Epigenetic regulation of endocannabinoid system in Activity-based model of Anorexia nervosa

Elizabeta Zaplatic§, Mariangela Pucci§, Carlo Cifani§, Maria Scherma§, Paola Fadda§, Claudio D’Addario§

*Faculty of Bioscience and Technology for Food, Agriculture and Environment, University of Teramo; §University of Camerino; ¶University of Cagliari

**Introduction**

Anorexia nervosa (AN) is a psychiatric disorder characterized by a dramatic reduction in caloric intake by excessive dieting, which is accompanied by physiological, biochemical, and behavioral disturbances. Up to now, there is no proof of efficacy of any drugs [1, 2]. Animals housed with running wheels and subjected to daily food restriction show paradoxical reductions in food intake and increases in running wheel activity. This phenomenon, known as activity-based anorexia (ABA), leads to marked reductions in body weight and provides an important tool for investigating the neurobiological underpinnings of AN-like behaviour, which is of a great need given the reductions in quality of life, high mortality rate and lack of pharmacological treatment for AN [3].

**Activity-based Anorexia rat model**

Control: food ad libitum, no access to wheel

Restricted: food restriction 90 min/day, no access to wheel

Anorexic: food restriction 90 min/day, free access to wheel

**Methods**

- RNA and DNA extraction
- Isolated nucleic acids quality control
- Retrotanscription (cDNA synthesis)
- Quantitative real-time PCR
- Statistical analysis
- Bisulfite conversion of DNA
- PCR amplification of DNA
- Pyrosequencing
- Statistical analysis

**Reference**


**Results**

**Body weight**

Data on animal body weight, daily food intake and running wheel activity upon ABA induction in Control, Restricted, ABA and Exercise (not included in further analysis) group.

**Food intake**

**Daily RWA**

**Conclusions**

- We identified selective and time-dependent epigenetic modulation of CNR1 in ABA rats in selected relevant brain regions
- Our data support the role central role played by CNR1 in food intake
- It is of relevance the identification of gene transcription regulation at the beginning of anorexia development
- The study of epigenetic mechanisms might be of help to predict disease trajectories and choose effective therapies