GlycoSeLect

Recombinant Prokaryotic Lectins from GlycoSeLect

High glycan specificity improves glycoprotein analysis and separation

Recombinant prokaryotic lectins (RPLs) offer several advantages over traditional plant-based lectins, making them valuable tools for analysing and purifying glycosylated biomolecules. Being able to perform these types of studies is important to understand how glycosylation influences protein structure and function and to identify any variations in glycosylation profile between different batches of the same protein.

What are Recombinant Prokaryotic Lectins?

Lectins are a class of proteins that bind glycans, the chain-like structures of single sugar molecules (monosaccharides) produced by almost all living organisms. They have traditionally been purified from plants; however, recombinant production offers several advantages. Critically, prokaryotic lectins can be recombinantly expressed as soluble proteins by E. coli, which simplifies production, boosts yields, and provides opportunities for further genetic manipulation.

Advantages of RPLs

- **Superior specificity** – each RPL is tailored to a particular glycan epitope, providing more accurate results compared to using plant lectins (which typically bind a variety of glycans)
- **Enhanced glycan binding** – targeted mutagenesis allows binding properties to be further improved
- **Consistent batch-to-batch performance** – greater experimental reproducibility
- **Simple, scalable production** – manufactured via bacterial culture
- **Can be engineered to express tags** – supports direct detection with anti-tag antibodies

How are RPLs used?

Applications of RPLs span basic research through to biotherapeutic manufacturing.

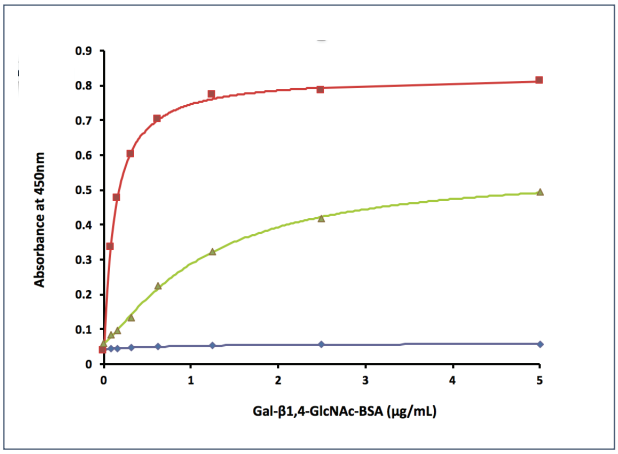
• Glycoanalysis

Traditional HPLC and MS-based methods for analysing glycosylation are complex, time consuming, and expensive. Immobilising RPLs on biosensors (e.g., those used for Biolayer Interferometry) enables in situ, label-free glycoanalysis in real time and can improve workflow efficiencies by increasing throughput.

• Glycopurification

Chromatographic methods for purifying glycoproteins involve laborious, target-dependent development and do not always demonstrate reliable performance. RPLs can be bound to various solid support matrices and used for highly reproducible glycopurification, where their stable structure allows for reuse multiple times.

Product Name	Product Code	Glycan Specificity	Pack Size	Product Concentration	Molecular Wt
RPL-αGal	L-001-2mg	Terminal α-linked Galactose & N-Acetylgalactosamine (GalNAc)	1ml	2mg/ml	14,161 Da
RPL-Gal1	L-002-2mg	Terminal β-linked Galactose & N-Acetyllactosamine (LacNAc)	1ml	2mg/ml	14,066 Da
RPL-Gal2	L-003-2mg	Terminal α-linked Galactose > N-Acetylgalactosamine (GalNAc)	1ml	2mg/ml	14,162 Da
RPL-Gal3	L-004-2mg	Terminal α-linked Galactose	1ml	2mg/ml	14,081 Da
RPL-Gal4	L-005-2mg	Terminal β-linked Galactose, N-Acetyllactosamine (LacNAc) & Lewis x (Lex)	1ml	2mg/ml	14,595 Da
RPL-αMan	L-006-2mg	Fucose/Mannose: Lewis a (Lea), Lewis x (Lex) & terminal α-mannose	1ml	2mg/ml	13,130 Da
RPL-Man2	L-007-2mg	Terminal α -mannose	1ml	2mg/ml	15,163 Da
RPL-Sia1	L-008-2mg	Terminal α2-3-linked Sialic Acid (Neu5Ac) – on both N-linked and O-Linked Glycans	1ml	2mg/ml	27,407 Da
RPL-Sia2	L-009-2mg	Terminal α2-3-linked Sialic Acid (Neu5Ac) on O-Linked Glycans	1ml	2mg/ml	40,725 Da
RPL-Sia3	L-010-2mg	Terminal α-linked Neu5Ac	1ml	2mg/ml	19,585 Da
RPL-Fuc1	L-011-2mg	α-linked Fucose	1ml	2mg/ml	35,849 Da



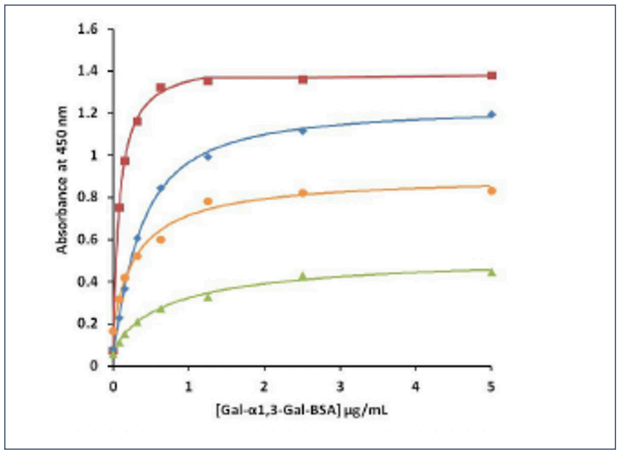
Ability to bind to proteins:

RPLs

Plant lectins

Reference

Comparison of protein binding by an RPL and a plant lectin.



Lectin	Concentration Used		KD
	µg/ml	µM	nM
RPL-αGal	2	0.07	5.2
RPL-Gal2	2	0.07	1.0
RPL-Gal3	2	0.07	4.7
GSL-IB4	8	0.07	11.0

Improved detection of Galα1-3Gal-BSA through targeted mutagenesis of RPL-αGal to produce RPL-Gal2 and RPL-Gal3. (GSL-IB4 is a well-known plant-based lectin).