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Effects of probiotic *Lactobacillus plantarum* IMC 513 treatment in the genetic model of anorexia nervosa, the *anx/anx* mouse

Elizabeta Zaplatic[1], Natalia Garcia-Gonzalez[1], Vincent Millischer[2], Mariangela Pucci[1], Maria Magdalena Coman[3], Aldo Corsetti[1], Ida AK Nilsson[2], Claudio D'Addario[1]

[1] Faculty of Bioscience and Agro-Food and Environmental Technology, University of Teramo, Teramo, Italy, [2] Department of Molecular Medicine and Surgery, Karolinska Institutet, Stockholm, Sweden; Center for Molecular Medicine, Karolinska University Hospital, Stockholm, Sweden, [3] Synbiotec S.r.l., Camerino, Italy

Introduction

The *anx/anx* mouse is a spontaneous genetic model, in homozygosity leading to starvation, emaciation and premature death, thus resembling some of the core features of AN. Gut microbiota has emerged as a promising intervention target for AN. Our hypothesis is that gut microbiota dysbiosis in AN might lead to activation of microglia cells, altered colon inflammation markers as well as production of SCFAs, causing the starvation and emaciation of these mice.

Study design

- Dysbiosis of gut microbiota → Administration of *Lactobacillus plantarum* IMC 513 probiotic (SynBiotec S.r.l., Camerino, Italy) in the *anx/anx* model of anorexia nervosa
- Changes in the SCFA production and expression of inflammatory markers in the colon → SCFAs analysis in the serum and evaluation of inflammatory profile of probiotic treated and control *anx/anx* and wt mice
- Hypothalamic aberances in the *anx/anx* mouse → Immunohistochemical analysis of:
  - AGRP in Arc
  - IBA1 in Arc and MPO
- Paradoxical response to fasting and negative energy balance → Body weight measeurements of probiotic treated and control *anx/anx* and wt mice

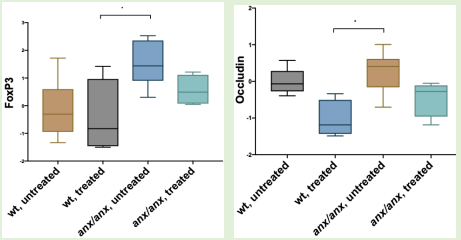
Conclusion

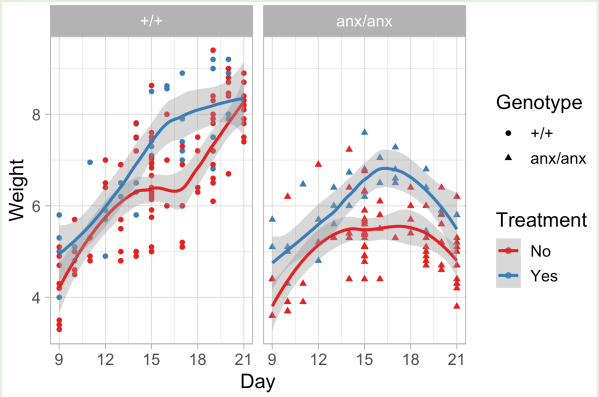
Preliminary results suggest beneficial effect of ***Lactobacillus plantarum*** **IMC 513** probiotic treatment in the *anx/anx* mouse as:

- ✓ **tendency of reduced body weight loss** during first three weeks of postnatal development
- ✓ **reverted expression of colon inflammatory markers**

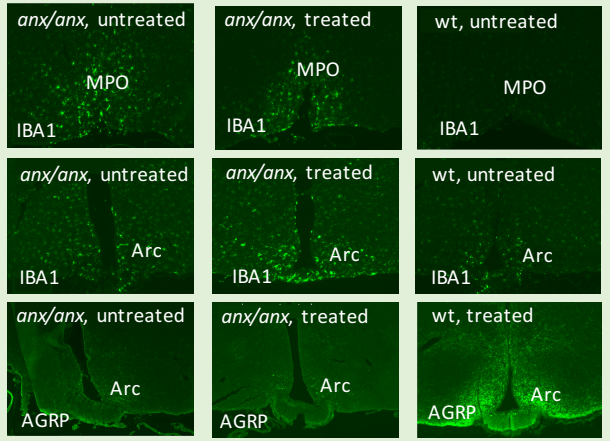
Results

Analysis of the gene expression in colon showed a slight reduction in *FoxP3* and *Ocl* mRNA levels after the probiotic consumption in both wt and *anx/anx* mice, thus could suggest a potential modulation of the inflammatory process.





Both wt and *anx/anx* probiotic treated animals showed tendency of the body weight increase during the postnatal development; however not enough to rescue the *anx/anx* mice of dying by the three weeks of age.



Probiotic treatment did not rescue molecular phenotypes of IBA1 and AGRP-immunoreactivity in the medial preoptic area (MPO) and arcuate nucleus (Arc) of the *anx/anx* animals