

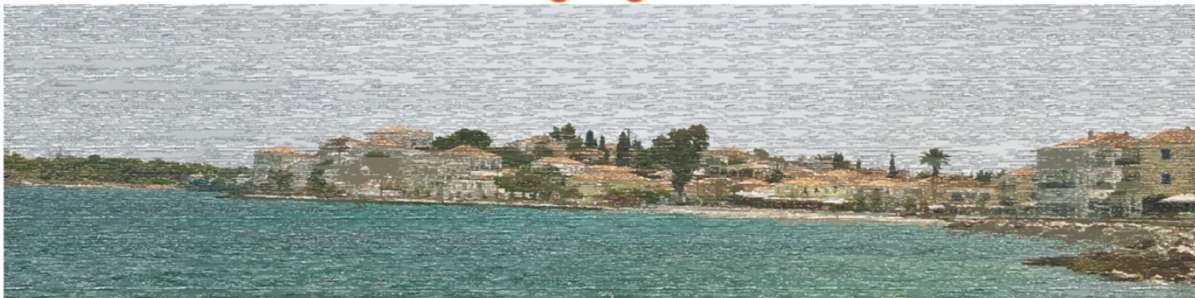
# Book of Abstracts



## Joint IUBMB/FEBS Advanced Lecture Course



**Molecular targets for anti-aging interventions**  
**26 Sept. – 01 Oct. 2022. Spetses Island, Greece**



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## SCIENTIFIC COMMITTEE:

Dr Aleksandra Mladenovic

Dr Efstathios Gonos

Dr Silva Katusic

Dr Alexandra Newton (IUBMB)

Dr Beata Vertessy

Dr Selma Kanazir

Dr Smilja Todorovic

Dr Marianna Kapetanou

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Dr Marianna Kapetanou

## SECRETARIES:

Dr Smilja Todorovic

Dr Marianna Kapetanou

# Dietary restriction as an antiaging intervention

S. Todorovic<sup>1</sup>, M. Prvulovic<sup>1</sup>, D. Milanovic<sup>1</sup>, S. Sokanovic<sup>1</sup>, A. Vukojevic<sup>1</sup>, V. Simeunovic<sup>1</sup>, S. Kanazir<sup>1</sup>, **A. Mladenovic<sup>1</sup>**

<sup>1</sup>Institute for Biological Research "Siniša Stankovic" - National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

Dietary restriction (DR) is the oldest and the most investigated anti-aging intervention. Since the famous McCay's study that showed that the restriction of calories without malnutrition prolongs mean and maximal lifespan in rats, thousands of papers demonstrated numerous beneficial effects of DR. DR is most famous for its proven capability to prolong life span, but what we know today is that DR prevents age-related diabetes, it decreases both incidence and progression of the different forms of cancer, protects from cardiovascular diseases, delays osteoporosis and sarcopenia. Its effects on the nervous system include preserved cognition, delayed brain atrophy, and protection from various neurodegenerative diseases.

By applying long-term dietary restrictions from the adulthood of male and female Wistar rats we demonstrated several beneficial outcomes. DR increased the level of synaptic plasticity markers and neurotrophic factors in the rat cortex and hippocampus and preserved brain cholesterol homeostasis during aging. It also suppressed apoptotic cell deaths after cortical injury and restored age-related impaired glucocorticoid receptor (GR) signalling in the brain. DR changed the expression of genes involved in AD pathology and suppressed microglial activation following cortical injury. However, recently we have been shown that the outcome of DR is highly dependent on the onset and duration. Namely, we demonstrated that short-term DR with a late-onset could have unfavorable effects on cognitive performances, anxiety level, and frailty in Wistar rats. In addition, DR could have a negative impact when introduced to transgenic AD animals. The results of our studies impose great caution when introducing CR to humans. To achieve its favorable effect DR should be introduced in humans up to the middle age.