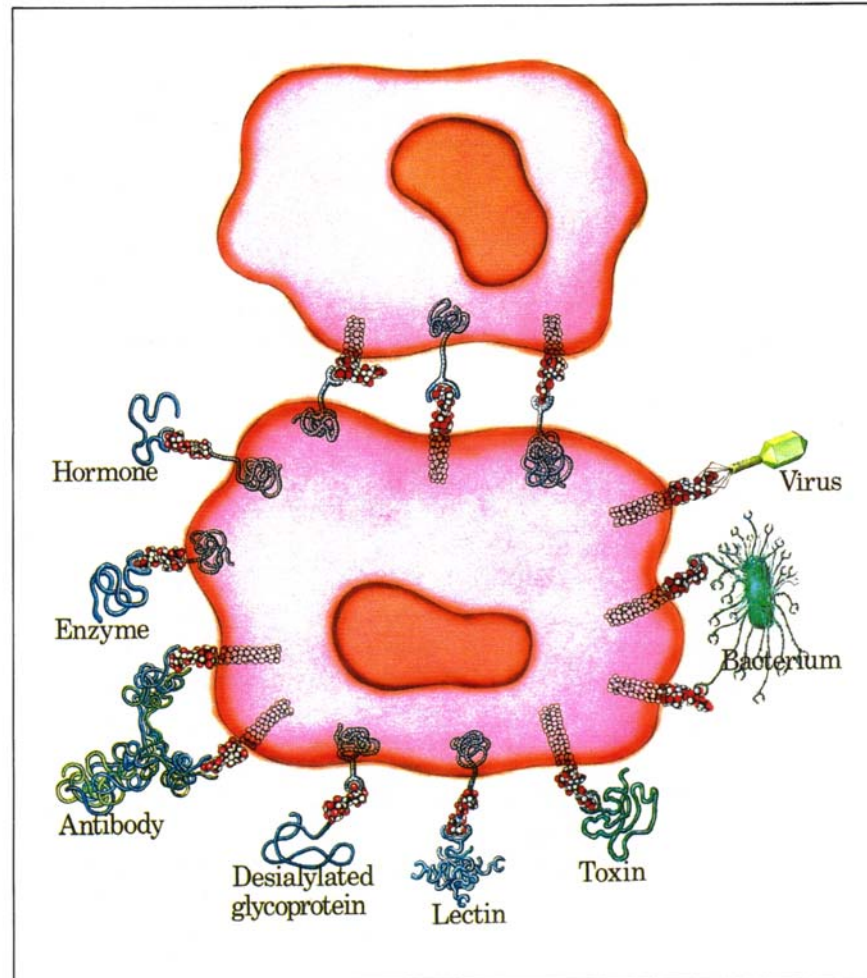


Carbohydrates – Biological relevance

Cell surface carbohydrate interactions



"The above diagram gives a schematic overview of some of the known and postulated carbohydrate interactions."

BioCarb ab

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Graduate course in
Carbohydrate Chemistry

Blood group antigens (ABH)

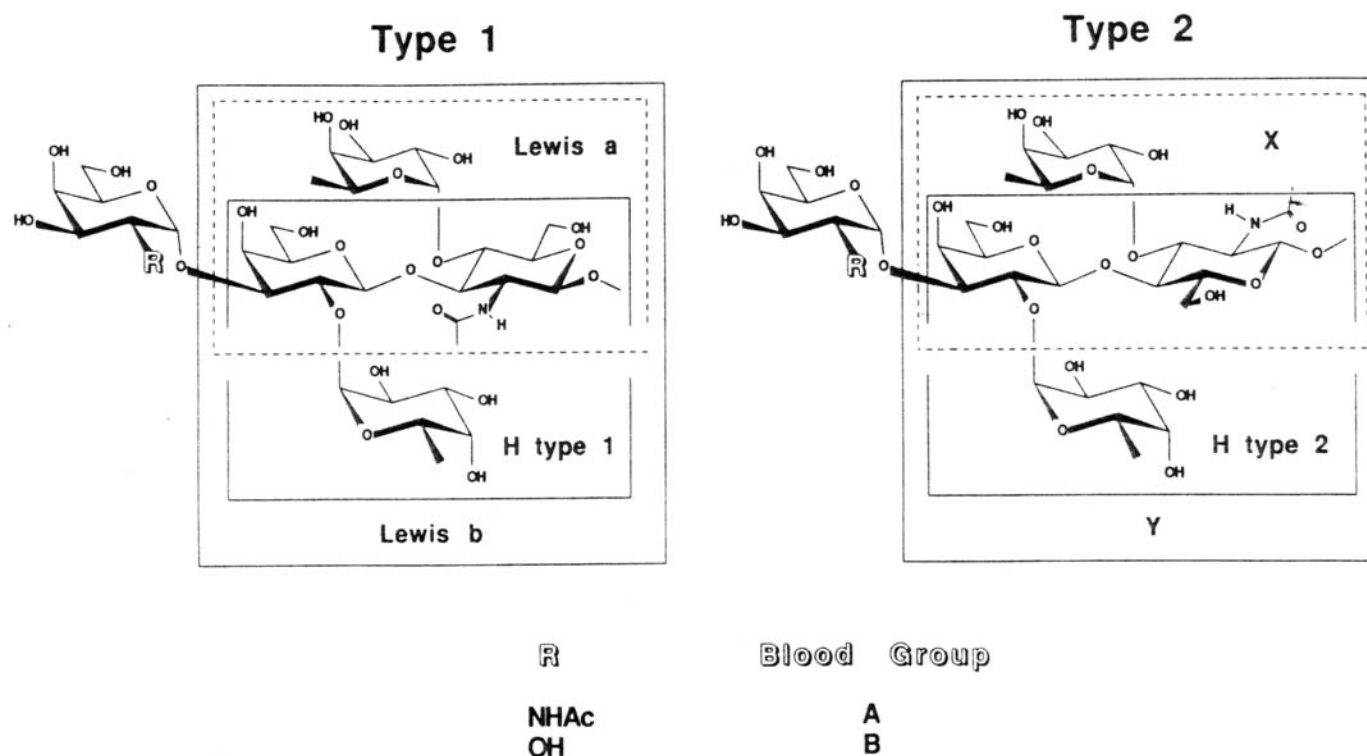
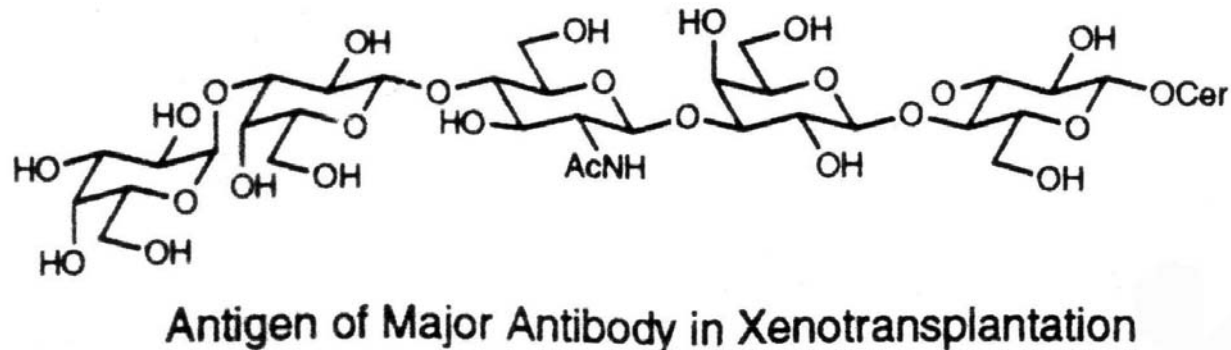
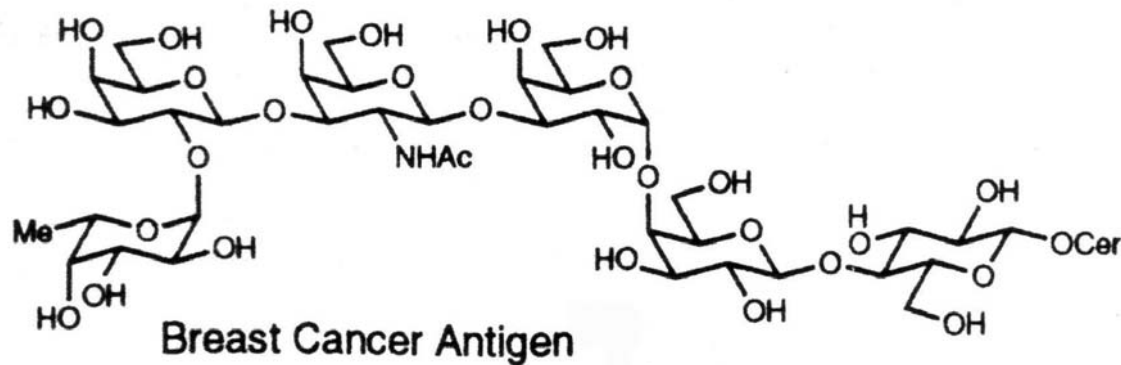
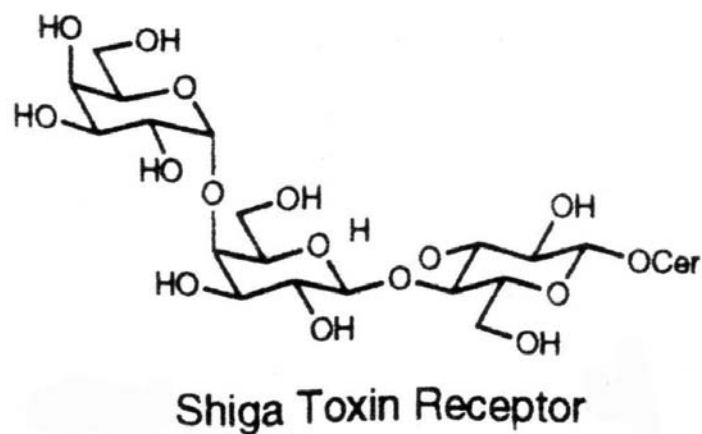
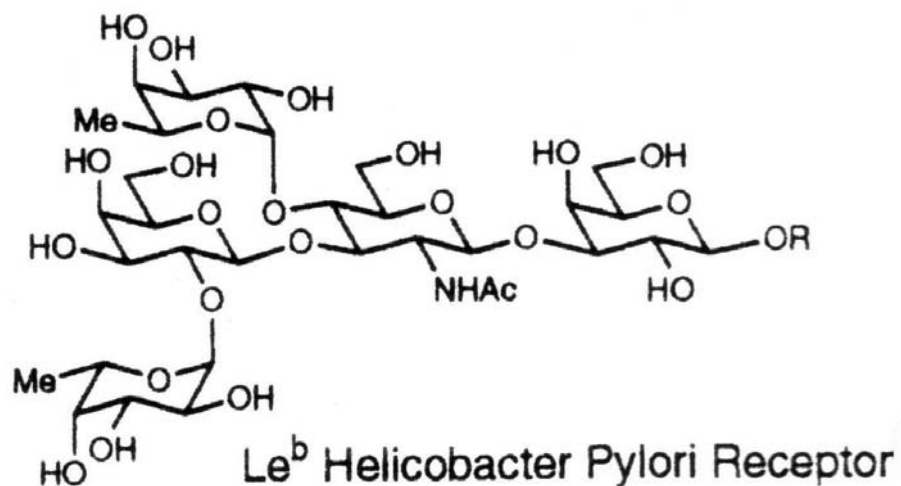


Figure 1 Composite presentation of ABH and Lewis human blood group antigenic determinants. Fucosylation of the β -D-Gal unit of the core disaccharides provides the H type 1 and H type 2 trisaccharides which are the biological precursors to the A, B, Lewis b, and Y determinants. The Lewis a and X trisaccharides arise from fucosylation of the β -D-GlcNAc unit of the type 1 and type 2 core disaccharides, respectively

Carbohydrate antigens



Receptors for bacteria and toxins



Cell wall of Gram-negative bacterium

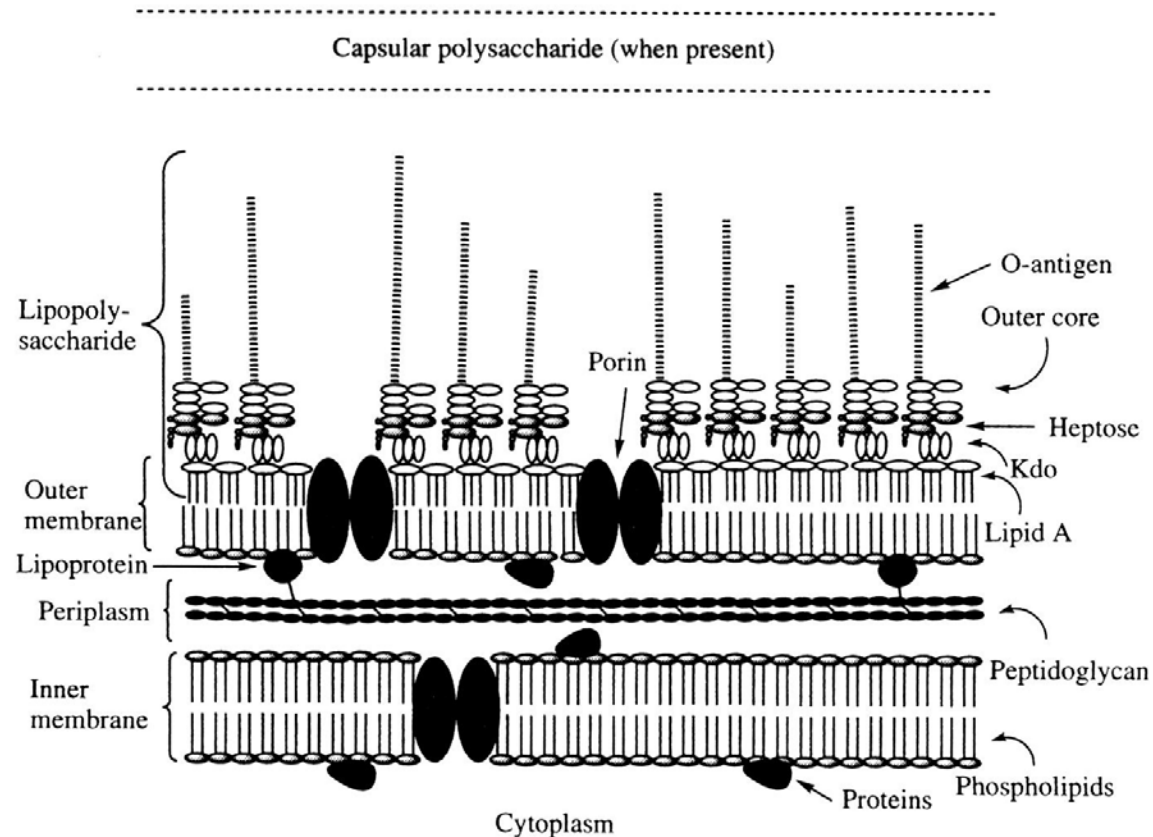
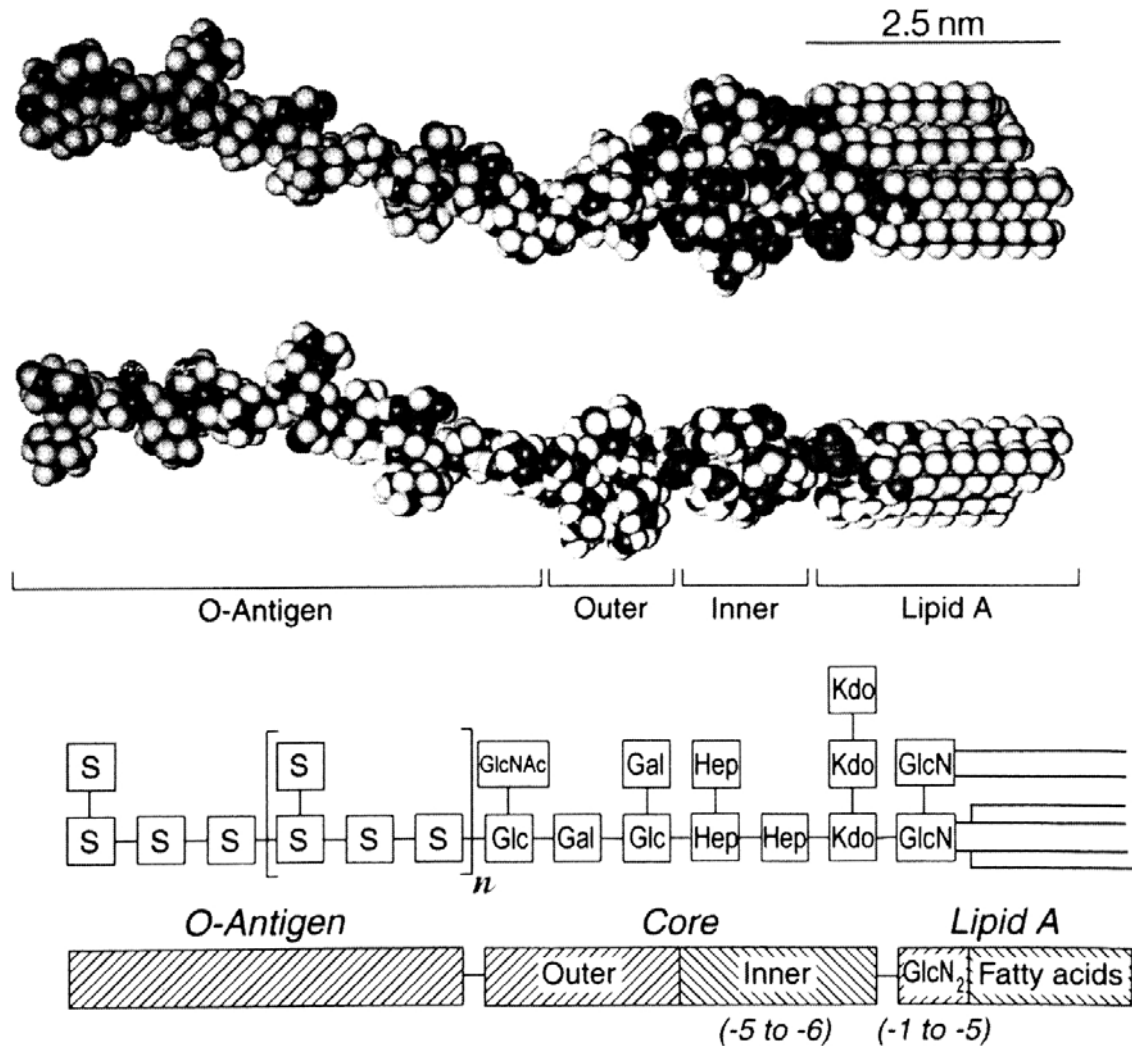
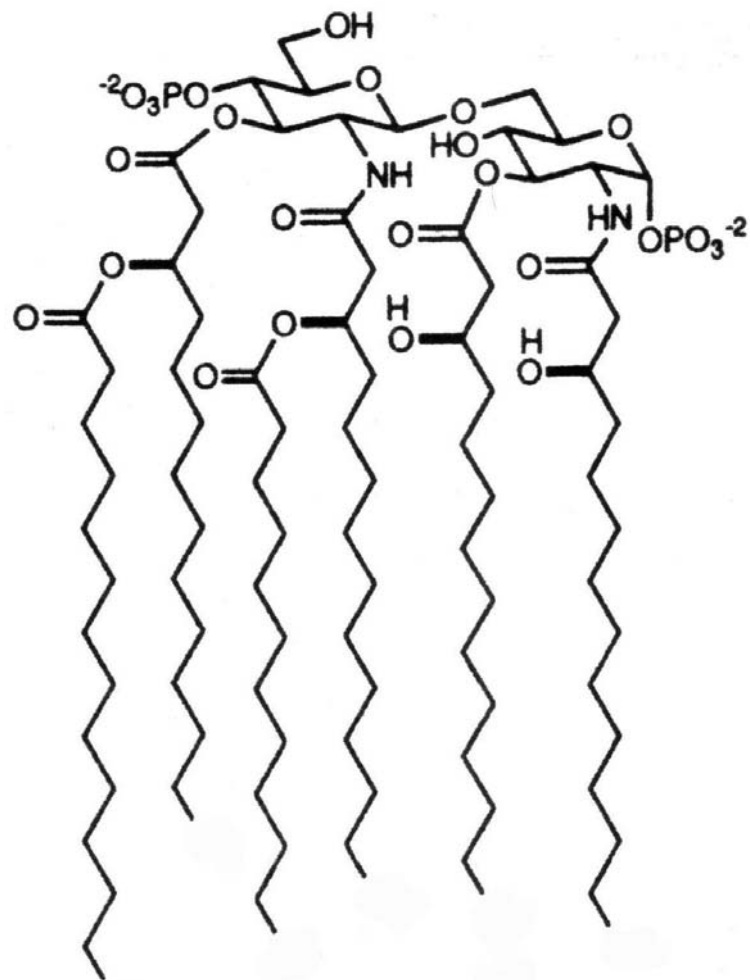


Fig. 1.1. Schematic representation of the cell envelope of a Gram-negative bacterium.

LPS, O-antigen

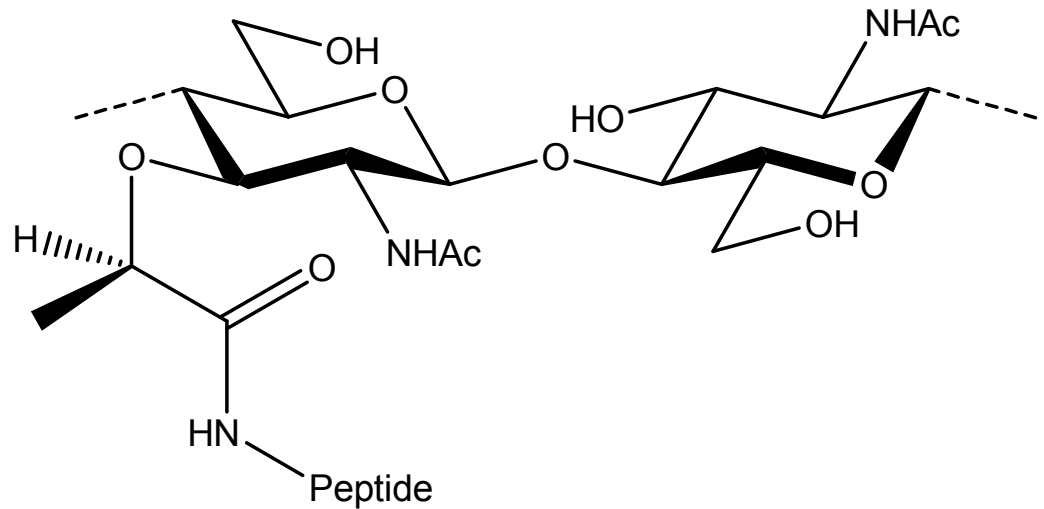
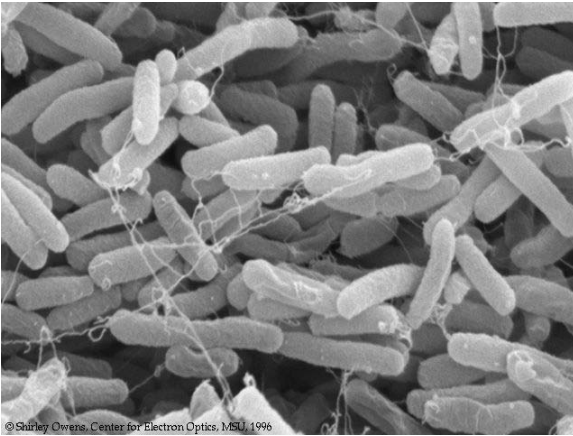


Lipid A

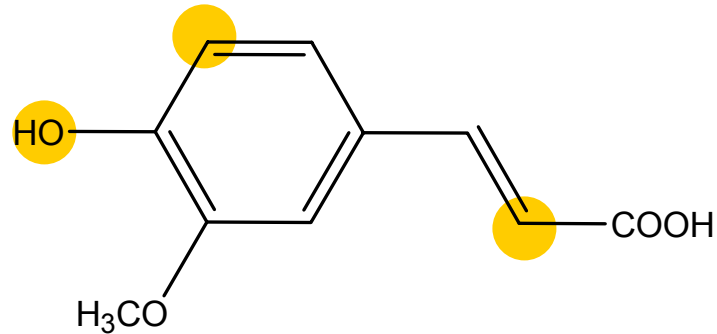
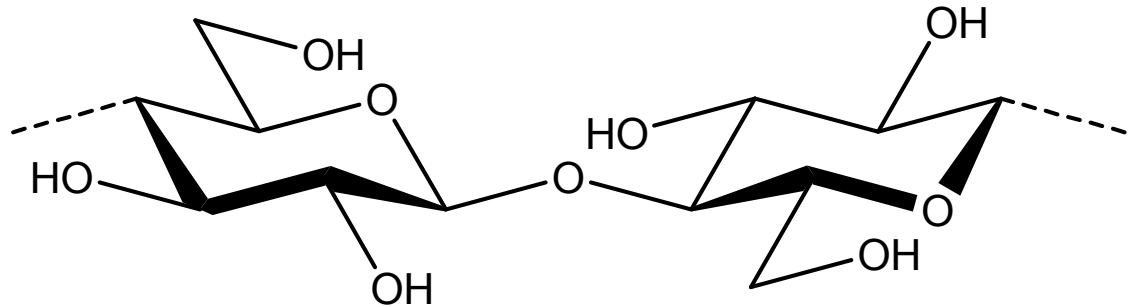


Lipid A

Peptidoglycan

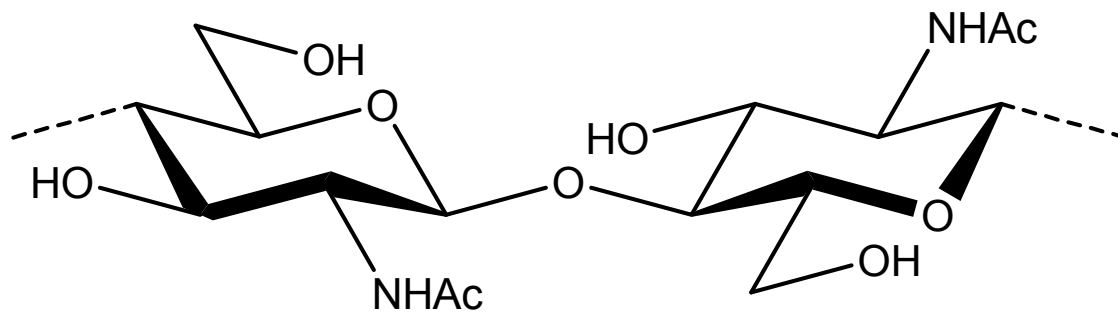


Cellulose - plants

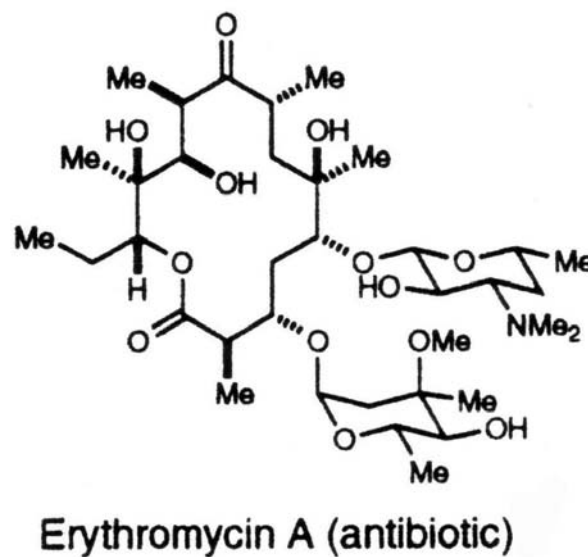
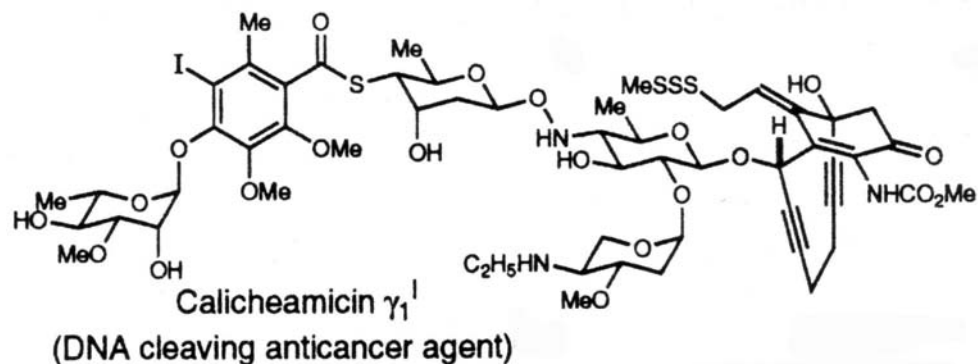


Ferulic acid – cross linking

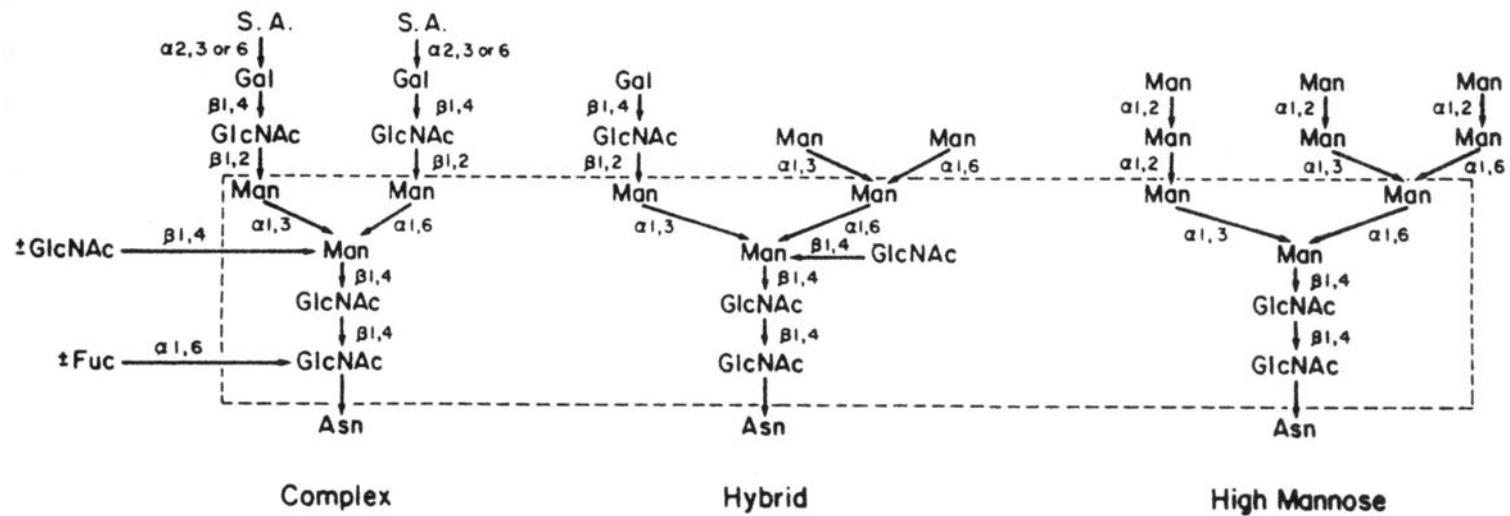
Chitin



Antibiotics



Glycoproteins



Protein folding and sorting

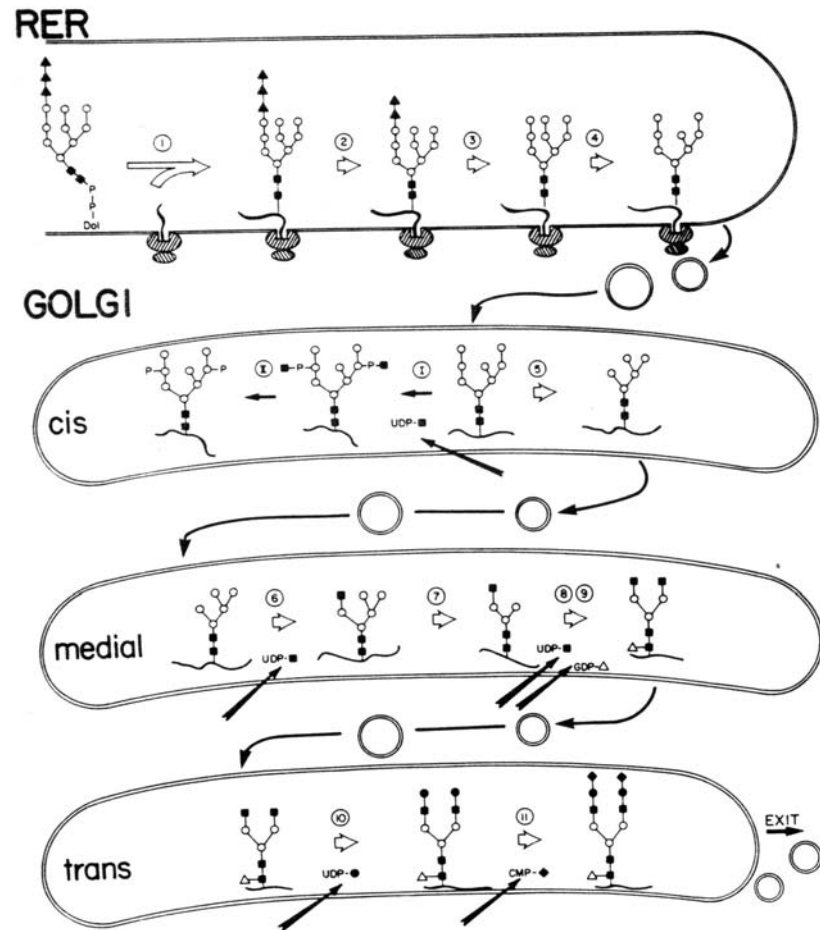
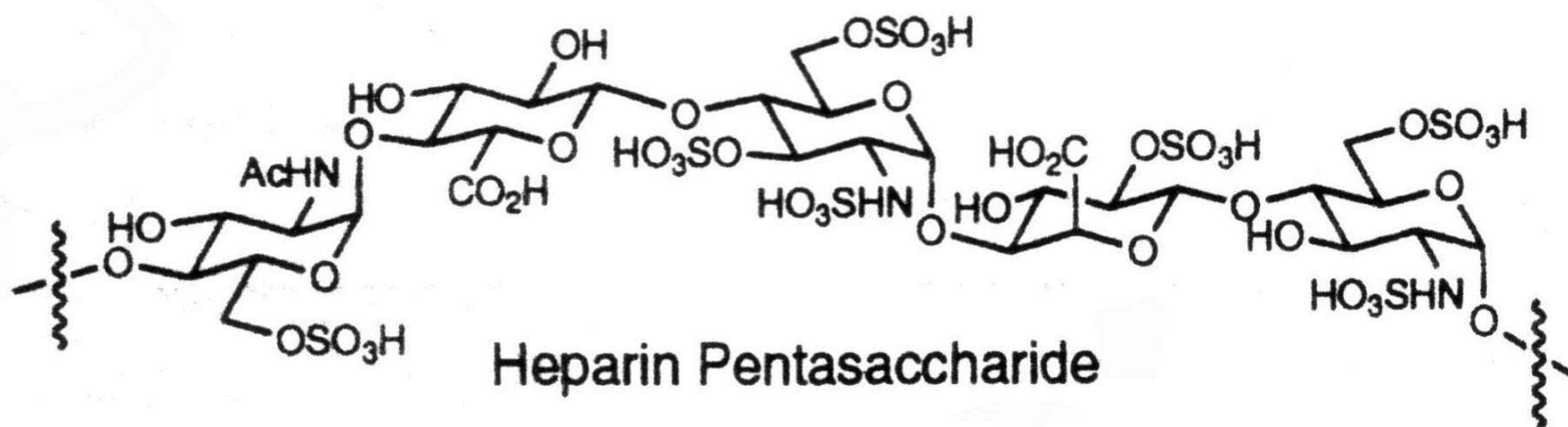


Figure 3 Schematic pathway of oligosaccharide processing on newly synthesized glycoproteins. The reactions are catalyzed by the following enzymes: (1) oligosaccharyltransferase, (2) α-glucosidase I, (3) α-glucosidase II, (4) ER α1,2-mannosidase, (5) Golgi α-mannosidase I, (6) N-acetylglucosaminyltransferase I, (7) Golgi α-mannosidase II, (8) N-acetylglucosaminyltransferase II, (9) fucosyltransferase, (10) galactosyltransferase, (11) sialyltransferase. The symbols represent: ■, N-acetylglucosamine; ○, mannose; ▲, glucose; △, fucose; ●, galactose; ◆, sialic acid.

Heparin



Proteoglycan

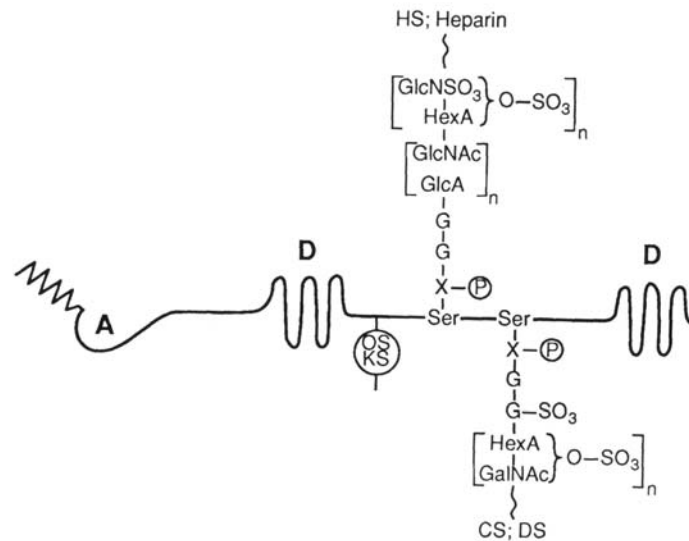


Figure 1 Conjectured model of a PG ("imagican"), which combines the structural features typical of PGs into one imaginary macromolecule. The GAG-substituted portion of the core protein is shown to carry both CS/DS and HS chains linked to serine units by galactosyl-galactosyl-xylosyl (GGX) trisaccharide sequences. Potential phosphate (P) and sulfate substitution sites on the GGX sequence are indicated. OS, oligosaccharides; KS, keratan sulfate. The anchoring (A) and other (D) domains of the core protein are described in the text. The terminal acyl substituent symbolizes the phosphatidyl inositol group that anchors certain PGs to plasma membranes, but may also indicate direct fatty acylation of the core protein (19a). For additional information see the text and Table 1.

Saponin

