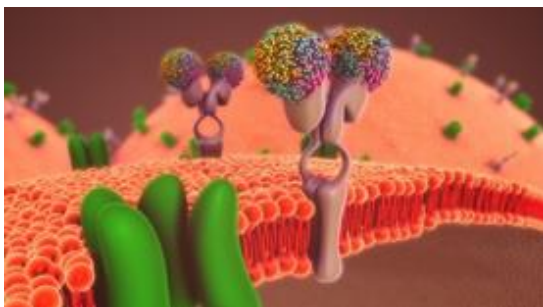


Method for Producing reduced Glycans and Glycan-arrays

N-glycans, reduced glycitols, glycosylamines, 1-amino-glycitols, glycomics

DESCRIPTION OF TECHNOLOGY

Glycosylation is the most abundant post-translational protein modification, playing an important role in protein folding, stability and function. Current methods for glycosylation analysis do not allow for a simultaneous assessment of the protein and the glycan (sugar) portion of a glycosylated protein. This is a major drawback for the investigation of glycosylation and for engineering and quality control of therapeutic proteins.



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The invention presented here provides an improved method for the preparation of multiple types of glycans and their usage for scientific and medical applications. This new method of reductive

alkaline hydrolysis provides simultaneous access to reduced glycitols, glycosylamines, reducing N-glycans and reduced 1-amino-glycitols. The core-process is the reaction of the glycoprotein starting material with borohydride in the presence of a base at 50 °C or higher. By use of this process glycoproteins resp. glycopeptides can be completely deglycosylated. If used in a preparative manner, the glycans provided by the process can be used for manufacturing glycan-arrays or glycan affinity matrices for scientific or medical use.

SCOPE OF APPLICATION

The pool of glycans accessible herewith can well be used for manufacturing glycan arrays which may then be used for scientific or medical purposes, e.g. for testing the suitability of donor and recipient for organ transplantation.

AT A GLANCE ...

TECHNOLOGY FIELD

Production and usage of glycans

BRANCH

- Pharmacy
- Science (med. / biol.)
- Production of affinity matrices for carbohydrate binding proteins / glycan arrays

USP

- Feasible access to natural glycans
- Broad product spectrum
- Wide applicability for medical/scientific purposes

DEVELOPMENT STATUS

- ✓ Proven on laboratory scale
- Next steps: Screening for further glycans and implementing on production scale

PATENT PORTFOLIO

EP-Priority application filed on Jun. 21st, 2017.

REFERENCE NO.: **TM 963**

They may also be used as diagnostic tools for numerous other diseases and disorders, even cancer. Glycan arrays are also a powerful tool for the high-throughput elucidation of interactions of carbohydrate structures with biological targets including antibodies, proteins, viruses and cells. This technique is especially suitable for glycomics studies, for these arrays present carbohydrate ligands in a manner that mimics interactions at cell-cell interfaces.

Glycan affinity matrices may be used for the isolation of specific carbohydrate proteins or the fractionation of cells depending on their repertoire of glycan binding surface proteins.

Besides for the production of glycan arrays, the method can also be directly used for structure determination, for it provides stable sub-structures of the protein starting material which can then easily be separated and analyzed, e.g. via HPLC, MALDI-TOF etc.

ADVANTAGES COMPARED TO STATE OF THE ART

The product ratio between unreduced sugars (either regular sugar-moieties or glycosylamines) and reduced sugars (1-amino-glycits resp. glycits, i.e. reduced glycans) can be easily varied by variation of temperature and/or concentration of alkali resp. borohydride.

Further major advantages are the avoidance of using hydrazine (dangerous poison) or enzymes (expensive) for the isolation of glycans.

DEVELOPMENT STATUS

The performance of the method as well as its general applicability for numerous natural substrates (glycoproteins) has been thoroughly proven on laboratory scale.

MARKET POTENTIAL

According to a recent posting at wallstreet:online^{*)} the global market for glycomics/glycobiology is expected to reach 2.1 billion US-\$ by 2025. Thus the technology may be attributed a quite large market potential.

OFFER

On behalf of the Universität für Bodenkultur Wien, TransMIT GmbH is looking for cooperation partners or licensees in Europe, USA and Asia.

^{*)} <https://www.wallstreet-online.de>, dated May 11th, 2017 and referring to a recently published report by Grand View Research, Inc.. (viewed on Jul. 26th, 2017).

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