

# Glycoproteins

**Glycoproteins** (the older term mucoproteins) are proteins that contain a sugar ( saccharide ) component in their molecule, which is attached in varying amounts, as a short or long branch or an unbranched chain (oligosaccharide chain). The weight share of carbohydrates in the molecule is **1% to 85%** . They have a mostly neutral character

The protein carrier is synthesized on the rough ER , and carbohydrates are attached to it in the GA in two ways:

1. O-glycosidic bond to the OH group of Serine or Threonine of the protein using N-acetylglucosamine of the carbohydrate chain
  2. By N-glycosidic linkage to the NH<sub>2</sub> (N-amide) group of the Asparagine protein by means of N-acetylglucosamine, to which the carbohydrate chain has been transferred from the dolichol pyrophosphate carrier, the group of N-linked glycoproteins includes membrane-bound glycoproteins as well as circulating glycoproteins
- degradation in lysosomes by **endoglycosidases** (fucosidase, aspartylglucosaminidase) and **exoglycosidases** (galactosidase, neuraminidase, hexosaminidase, mannosidase)

## Occurrence

- body fluids
- tissues
- cell membranes

## Task

Glycoproteins have a very wide range of roles, whether they are structural, receptor or enzymatic functions.

They participate in **cellular recognition** as specific receptors. It is located on the surface of all eukaryotic cells , while their protein component anchors the glycoprotein to the membrane and the carbohydrate component serves as a receptor .

## Structural sugars of glycoproteins

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### Hexoses

- Mannosa (Man)
- Galaktosa (Gal)

### Acetylhexosamines

N-Acetylglucosamine (GlcNAc)

N-Acetylgalactosamine (GalNAc)

### Pentoses

- Arabinosa (Ara)
- Xylose (Xyl)

### Methylpentoses

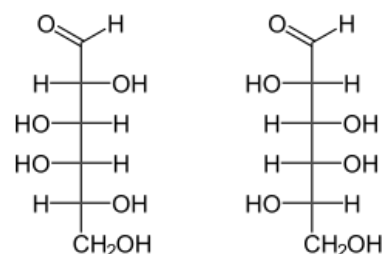
- L-Fucose (Fuc)

### Sialic acids

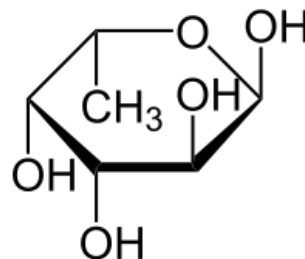
- N-Acyl derivatives of neuraminic acid

Glucose does not occur in mature glycoproteins (except collagen ). The monitoring of glycosylated proteins in plasma helps in the long-term monitoring of diabetes therapy.

Iron



D-Galactose      L-Galactose  
Chemical formula of D-galactose and L-galactose



Chemical formula of L-Fucose

## Links

### Related articles

- Glycoproteinosis

## External links

- Glykoproteiny (česká wikipedie)
- Glycoprotein (english wikipedia)

## References

- MURRAY, Robert K., Daryl K. GRANNER, and Peter A. MAYES, et al. *Harper's BIOCHEMISTRY*. 4th edition. Jinočany : H+H, 2002. ISBN 80-7319-013-3 .