

The role of Galactose in human health and disease

Review Article

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Abstract: According to the universal biological findings, cellular bodies are covered with an intense coating of glycans. Diversity of glycan chains, linked to lipids and proteins is due to isomeric and conformational modifications of various sugar residues, giving rise to unique carbohydrate structures with a wide range of sequences and anomeric configurations. Proteins and lipids, carrying specific sugar residues (like Galactose) with particular stereochemical properties (sequence, anomery and linkages) are involved in broad spectrums of biological processes, including intercellular and intracellular interactions, microbial adhesion and cellular signalling. By studying the role of specific stereochemical features of galactose (Gal), we have improved our understanding about the normal physiology and diseases in human bodies.

Keywords: D-Galactose • Sequence, anomery and linkages • Health • Diseases

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Abbreviations

Different dietary and non dietary factors and genetic su
Gal, Galactose; GalNAc, N-acetylgalactosamine;
GalNAc-ol, N-acetylgalactosaminitol; Glc, Glucose;
Fuc, Fucose; GlcNAc, N-acetylglucosamine;
Man, Mannose; Neu, Neuraminic acid;
Cer, Ceramide; Neu5Gc, 5-Glycolyl neuraminic acid;
M. pneumonia, *Mycoplasma pneumonia*;
P. granulosum, *Propioni granulosum*;
N. gonococcus, *Neisseria gonococcus*;
E. histolytica, *Entamoeba histolytica*;
H. pylori, *Helicobacter pylori*;
E.coli, *Escherichia coli*;
Siglecs, Sialic acid binding Ig-like lectins.

1. Introduction

Cellular and molecular biology in standard medical curriculum still carry the Crick's 1970 view (DNA makes RNA makes proteins), along with the explanations of cells and tissues. This description is carrying a solid impression for physicians and medical students that the nucleic acids, lipids and proteins are the only cellular components of human body. Additionally, little description of glycans in preclinical text books and inadequate training of medical students in this field have enhanced this historical obscurity in the minds of medical students and physicians. In the recent few years, carbohydrate study has emerged from this orthodox obscurity, raising the specialized field of glycobiology [1-3].

The glycans being prominently and ubiquitously distributed on the cell surface and secreted biomolecules in biological systems are associated with a wide range

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