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Fund “Nauka” Project № 19034 Resume – Competition-Based Session 2019:

“Plasma levels and expression of leptin and adiponectin to evaluate their applicability as molecular biomarkers in colorectal cancer”

Project leader: Prof. Yoana Dimitrova Kiselova-Kaneva, PhD

Colorectal cancer (CRC) is thought to be the second leading malignant disease in developed countries and accounts for nearly a quarter of all cancer cases. Similar is the statistics for Bulgaria, with the CRC being the third most reported cancer according to the latest data from the National Cancer Registry. CRC is defined as a disease of public concern and due to the fact that it affects and causes high mortality of people of working age.

It turns out that despite the high current level of medical development, there are still unresolved problems with this malignancy – poor treatment success, high recurrence rates, lack of clear prognostic criteria determining surgical and therapeutic behavior, etc.

With the discovery of leptin and adiponectin, studies on the relationship between obesity and CRC have begun to generate data suggesting an association between adipose tissue dysfunction, adipokine misregulation, and initiation and progression of CRC. Such searches are justified, as these molecules are involved in regulating cell growth and proliferation, as well as in tumor angiogenesis.

The study is expected to increase scientific knowledge, with a comprehensive study of plasma levels of leptin and adiponectin and mRNA levels of leptin and adiponectin in plasma and tumor tissue for the first time. The results will be linked to clinical-pathological parameters. Research in this direction will answer the question of whether these molecules have the potential to be used as biomarkers in the prevention, staging, diagnosis, treatment determination and prognosis of CRC. The results obtained and the conclusions drawn from this project proposal would help in the selection of molecular markers at different levels of disease control.

The project is being implemented in collaboration between the Department of Biochemistry, Molecular Medicine and Nutrigenomics, the Department of General and Operative Surgery and the Department of General and Clinical Pathology at MU – Varna.

Obtained results:

Leptin and adiponectin and mRNA levels in plasma of CRC patients were investigated compared to healthy volunteers. The gene expression level of leptin and adiponectin in tumor tissue in CRC patients was measured. Statistically significant differences were found between the study groups, as well as dependence on body mass index and gender. Plasma leptin levels

as well as the leptin/ adiponectin ratio are markers with good diagnostic potential and can distinguish between CRC and controls.