Clinic Invent

Technology Offer

Ref.-No. M11/14

Novel inhibitors targeting colonization and virulence of gastrointestinal pathogens

Introduction

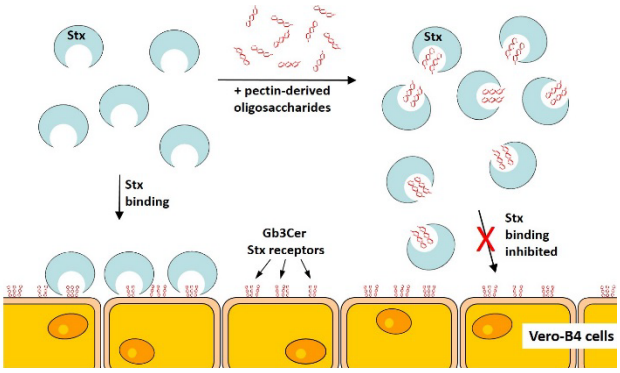
Diseases caused by toxin-producing pathogens are a worldwide health threat. Shiga Toxin (Stx)-producing *Escherichia coli* (STEC) and in particular human pathogenic enterohemorrhagic *E. coli* (EHEC) cause severe intestinal infections such as hemorrhagic colitis and life-endangering extraintestinal complications like the hemolytic-uremic syndrome (HUS). Stx, by definition a lectin with certain carbohydrate-binding specificity, belongs to the group of AB_5 toxins and represents the major virulence factor of EHEC. So far, no causal treatment of EHEC infections is available. The lack of causal therapy options became evident during large EHEC outbreaks in the past, which were caused by EHEC O157:H7 and O104:H4 serotypes.

Invention

We produced a number of pectic oligosaccharides (POS) and neoglycolipids (neoGLs) that have the potential to inhibit binding of Stx to its genuine receptors on the cell surface.

Besides treatment of EHEC-caused intestinal diseases and extraintestinal or systemic complications, UPEC (uropathogenic *E. coli*)-triggered urinary tract infections and the edema disease of pigs provide further clinical applications of the produced POS and neoGLs as well.

In addition, there are numerous other implementations to benefit from inhibitory effects of POS and POS-derivatives against toxins released by bacteria into the environment and for adhesin-bearing pathogens in numerous biological habitats. Such compounds might be useful for example as biological adsorbers of toxins or bacteria in filter systems for drinking water purification, swimming pools or spas, for municipal wastewater treatment and for detoxification of feces in slaughterhouses as well as for air filters of all kinds. Further applications are easily conceivable wherever bacteria-released toxins or adhesive pathogenic bacteria occur.



Binding of Stx to its receptor globotriaosylceramide (Gb3Cer) on the surface of target cells (left) and competitive binding of Stx to POS (right). POS-mediated blocking of Stx reduces the degree of cell killing.

Patent situation

PCT application filed.

Advantages of the invention

- low price of the raw material
- available virtually in unlimited amounts
- nonhazardous for humans and animals
- high "consumer acceptance"

For further detailed information please contact:

Clinic Invent

Dr. Marion Willenborg
Albert-Schweitzer-Campus 1,
Building D3
D-48149 Muenster, Germany

Tel. +49-(0)251/ 83 58 904
Fax +49-(0)251/ 83 58 905

marion.willenborg@ukmuenster.de