LEIDEN UNIVERSITY MEDICAL CENTER

Safe and efficient novel methodologies for labelling of N- and O-glycans for Chromatographic, Electrophoretic and Spectroscopic Analysis

Market Sector: Biochemistry, Analysis

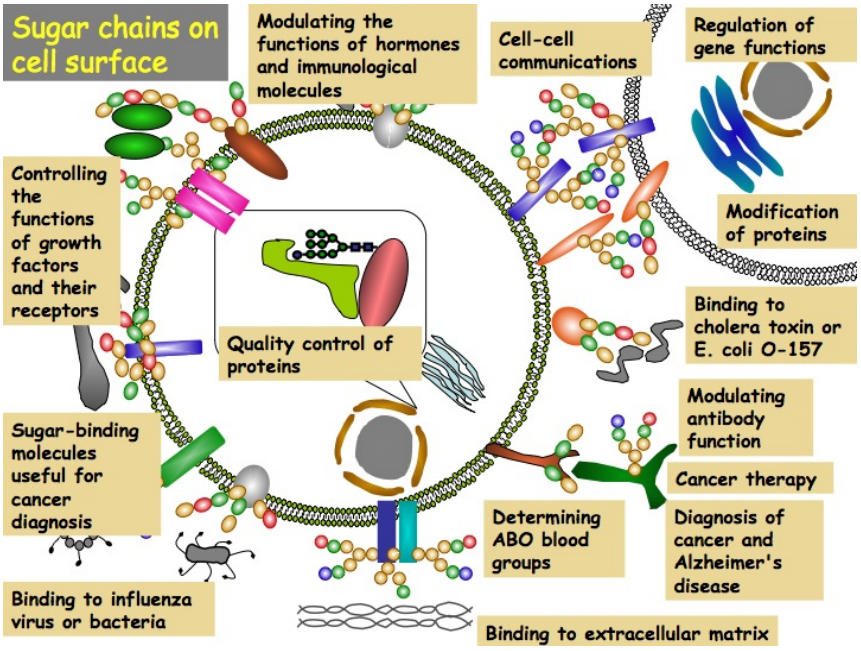

Fig. 1 Overview of the diverse functions of glycans
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Scientists from Leiden University Medical Center have developed novel methodologies for the labeling of glycans. Protein-linked glycans are involved in important biological processes such as cellular differentiation, recognition and adhesion, receptor activation, and molecular trafficking. Moreover, O-glycosylation specifically plays an important role in mucosal secretion, whilst N-glycosylation is important for the folding of eukaryotic proteins. Research on the role of glycans in drug therapy and their use as biomarkers demands for fast and sensitive high-throughput glycoanalytical methods. The most common approaches include HPLC and capillary electrophoresis both of which are mostly coupled to UV, fluorescence or mass spectrometric detection. In most approaches, glycans are labeled prior to analysis.

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Conventionally N-glycans have been labeled by reductive amination using sodium cyanoborohydride ($NaBH_3CN$) as reducing agent. This reaction releases the toxic, volatile compound hydrogen cyanide as a side product. Scientists from Leiden University Medical Center have now developed an alternative non-toxic approach for the labeling of N-glycans. Customary methodologies for labeling O-glycans are demanding in terms of both time and equipment. Also for this specific problem scientists from Leiden University Medical Center have designed a fast method for the release and labeling of O-glycans followed by a simple sample work-up and mass spectrometric analysis.

Keywords

Chemistry, methodology, mass spectrometry, labeling, glycans.

Current study

The scientists have validated the efficacy of these novel methodologies in comparison to state of the art techniques.

Commercial Partner

Suppliers of laboratory materials and kits in the field of analytical chemistry, glycoproteomics, HPLC and MAS.

Key Benefits

- Labeling of N-glycans: non toxic end product.
- Labeling of O-glycans: faster and easier methodology.

Applications

Glyco-analysis: Chromatographic, Electrophoretic and Spectroscopic Analysis of oligosaccharides.

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Leiden University Medical Center (LUMC) is strongly committed to the advancement of health care, through research and innovation. In particular, the focus is on translational research, with the overall aim to accelerate transfer of findings from the laboratory to clinical application, and to the market. LUMC has a reputation as a pioneering institute in its field, both nationally and internationally.