Conclusions

Totally, we proposed a new viewpoint as pan-tissue analysis and implemented a pathway-based computational approach to detect the critical difference and common pathways in the responsive tissues during T2D progression, and also shown that the tissue-common pathways can especially serve as genetic warning signals for the T2D sub-states (e.g. complications).

IDDF2019-ABS-0224

SECRETOME MODULATION OF CACO2 CELL LINE INDUCED BY A MULTI-STRAIN PROBIOTIC

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Background

Probiotics are defined as live, non-pathogenic bacteria that confer health benefits beyond their nutritional value. Particularly VSL#3, a probiotic mix containing 4 strains of Lactobacilli (L. paracasei, L. plantarum, L. acidophilus and L. delbrueckii subsp. bulgaricus), 3 strains of Bifidobacteria (B. longum, B. infantis, B. breve) and Streptococcus thermophilus, has demonstrated efficacy in the management of diseases characterized by increased intestinal permeability. The aim of the present study was to study secreted bioactive factors in order to evaluate the mechanisms of action to enhance intestinal epithelia.

Methods

Two different lots of VSL#3 (Manufacturer: Nutrilinea Srl, Gallarate (VA) - Italy, lot #802097 and lot #802100) were used. Caco2 cell line were treated with a conditioning media (CM) prepared using 1g of probiotic formula grown in D-MEM cell culture medium (free of serum and antibiotics) at 37°C for 48 hours without shaking and in anaerobic conditions. Caco2 were treated with diluted CM at 1:10 and 1:25 for 24 and 48 hours. Media culture for each condition has been collected and analyzed by a deeper proteomics approach. Differential protein expression was evaluated by shotgun proteomics analysis based on nLC-HDMS E and carried out on Synapt G2-Si mass spectrometer.

Results

The analysis of supernatants from Caco2, treated with CM, showed the presence of bacteria strain-specific proteins. Human proteins synthesized from CaCo2 were also identified, such as caspase 1, IL8, HSP70, HSP70b, HSP90, HSP105. The productions were time- and dose-dependent. In CM diluted 1:10, probiotic-derived proteins have been shown to be more expressed at 24 hours. Human caspase 1, IL8, HSP 70, HSP 70b, HSP 90, HSP 105 were also found upregulated in Caco2 treated for 24 hours with CM diluted 1:10.

Conclusions

This is the first time where a probiotic secretome was explored. Analysis of secretome from Caco2, treated with CM, helped us to understand the mechanism by probiotics can enhance intestinal barrier: by strengthening the autophagy process, an arm of innate immunity, by overexpression of caspase 1, IL8 and HSP 70, and by HSPs dependent modulation of inflammation.