

**Effect of egg's yolk fatty acids enriched in conjugated linoleic acids (CLA)
on apoptosis- an investigation of pro-apoptotic mechanisms of CLA on selected cancer cell
lines**

Conjugated linoleic acid (CLA) constitutes a family of many isomers of linoleic acid (*cis9,cis12* C18:2), in which two double bonds are divided by one single bond due to isomerization. CLA is a biologically active compound with a proven antitumor properties. The mechanisms of its action on the cell still being investigated. Existing basic research shows that the highest biological activity is exhibited by two isomers of CLA: *cis9,trans10-CLA* (80-90% CLA in food) and *trans10,cis12-CLA* (3-5% CLA in food), however the impact of those compounds on cells is different, and even these compounds often have the opposite effect. In the literature there are only few reports about the effects of fatty acids containing CLA incorporated into the feed to the product (egg yolk) on prostate cancer, lung cancer and melanoma cells, and the lack of information about potential pro-apoptotic mechanisms, by which these isomers may reduce viability of cancer cells.

The reason for taking this research subject is to understanding and explanation mechanisms responsible for the decrease in proliferation level and apoptosis of cancer cells, by the action of conjugated linoleic acid derived from food products.

The study of the molecular mechanisms responsible for proliferation and apoptosis, on gene expression level, will be obtained using RealTime PCR method. To further increase the sensitivity and precision of analysis, the molecular probe based on TaqMan technology will be used.

The method of Western Blot will be used to study the apoptotic pathways on the protein level and to identify proteins involved in this process. Using protein arrays and selected monoclonal antibody will observe subtle changes in the analysed protein such as phosphorylation or cut off or adding fragment of protein.

Notable effects of the project will be approximation the molecular mechanisms action of CLA isomers as a proapoptotic factor with the determination of apoptosis signaling pathways. The project will enables to evaluate the possibility of the use of hen egg as a nutraceutical in the prevention of cancer.