

Differential proteome and cellular adhesion analyses of the probiotic bacterium *Lactobacillus acidophilus* NCFM grown on raffinose - an emerging prebiotic - DTU Orbit (08/11/2017)

Differential proteome and cellular adhesion analyses of the probiotic bacterium *Lactobacillus acidophilus* NCFM grown on raffinose - an emerging prebiotic

Whole cell and surface proteomes were analyzed together with adhesive properties of the probiotic bacterium *Lactobacillus acidophilus* NCFM (NCFM) grown on the emerging prebiotic raffinose, exemplifying a synbiotic. Adhesion of NCFM to mucin and intestinal HT-29 cells increased three-fold after culture with raffinose versus glucose, as also visualized by scanning electron microscopy. Comparative proteomics using 2D-DIGE showed 43 unique proteins to change in relative abundance in whole cell lysates from NCFM grown on raffinose compared to glucose. Furthermore, 14 unique proteins in 18 spots of the surface subproteome underwent changes identified by differential 2DE, including elongation factor G, thermostable pullulanase, and phosphate starvation inducible stress-related protein increasing in a range of +2.1 – +4.7 fold. By contrast five known moonlighting proteins decreased in relative abundance by up to –2.4 fold. Enzymes involved in raffinose catabolism were elevated in the whole cell proteome; α -galactosidase (+13.9 fold); sucrose phosphorylase (+5.4 fold) together with metabolic enzymes from the Leloir pathway for galactose utilization and the glycolysis; β -galactosidase (+5.7 fold); galactose (+2.9/+3.1 fold) and fructose (+2.8 fold) kinases. The insights at the molecular and cellular levels contributed to the understanding of the interplay of a synbiotic composed of NCFM and raffinose with the host.

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