Chemical Synthesis of Oligosaccharides related to the Cell Walls of Plants and Algae

Plant cell walls are composed of an intricate network of polysaccharides and proteins that varies during the developmental stages of the cell. This makes it very challenging to address the functions of individual wall components in cells, especially for highly complex glycans. Fortunately, structurally defined oligosaccharides can be used as models for the glycans, to study processes such as cell wall biosynthesis, polysaccharide deposition, protein-carbohydrate interactions, and cell-cell adhesion. Synthetic chemists have focused on preparing such model compounds, as they can be produced in good quantities and with high purity. This review contains an overview of those plant and algal polysaccharides, which have been elucidated to date. The majority of the content is devoted to detailed summaries of the chemical syntheses of oligosaccharide fragments of cellulose, hemicellulose, pectin, and arabinogalactans, as well as glycans unique to algae. Representative synthetic routes within each class are discussed in detail and the progress in carbohydrate chemistry over recent decades is highlighted.

General information
Publication status: Published
Organisations: Department of Chemistry, Organic Chemistry
Contributors: Kinnaert, C., Daugaard, M., Nami, F., Clausen, M. H.
Pages: 11337-11405
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Chemical Reviews
Volume: 117
Issue number: 17
ISSN (Print): 0009-2665
Ratings:
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 51.08 SJR 23.414 SNIP 12.012
Web of Science (2017): Impact factor 52.613
Web of Science (2017): Indexed yes
Original language: English
Electronic versions:
Plant_glycans_revision_Manuscript_v2.pdf. Embargo ended: 10/08/2018
DOIs:
10.1021/acs.chemrev.7b00162
Research output: Contribution to journal › Journal article – Annual report year: 2017 › Research › peer-review