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Instituto de Agroquímica y Tecnología de Alimentos

technology offer

Novel enzymes improve the efficiency of the production of prebiotic disaccharides

CSIC has developed new enzymes transgalactosidase and transfucosidase that improve the efficiency of the production of prebiotic disaccharides lacto-N-biose, galacto-N-biose and fucosil-alfa-1,3-N-acetilglucosamine.

Industrial partners interested in developing and exploiting this technology under a patent license, are sought.

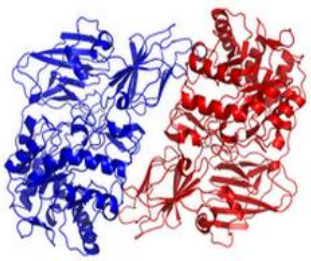
PREBIOTIC DISACCHARIDES AND THEIR INDUSTRIAL PRODUCTION

Prebiotics are compounds that modify the composition of the gut microbiota, improve health and are widely used as ingredients in functional foods.

Human milk contains oligosaccharides implicated in a great variety of biological processes and some of them exert prebiotic, antitoxic and antipathogenic actions against bacteria, viruses and parasites. Three of these disaccharides lacto-N-biose (LNB), galacto-N-biose (GNB) and fucosil-alfa-1,3-N-acetilglucosamine (3'FucGlcNAc) are prebiotics for the beneficial bacteria *Bifidobacterium* and *Lactobacillus* in children and adults. Additionally, LNB, GNB and 3'FucGlcNAc are compounds of great industrial interest since they are employed as substrate for the production of different kinds of bioactive molecules.

At present, LNB, GNB and 3'FucGlcNAc are industrially produced by chemical synthesis by poorly efficient methods resulting in long and costly processes.

CSIC has obtained an enzyme transgalactosidase, and an enzyme transfucosidase, that improve the efficiency of the production of prebiotic disaccharides lacto-N-biose, galacto-N-biose and 3'FucGlcNAc.



Tridimensional structure
enzyme beta-D-galactosidase

MAIN INNOVATIONS AND ADVANTAGES

- The developed enzyme transgalactosidase improves the efficiency of the LNB and GNB synthesis in transgalactosylation reactions.
- The developed enzyme transfucosidase improves the efficiency of the 3'FucGlcNAc synthesis in transfucosylation reactions.
- The enzymes use an inexpensive starting material as substrate.
- The enzymes characteristics favor the stability of the generated compounds increasing efficiency and yield of the processes.
- The improvement in production efficiency and cost reduction by employing these enzymes would allow for LNB, GNB and 3'FucGlcNAc to be used as functional ingredients.

PATENT STATUS

Priority patent application

FURTHER INFORMATION

KNOWLEDGE TRANSFER UNIT
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