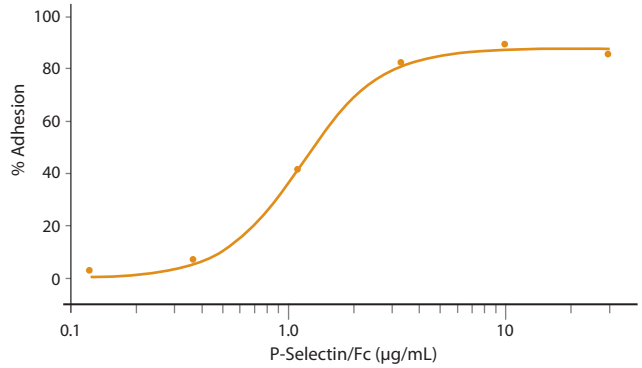

Figure 1. Microplate wells were coated with R&D Systems recombinant human P-selectin/Fc (Catalog # 137-PS) at the indicated concentrations. Recombinant P-selectin stimulates dose-dependent adhesion of the human histiocytic lymphoma cell line U937.

Galectin-3 in Embryonic Mouse Rib

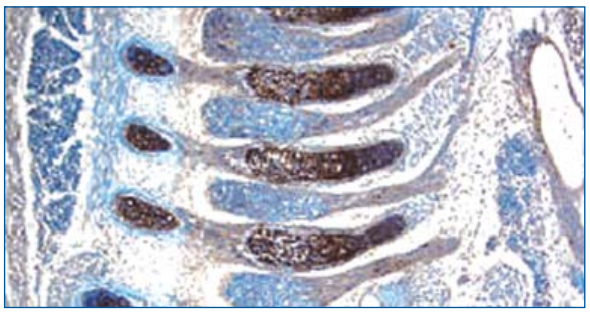

Figure 2. Galectin-3 was detected in a cryostat tissue section of embryonic mouse ribs (15 d.p.c.) using R&D Systems goat anti-mouse affinity purified galectin-3 antibody (Catalog # AF1197). Tissues were stained using R&D Systems anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).