GLYCOSYNTHASE ASSISTED SYNTHESIS OF β-(1,3)-GLUCO-OLIGOSACCHARIDES

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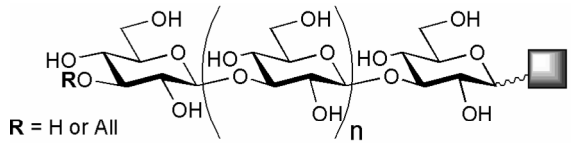
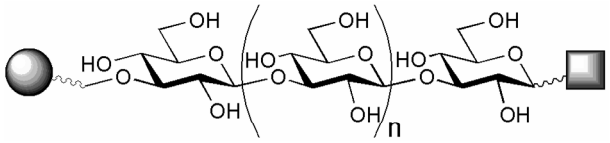
β-(1,3)-Glucans are structural cell wall polymers found in many fungi which possess immunomodulatory activities[1], they are also involved as elicitors in plant defense reactions[2]. Future studies of proteins acting on β-(1,3)-glucans will rely on oligosaccharidic probes availability. One approach to the production of these specific oligosaccharides is through 'glycosynthase' technology. Glycosynthases are generated from retaining glycoside hydrolases, in which catalytic nucleophiles are replaced with non-carboxylic amino acid residues. A β-(1,3)-glycosynthase, obtained from barley (1,3)-β-glucan endohydrolase (EC 3.2.2.39), use α-laminaribiosyl fluoride for polymerization and condensation with a variety of β-D-hexopyranoside acceptors[3, 4]. The use of a modified α-fluoride donor prevents self-condensation and permits stepwise synthesis[5]. The oligosaccharides obtained can then be transformed into labeled probes by condensation with a glycoside of interest.



Functionalizations of the non-reducing end can also lead to bi-functional fluorogenic substrates, useful in FRET studies.



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