PLANT CELL WALL
MONOCLONAL ANTIBODIES

>50 rat antibody hybridoma cell lines

Prof. Paul Knox, emeritus professor
University of Leeds, UK
email: *j.p.knox@leeds.ac.uk* **www.plantcellwalls.leeds.ac.uk**

Notes on the selection and use of our MAbs

The LM- and other series of monoclonal antibodies (MAbs) developed in Leeds is a large resource of probes for the analysis of plant cell wall carbohydrates. If you require a specific antibody/epitope then that can be straightforward. If you wish to study and explore wider aspects of cell walls using a panel of antibodies that can detect a range of glycans then we have series of **recommended MAbs** for polysaccharide classes.

For pectic HG we recommend the combined use of **LM19** (unesterified HG) and **LM20** for high methylester HG. **JIM7** is also always additionally recommended for any analysis as it binds widely to pectin.

For detection of xyloglucan we recommend the high affinity **LM25** and for heteromannan **LM21**.

There is a range of probes for heteroxylan – the core two to use would be **LM11** that binds to 1,4-xylosyl residues and **LM28** to glucuronosyl residues. The often different binding patterns of **LM10** and **LM11** is now known to arise from the specific recognition by **LM10** of the non-reducing end (NRE) of xylans.

It can be hard to predict which AGP MAb to select as these glycan epitopes vary between tissues, organs and species. **JIM13** and **LM2** are a good place to start as they usually detect something in a section or an extract. Do not forget that a single AGP glycan epitope is unlikely to detect all AGPs in an organ. For starting with extensins we suggest the use of **LM1** and **JIM20**.

Pectic polysaccharides

Homogalacturonan (HG) / related

LM19 partially Me-HG / no ester (**34**)
LM20 partially Me-HG (**34**)
JIM7 partially Me-HG (**6,22,26**)

LM7 partially Me-HG / non-blockwise, (**24,26**)
JIM5 partially Me-HG / no ester (**1,6,22,26**)
LM18 partially Me-HG / no ester (**34**)

PAM1 blockwise de-esterified HG (**17**,22,23,**30**)
LM8 xylogalacturonan (**27**)

Rhamnogalacturonan-I

Galactan +

LM5 NRE (1→4)-β-D-galactan (**15**,18-20,**42**)
LM26 branched (1,6-Gal) (1→4)-β-D-galactan (**45**)

Arabinan +

LM6^{+} (1→5)-α-L-arabinan (**16**,18-20,23,**31,34**)
LM6-M (1→5)-α-L-arabinan (**46**)
LM13 linearised (1→5)-α-L-arabinan (**33,35**)

Other

LM16 processed arabinan/put. galactan stub (**35**)
LM9 feruloylated (1→4)-β-D-galactan (**28**)
LM12‡ ferulic acid, feruloylated pectin (**38**)

$^{+}$**May also bind to AGPs**
‡**Can also bind to feruloylated heteroxylan**

Non-cellulosic, non-pectic polysaccharides

Xyloglucan

LM15 XXXG motif of xyloglucan (**32,44**)

LM24 galactosylated xyloglucan (**38**)
LM25 XXXG/galactosylated xyloglucan (**38**)

Heteromannan

LM21 heteromannan (**36**)
LM22 heteromannan (**36**)

Heteroxylan

LM10 **NRE** (1→4)-β-D-xylan (**29,44**)
LM11 (1→4)-β-D-xylan / arabinoxylan (**29**)
LM28 glucuronoxylan (**40**)
LM12‡ ferulic acid, feruloylated xylan (**38**)
LM27 unknown epitope assoc. grass xylan (**40**)

‡**Can also bind to feruloylated pectin**

Plant cell wall proteoglycans/glycoproteins

Arabinogalactan-protein (AGP) glycan

LM2 β-linked-GlcA in AGP glycan (**13,14**)
LM14 GlcA in AGP glycan (**33,38**)
LM30 AGP glycan (**43**)
JIM4 AGP glycan (**3**,5,**13**)
JIM13 AGP glycan (**7,13**)
JIM14 AGP glycan (**7,13,44**)
JIM15 AGP glycan (**7,13**)
JIM16 AGP glycan (**7,13,44**)
MAC207 AGP glycan (**2**,3,**13**)

Extensin

LM1 extensin (**11**)
JIM11extensin (**8**)
JIM12 extensin (**8**)
JIM19 extensin (**8,9,10**)
JIM20 extensin (**8,9**)

NRE = epitope at non-reducing end of glycan

Other cell wall related MAbs

LM23 non-acetylated xylosyl in xylogalacturonan, xylan, fucoidan preps (**37,38, 39**)
LM4 pea amine oxidase, cell walls (**21,25**)
JIM18 glyco-phospholipid, membranes (**9,12**)
JIM1 β-linked-galactosyl, plasma membrane (**4**)

Brown algal cell wall polysaccharides

Fucoidan

BAM1 un-sulfated epitope present in sulfated fucan/fucoidan preparations (**39**)
BAM2 sulfated epitope present in sulfated fucan/fucoidan preparations (**39**)
BAM3 possibly sulfated epitope present in sulfated fucan/fucoidan preparations (**39**)
BAM4 sulfated epitope present in sulfated fucan/fucoidan preparations (**39**)

Alginate

BAM6 mannuronate-rich epitope (**41**)
BAM7 mannuronate-guluronate (**41**)
BAM8 mannuronate-guluronate (**41**)
BAM9 mannuronate-guluronate (**41**)
BAM10 mannuronate-guluronate epitope resistant to alginate lyase (**41**)
BAM11 ~7 guluronate residues (**41**)

If you have specific questions about our MAb specificities or use please enquire at j.p.knox@leeds.ac.uk

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MAb selections available through

Kerafast

https://www.kerafast.com/cat/799/paul-knox-phd

Biosupplies Australia

https://www.biosupplies.com.au/products/

Absolute Antibody

Recombinant forms being made available: currently LM5, LM26, LM19 & LM20
https://absoluteantibody.com/

Brown algal BAM-series of MAbs available from SeaProbes

http://www.sb-roscoff.fr/en/seaprobes

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