Production and Activity of Xylem Sap Lectin in Cucumber

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Histochemical analysis of XSP30 lectin activities
Protein removal from sections
Extraction of cucumber leaf proteins

Results

Part I: Analysis of aboveground dependent production of XSP30 in cucumber roots

Expression of XSP30 changes with plant maturity
Diurnal oscillation of XSP30 expression and protein production
Expression of XSP30 depends on the presence of an intact shoot
Involvement of the first leaf in diurnal gene expression
Oscillating XSP30 expression is related to leaf gibberellins

Part II: Analysis of histological promoter activity of XSP30 in transgenic cucumber root

Promoter sequence of XSP30
Promoter activity of XSP30 in the transgenic hairy roots

Part III: Analysis of lectin activity of XSP30 with N-linked glycans of glycoproteins

Lectin activity of XSP30
Binding of XSP30 to galactose-removed asialofetuin
Comparison of the lectin activities of XSP30 and concanavalin A
Inhibition of XSP30 lectin activity by oligo-N-acetylgalactosamine
Binding of XSP30 to cucumber leaf and stem tissue sections
Discussion

Part I: Analysis of aboveground dependent production of XSP30 in cucumber roots

Part II: Analysis of histological promoter activity of XSP30 in transgenic cucumber root

Part III: Analysis of lectin activity of XSP30 to N-linked glycans of glycoproteins

General Discussion

References

Figures

Acknowledgments
Abbreviations

AGP: arabinogalactan protein

bp: base pairs

Con A: concanavalin A

CRGRP: cucumber root-specific glycine-rich protein

cDNA: complementary DNA

DNA: deoxyribonucleic acid

Fuc: fucose

GA: gibberellic acid

Gal: galactose

GlcNAc: N-acetylglicosamine

GUS: β-glucuronidase

IAA: indole acetic acid

Man: mannose

PBS: phosphate-buffered saline

PCR: polymerase chain reaction

PIPS: 1,4-piperazinediethanesulfonic acid

RCA: Ricinus communis agglutinin

rDNA: ribosomal DNA
RNA: ribonucleic acid

rRNA: ribosomal RNA

SDS: Sodium dodecyl sulfate

SDS-PAGE: Sodium dodecyl sulfate-polyacrylamide gel electrophoresis

TAIL-PCR: thermal asymmetric interlaced polymerase chain reaction

Tris: tris (hydroxymethyl) aminomethane

Xyl: xylose.

XSP: xylem sap protein

XSP30: xylem sap protein 30 kDa