

// NON-RANDOM CHITOSANS

Ref-Nr: TA-5142

HINTERGRUND

As an example, chitosans with a low degree of acetylation, and, as a consequence, with a relatively high density of positive charges, are particularly interesting, for example, in form of nanoparticles for drug, gene or vaccine delivery. However, the degradation of such chitosans in the human body is very slow or inexistent, as humans do not possess chitosanases, i.e. enzymes that cleave the glycosidic linkage between two adjacent GlcN units. Thus, they are found to be hardly or even not approvable by the Food and Drug Administration (FDA) for medical purposes.

Humans do possess chitinases and lysozyme, i.e. enzymes that hydrolyse the chitosan polymer chain within a stretch of two or three adjacent GlcNAc residues, respectively. But as conventional chitosans are characterised by random patterns of acetylation, such acetylated stretches which could serve as cleavage sites are rare.

LÖSUNG

The present invention relates to a process for the preparation of a non-random chitosan polymer, derived by using a deacetylase enzyme in the presence of acetate ions under conditions that allow acetylation of the poly-D-glucosamine by said chitin deacetylase to obtain a chitosan polymer which presents a defined, e.g. blockwise or more regular pattern of acetylation so that e.g. even chitosans with low degree of acetylation are more easily degraded by human enzymes or other advantages can be created compared to chitosans with undefined acetylation patterns.



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ENTWICKLUNGSSTAND

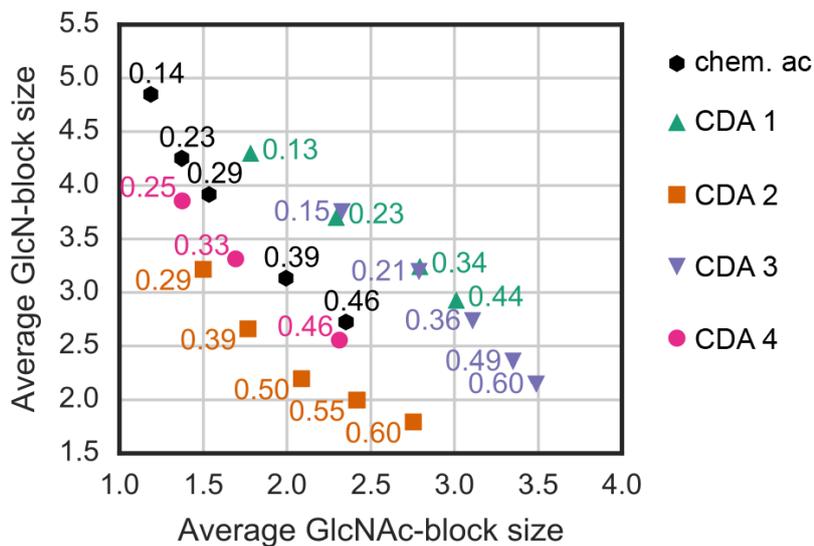
Funktionsnachweis

PATENTSITUATION

DE anhängig

CATEGORIES

//Life Sciences //Medizin und
Pharma //Therapie und
Wirkstoffe //Chemie //Polymerchemie



VORTEILE

- Defined pattern of acetylation
- Easily degradable in human tissues
- Increased biocompatibility and therefore, broad range of applications
- Likely better approvable by FDA or other authorities

SERVICE

PROvendis is offering licenses for the invention to interested companies on behalf of the University of Muenster.

PUBLIKATIONEN & VERWEISE

Kohlhoff M et al. (2017) Chitinase: A fungal chitosan hydrolyzing enzyme with a new and unusually specific cleavage pattern. Carbohydr. Polym. 174, 1121-8.

Hembach L et al. (2018): Enzymatic production of all fourteen partially acetylated chitosan tetramers using different chitin deacetylases acting in forward or reverse mode. Sci. Rep. 7, 17692.

