Structural Analysis of EPS from *Pedioccocus parvulus* by NMR and molecular modeling

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A number of exopolysaccharides of β-glucan type play an important role in the rheology and texture of fermented foods and have also shown prebiotic properties. In addition, the (1→3)-β-D-glucans can promote antitumor and antimicrobial activity, by activating macrophages, other white blood cells or dendritic cells.

It has been shown that the lactic acid bacteria *Pedioccocus parvulus* 2.6 synthesizes an extracellular exopolisaccharide with thickening properties, that has been characterized as a linear β (1-3) homopolymer of D-glucose substituted every two glucose residues by another β-glucose unit on the 2 position[1]:

→3)-β-D-Glc*p*-(1→3)-β-D-Glc*p*-(1→
2
↑
1
β-D-Glc*p*

The NMR characterization and assignment[1] of this β-glucan and its rheological properties[2] have been previously analysed.

This exopolisaccharide has been produced and secreted (300 mg L^{-1}) by an uncapsulated recombinant *Lactococcus lactis* strain. This bacteria expresses the *P. parvulus* glycosyltranferase responsible for the β-glucan biosynthesis[3].

We are now studying, by NMR and molecular modelling, the structure and conformation of this exopolysaccharide in water, in order to understand their physicochemical properties in structural terms.

[1] Dueñas-Chasco M.T.; Rodríguez-Carvajal M.A.; Tejero Mateo P.; Franco-Rodríguez G.; Espartero J.L.; Irastorza-Iribas A.; Gil-Serrano A.M., *Carbohydrate Research*, **1997**, 303, 453-458.

[2] Lambo-Fodje A.M.; Leeman M.; Wahlund K.-G.; Hyman M. Öste R.; Larsson H., *Carbohydrate Polymers*, **2007**, 68, 577-586.

[3] Werning M.L.; Corrales M.A.; Prieto A.; de Palencia P.F.; Navas J.; López P., *Applied and Environmental Microbiology*, **2008**, in press. **doi:10.1128/AEM.00463-08.**