

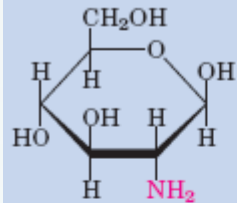
# CARBOIDRATOS

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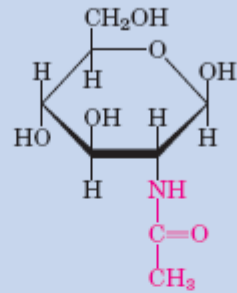
Jaqueline Garda Buffon

Bioquímica I

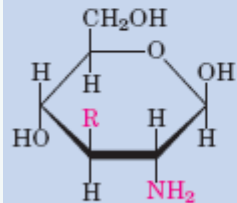
Engenharia Bioquímica



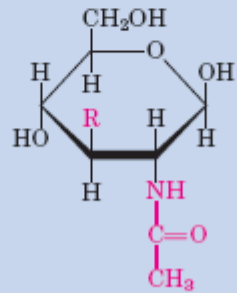
*β*-D-Glucosamine



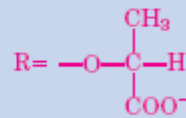
*N*-Acetyl-*β*-D-glucosamine



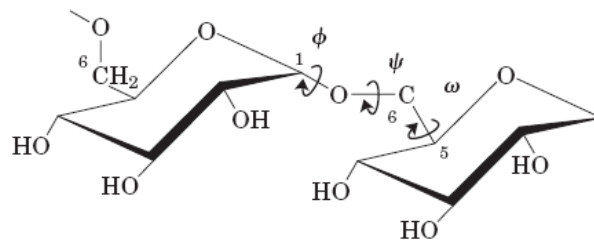
Muramic acid



*N*-Acetylmuramic acid



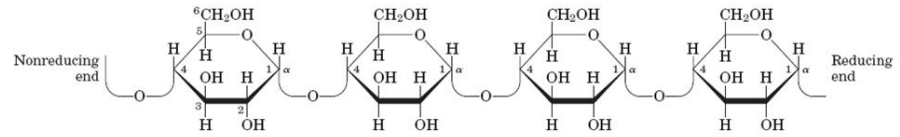
## □ Dextranas



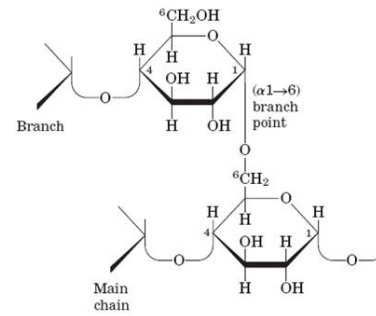
Dextran  
( $\alpha(1\rightarrow6)$ )Glc repeats, with ( $\alpha(1\rightarrow3)$ ) branches

( $\alpha(1\rightarrow6)$ )Glc repeats, with ( $\alpha(1\rightarrow3)$ ) branches  
Dextran

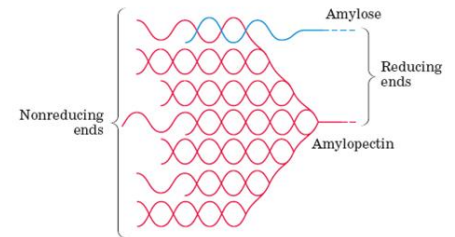
# Amido e glicogênio



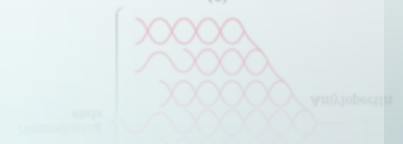
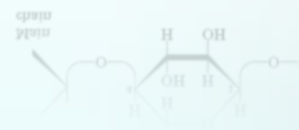
(a) amylose



(b)



(c)

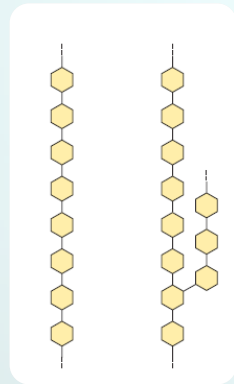


## POLISSACARÍDEO

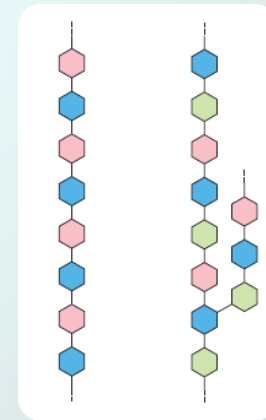
*Homopolissacarídeo; heteropolissacarídeo*

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Celulose e quitina

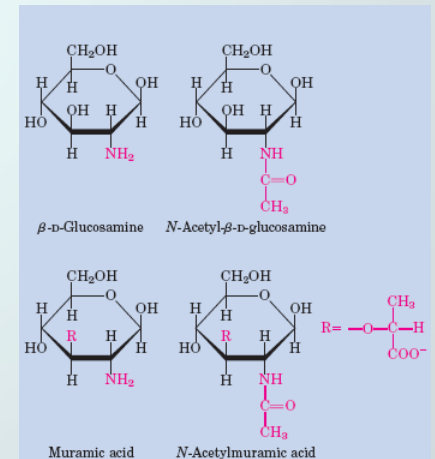
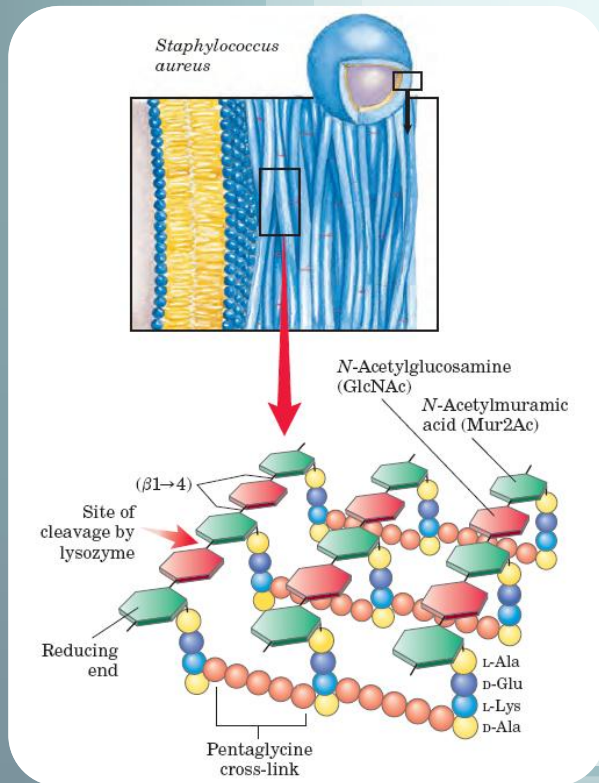


Amido e glicogênio

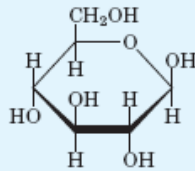


# Função polissacarídeos: parede celulares

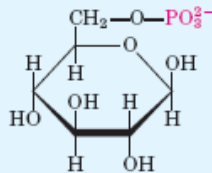
## Parede celulares bacterianas



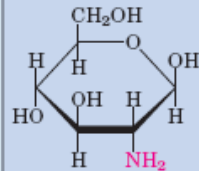
**Glucose family**



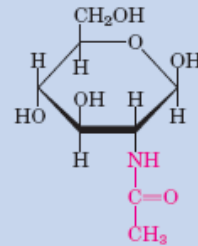
$\beta$ -D-Glucose



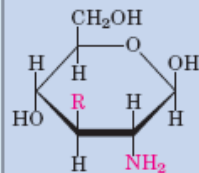
$\beta$ -D-Glucose 6-phosphate



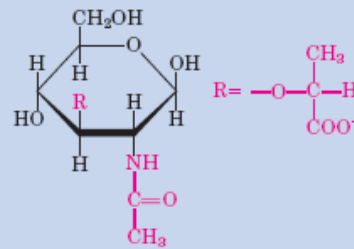
$\beta$ -D-Glucosamine



*N*-Acetyl- $\beta$ -D-glucosamine

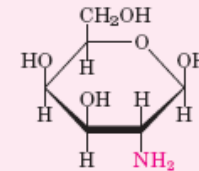


Muramic acid



*N*-Acetylmuramic acid

**Amino sugars**

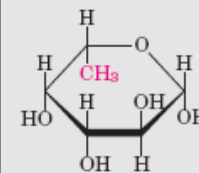


$\beta$ -D-Galactosamine

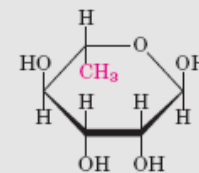


$\beta$ -D-Mannosamine

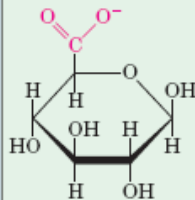
**Deoxy sugars**



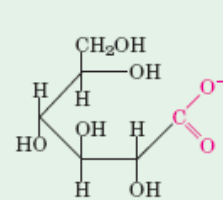
$\beta$ -L-Fucose



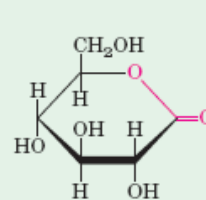
$\alpha$ -L-Rhamnose



$\beta$ -D-Glucuronate

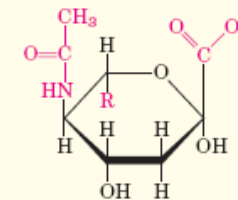


D-Gluconate



D-Glucono- $\delta$ -lactone

**Acidic sugars**



*N*-Acetylneuraminic acid  
(a sialic acid)

# Função polissacarídeos: parede celulares



Parede celulares algas

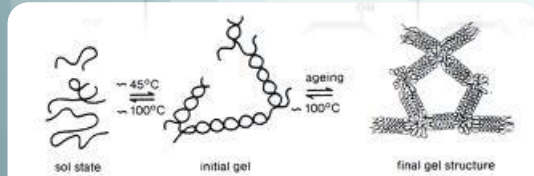
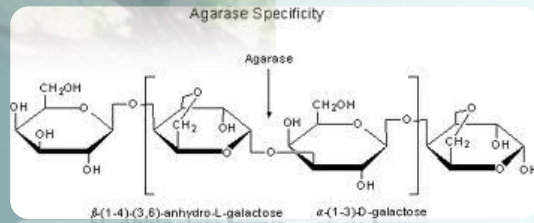
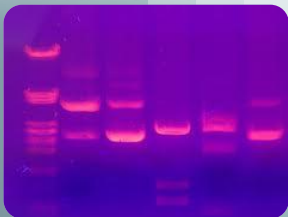
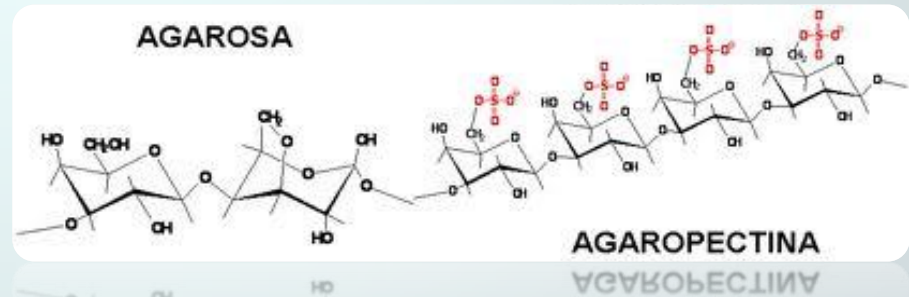


Fig. 25. Gel structure of agarose. (Låås, T. Doctoral thesis. Acta Universitatis Upsaliensis 1975. Reproduced by kind permission of the Author.)





# Função polissacarídeos: parede celulares

## Parede celulares vegetais

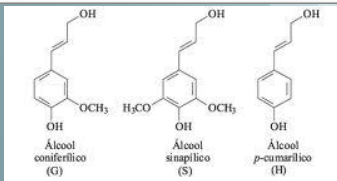
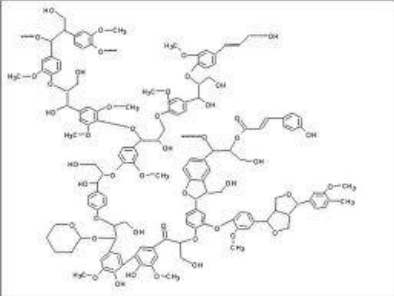
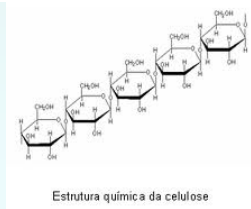
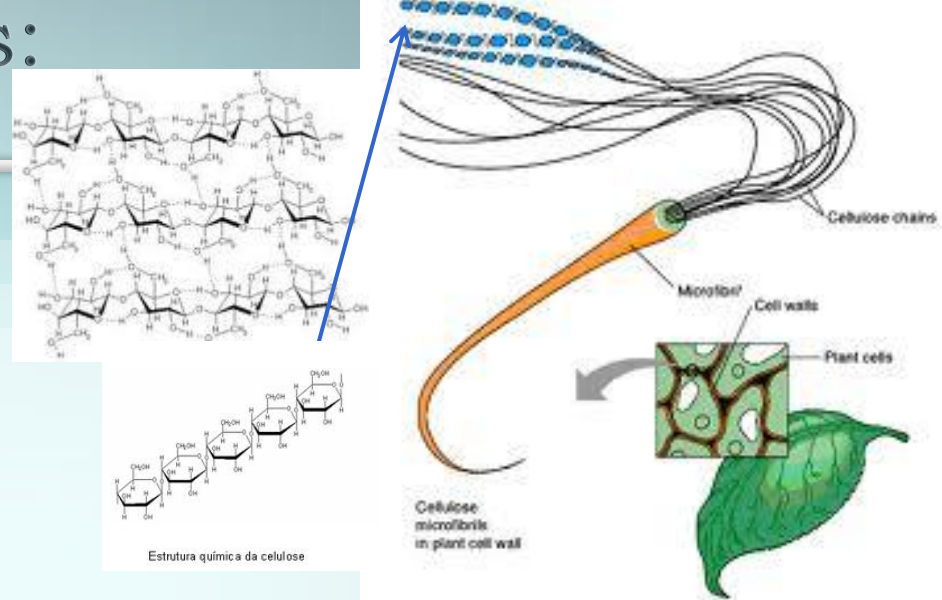
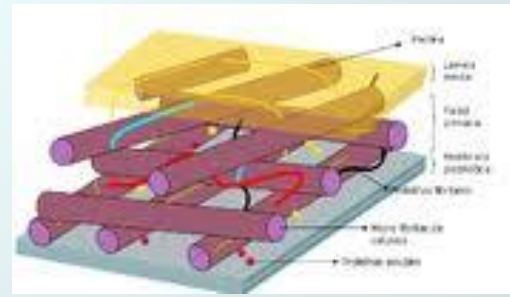
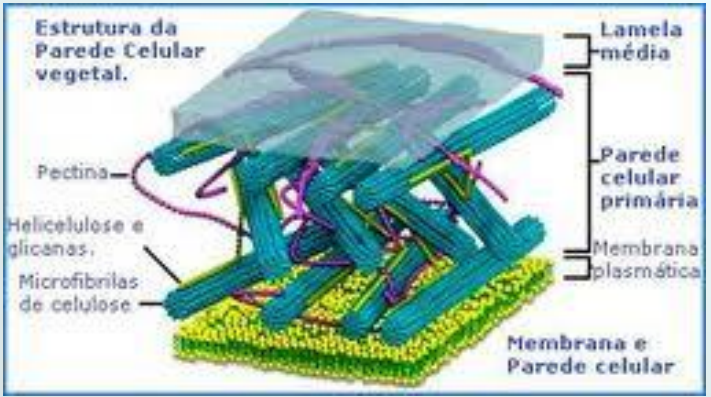
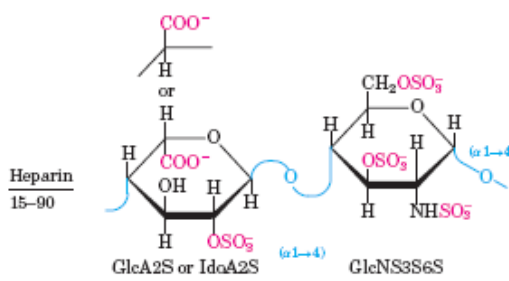
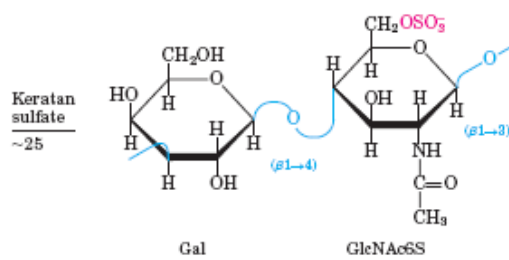
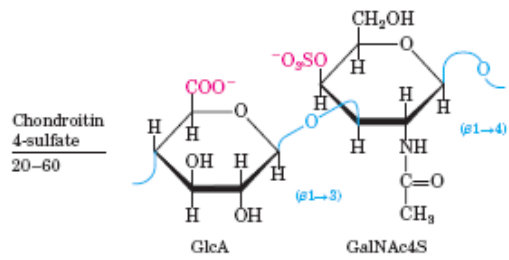
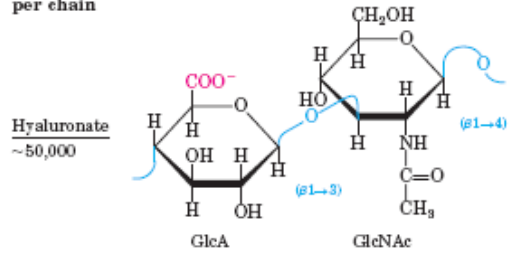


Figura 1. Alcoóis precursores das unidades fenilpropanóides guaiacila (G), siringila (S) e p-hidroxifenila (H)



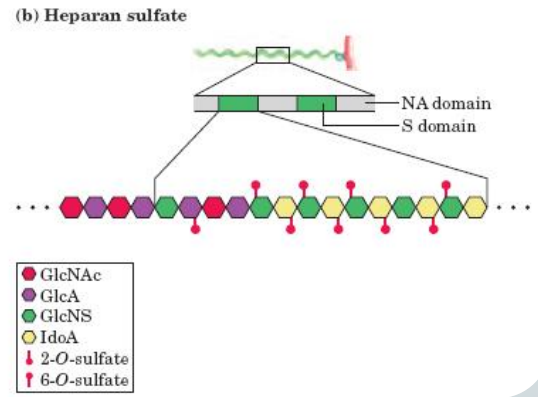
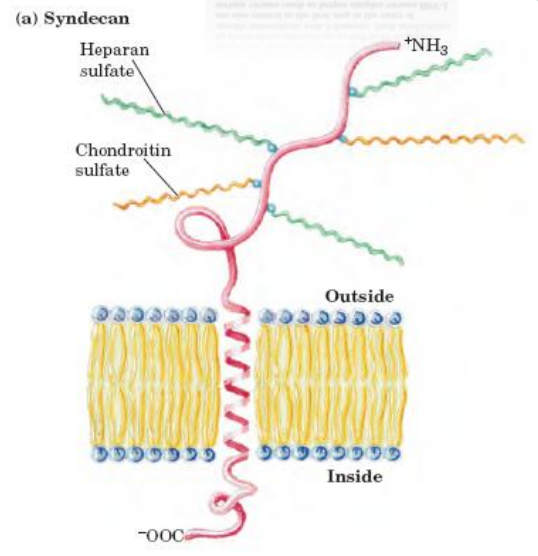
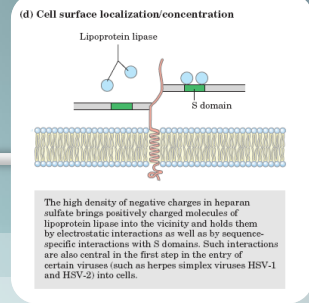
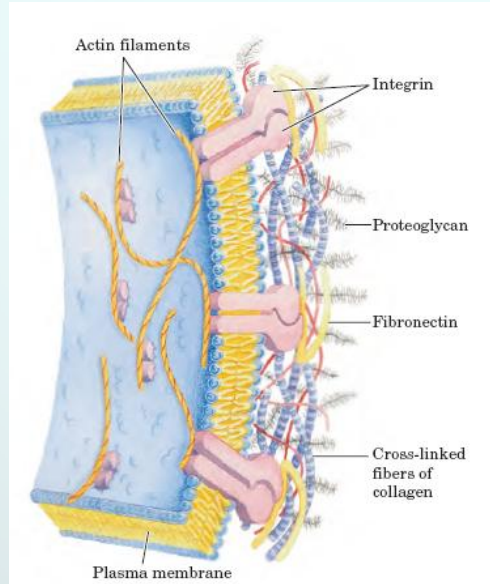
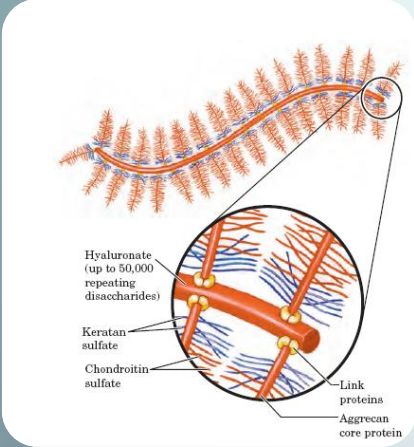
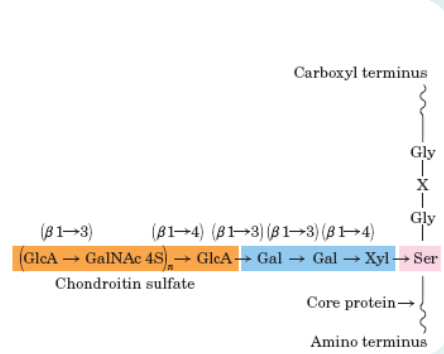
**Glycosaminoglycan    Repeating disaccharide**

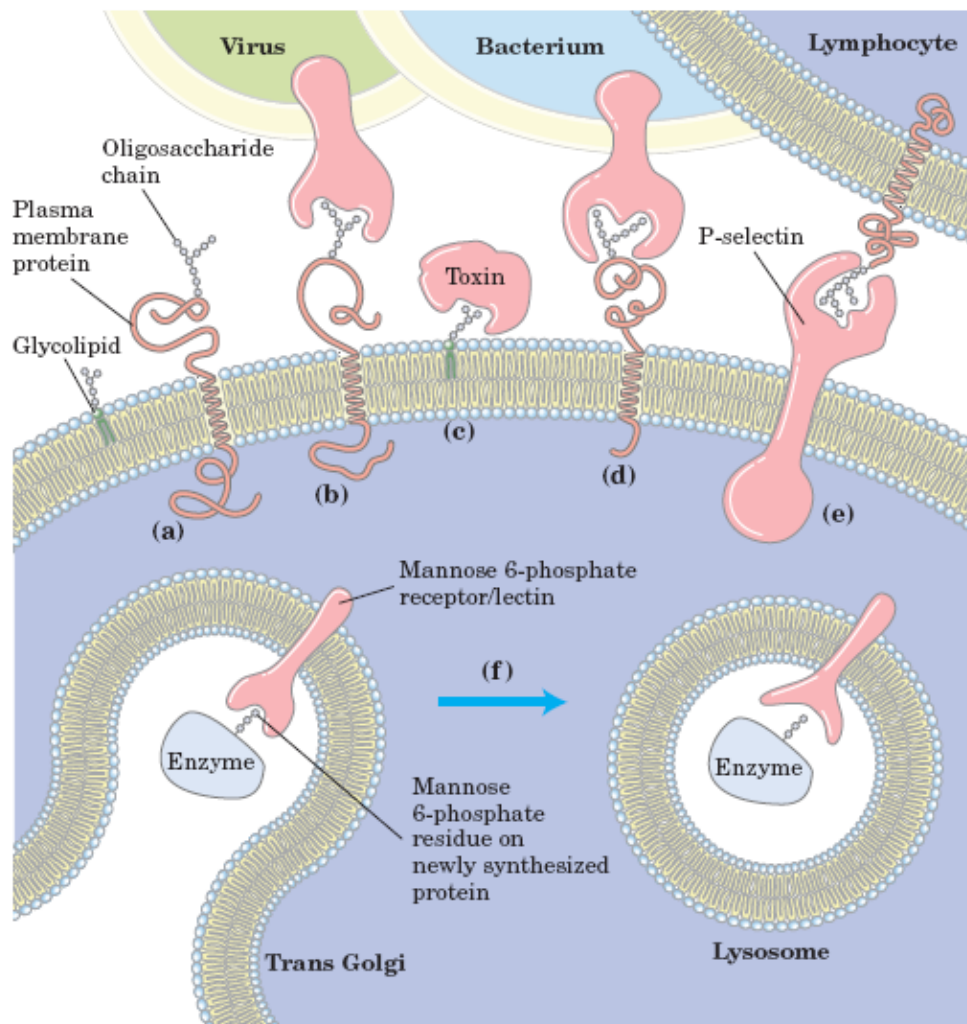
**Number of  
disaccharides  
per chain**



# GLICOCONJUGADOS

## Proteoglicanos :



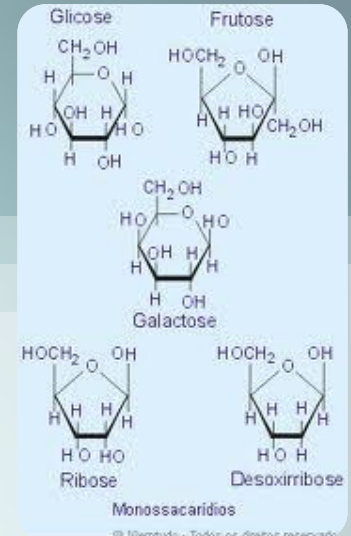
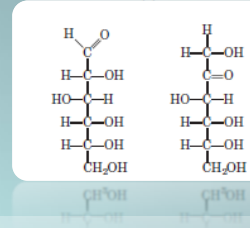
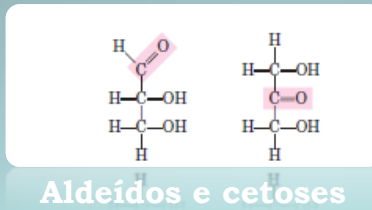


**FIGURE 7-37** Roles of oligosaccharides in recognition and adhesion at the cell surface. (a) Oligosaccharides with unique structures (represented as strings of hexagons), components of a variety of glycoproteins or glycolipids on the outer surface of plasma membranes, interact with high specificity and affinity with lectins in the extracellular milieu. (b) Viruses that infect animal cells, such as the influenza virus, bind to cell surface glycoproteins as the first step in infection. (c) Bacterial toxins, such as the cholera and pertussis toxins, bind to a surface glycolipid before entering a cell. (d) Some bacteria, such as *H. pylori*, adhere to and then colonize or infect animal cells. (e) Selectins (lectins) in the plasma membrane of certain cells mediate cell-cell interactions, such as those of T lymphocytes with the endothelial cells of the capillary wall at an infection site. (f) The mannose 6-phosphate receptor/lectin of the trans Golgi complex binds to the oligosaccharide of lysosomal enzymes, targeting them for transfer into the lysosome.

transfer into the lysosome.  
 lysosomal enzymes' binding them for  
 complex binds to the oligosaccharide of  
 e-phosphate receptor/lectin of the trans Golgi

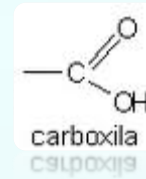
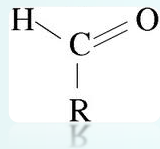


# Reações de monossacarídeos

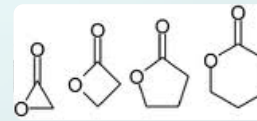


## □ Reações de Oxidação:

### ■ ALDEÍDOS

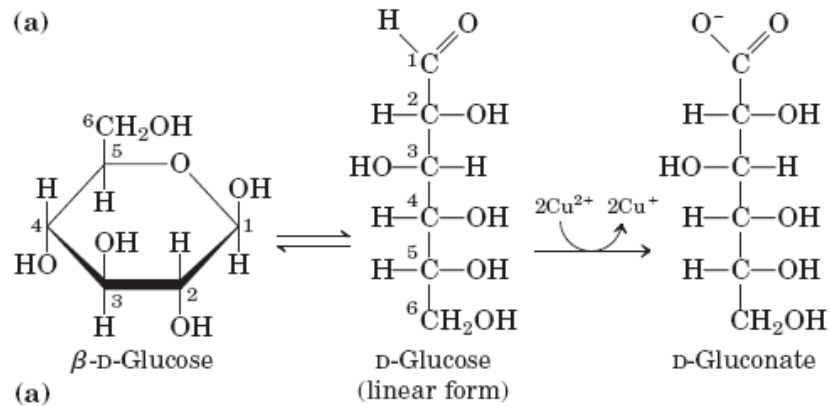


### ■ CETOSSES

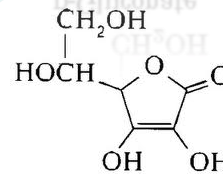


□ Reação de oxidação:

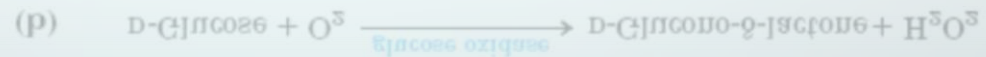
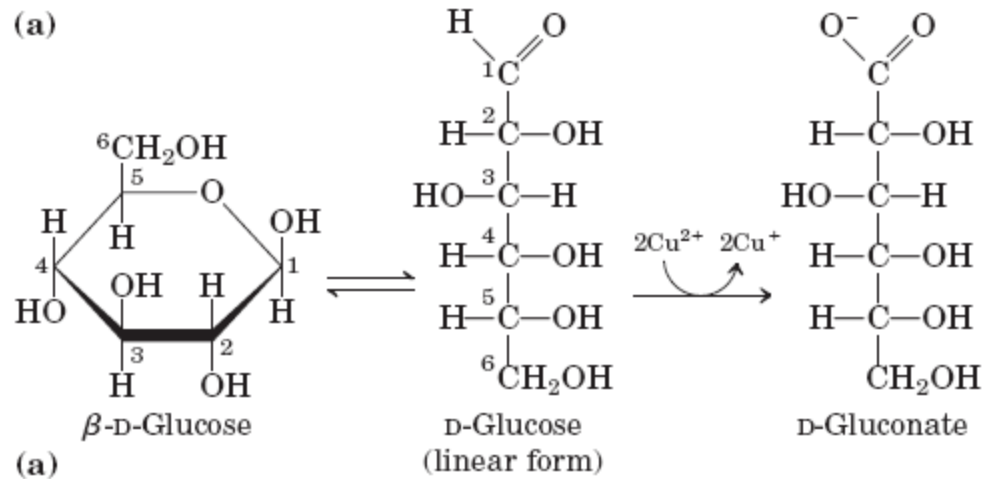
□ aldose → lactona



Lactona: vitamina C

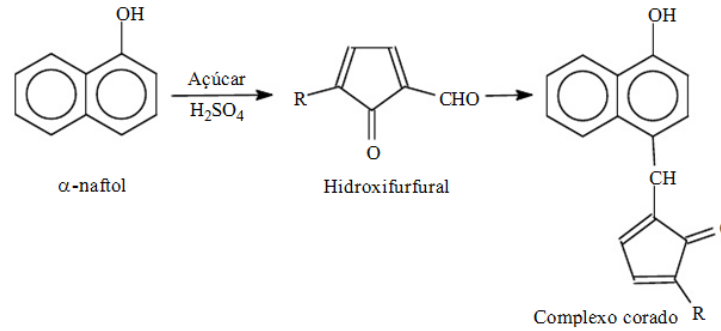


# Reações de monossacarídeos

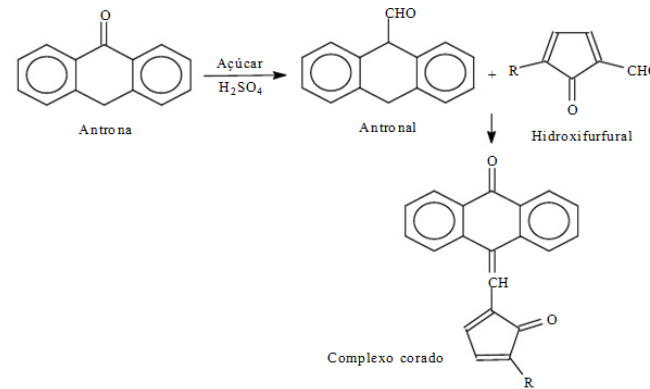


# Reações de monossacarídeos

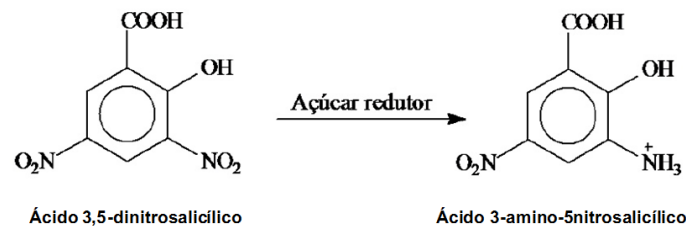
Molish



Antrona



DNS

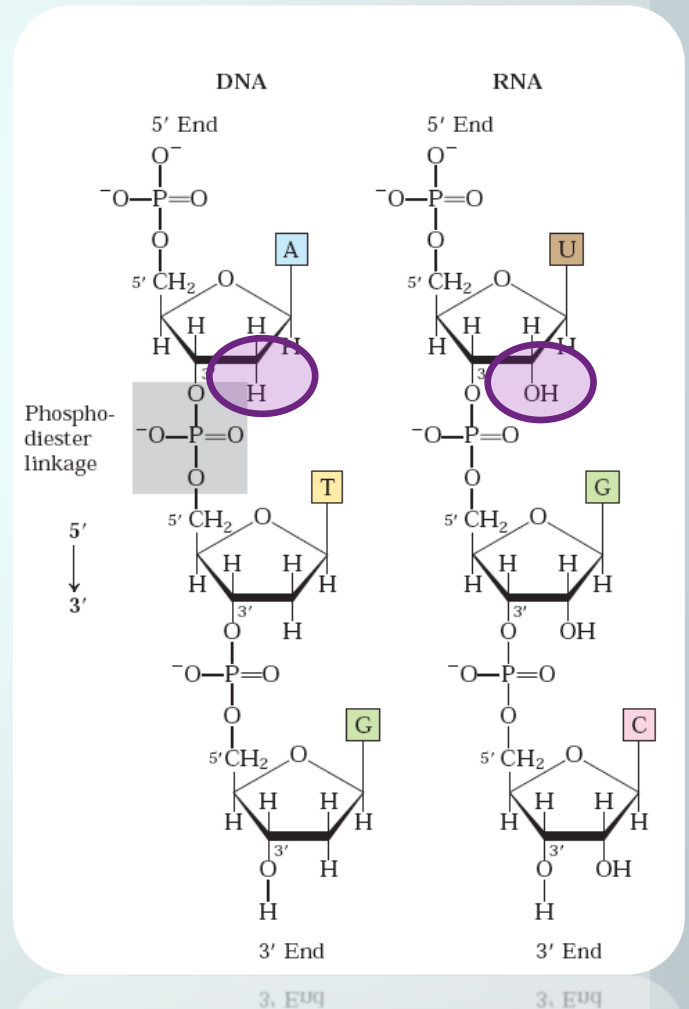
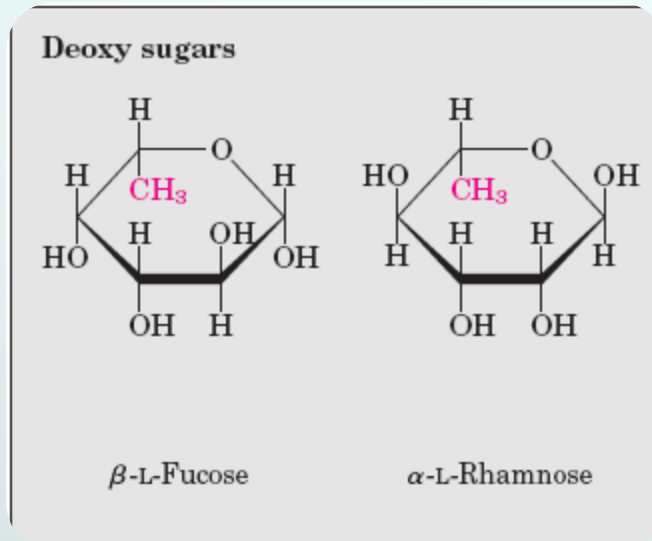




# Reações de monossacarídeos

- Reação de redução:  
açúcares tb são reduzidos

Desoxiaçúcares (-OH → H)



## Métodos mais usuais

- Reagente de Tollens ( $\text{Ag}(\text{NO}_3)_2^+$ )
- Enzima Glicose oxidase
- Reagente ácido dinitrosalicílico (Miller – 1959)
- Método de Fehling
- Método de Antrona (Yemm & Willis – 1954)

# Métodos para análise de carboidratos

