

Vilniaus universitetas  
Medicinos fakultetas



# STUDENTŲ MOKSLINĖS VEIKLOS TINKLO LXXVI KONFERENCIJA



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Leidinį sudarė

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## EXPOSING THE EFFECTS OF MODERATE AEROBIC EXERCISE ON MYOKINES LEVELS

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**Supervisor.** Prof. dr. Vaiva HENDRIXSON, VU MF Institute of Biomedical Sciences, Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine.

**Background and aim.** The objective of this research is to examine the changes in concentrations of two myokines: Brain-Derived Neurotrophic Factor (BDNF) levels measured before moderate exercise and Irisin levels 24 hours after moderate exercise. The molecular mechanism of myokines and inter-organ communication in relation to physical activity is still not well understood, and it is unclear which myokines participate in homeostasis and how their expression and interaction occur depending on physical activity. The aim of this study was therefore to explore the interconnections between these myokines and the physiological responses induced by moderate aerobic exercise. Investigating the link between BDNF, Irisin, and exercise has the potential to offer valuable insights for the development of specific interventions aimed at improving brain function and metabolic health through exercise.

**Materials and methods.** Anthropometric measurements were conducted using an ACCUNIQ BC300 scale. This study involved 15 volunteers who followed protocols approved by the Vilnius Regional Bioethics Committee (approval number 2021/11–1393–866), with each participant providing written informed consent. Volunteers were taking part in two training sessions: 25 minutes of aerobic exercise and 25 minutes of high-intensity interval training (HIIT) on a SPARTAN Sports Magnetic 400 bicycle ergometer, with each session including exercises of different intensities. All measurements were meticulously documented. Blood samples were taken via standardized venipuncture before training, 60 minutes post-training, and 24 hours post-training to assess cytokine levels. These samples were allowed to clot, then centrifuged, and the resulting supernatant stored at -80°C until analysis. Laboratory analyses were conducted at the research laboratory of the Centre for Laboratory Medicine of VUL Santaros Klinikos using ELISA detection kits from Elabscience and a Thermo Scientific™ Multiskan SkyHigh Microplate Spectrophotometer for readings.

**Results.** A total of 15 participants (n=15) with an average age of 25.467 years and an average BMI of 23.993 were included in this study. The subjective self-assessment of health values resulted in a mean value of 8.133, which indicates that the participants were in good health overall. Before 25 minutes of moderate aerobic exercise, the average BDNF level was 15.763 ng/ml. Similarly, the average irisin level in samples taken 24 hours after moderate aerobic exercise was 145.19 ng/ml. A Wilcoxon signed–

rank test revealed significance between BDNF levels and Irisin levels after 24 hours ( $p$ -value = 0.006714). However, it should be noted that statistical significance does not necessarily imply clinical relevance, and further research is needed to understand the implications of this result.

**Conclusions.** The present study shows a significant relation of two myokines, brain-derived neurotrophic factor (BDNF) and irisin, before and after moderate aerobic exercise. These findings suggest that moderate aerobic exercise may have a positive effect on neurotrophic factors and metabolic adaptations.

**Keywords.** Cytokines; Irisin; BDNF; Exercise; Myokines.