

# 11<sup>TH</sup> EUROPEAN NUTRITION AND DIETETICS CONFERENCE

June 29-July 01, 2017 Madrid, Spain

## Eating habits combined with nicotinamide treatment modulate the cognitive function and cell metabolism in Wistar rat model

Melitta Pajk, K Felszeghy and Zs. Radák  
University of Physical Education, Hungary

**Introduction:** Sirtuin proteins are member of histone deacetylases. Sirtuins play an important role in aging and different kind of diseases, because sirtuins control cellular metabolism, antioxidant and oxidative damage repairing systems. Caloric restriction (CR) can modulate the content and activity of the sirtuin enzyme family which was related to CR's associating with multiform mechanisms, which includes longevity, mitochondrial biogenesis, oxidative stress and disease prevention.

**Methods:** In our study, we worked with 28 (14 month old) male Wistar rats. The animals were divided into four groups (n=7): control (C), caloric-restriction (CR), nicotinamide treated (N) and caloric- restriction combined with nicotinamide treatment (CRN). Nicotinamide was placed in the drinking water for treatment during every second day. We used 1% nicotinamide dilution for 4 weeks, then we decreased for 0.5%, because 1% caused significant loss of body mass. Every second day the whole nourishment was deprived in the caloric restriction groups. We measured the drink intake and food intake on every second day. We used the open field test and novel object test. These tests were used to assess behaviour and cognitive function. The quantitative analysis of proteins were carried out by Western blotting, the mRNS levels were assessed by PCR, and the activity level of proteins by spectrophotometry.

**Results & Discussion:** The protein content of SIRT1 decreased significantly in NAM and complex groups compared to control levels. NAM treatment alone and with caloric restriction significantly decreased the levels of 5'AMP-activated protein kinase (AMPK) compared to control groups. The FOXO-1 is a negative regulator of mitochondrial oxidative processes. Our data shows that the protein content of FOXO1 increased significantly in CR, NAM and complex groups compared to control levels. NAM treatment and caloric restriction significantly reduced the body mass of the animals. Both of factors, influenced the animals' cognitive functions. Novel object test shows that the animals which got combined treatments were more active, however their memory made more error. This data associated the open field test's results, because the CRN animals' level of crossings, duration, exploration were significantly highest compared to control levels. Our findings so far suggest that NAM and CR treatments caused weight loss, which can influence the alteration of cellular metabolism regulating proteins like AMPK, PGC-1 alpha. Beyond these facts eating habits and nicotinamide treatment play a major role not only in healthy lifestyle but can influence the cognitive functions too.

### Biography

Melitta Pajk is working as PhD student at University of Physical Education in Budapest, Hungary. She received her bachelor's degree programme in Nursing and Patient Care and her professional qualification of Physiotherapist at University of Miskolc, Hungary. Then she received her master's degree programme in Human Kinesiology at Semmelweis University, Hungary. She does her PhD at the University of Physical Education, Hungary on the topic of "Physical Training, Regulation, Metabolism".

pajk.melitta@tf.hu

### Notes: