

Research carried out over past 20 years has shown that the diet is essential factor influencing the risk of development of civilisation diseases such as cardiovascular disease, type 2 diabetes, certain types of cancer, and it often lies at the basis of obesity. On the other hand, the increasing knowledge of the chemopreventive properties of certain food ingredients, in particular those of plant origin, made it possible to use edible plants in the prevention of chronic diseases. Health promoting properties of these foods are associated with the presence of secondary metabolites that can affect many important biological mechanisms of critical importance to proper functioning of the human organism. The results of numerous investigations indicated a strong physiological effects of bioactive plant phenols belonging to the flavonoid family. These observations caused mass production of dietary supplements containing substances commercialized under the name antioxidants even if their chemical properties did not justify such a term.

However, it turned out in epidemiological studies that isolated bioactive phytochemicals are not as effective as fruits and vegetables containing these substances. This may mean that the plant metabolome may affect health promoting properties of plant secondary metabolites, but in scientific literature it is difficult to find a systematic research aimed at elucidation of this problem.

The aim of the project is to compare the chemopreventive potential of different varieties of edible fruits that contain phytochemicals with documented health-promoting properties and purified commercially available standard anthocyanins solutions.

For this research there were selected, pairs of fruits belonging to the same species, but with different content of anthocyanins, which are compounds with documented high biological potential. The following pairs of fruits will be used: yellow and red raspberries, white and red grapes, white and black mulberries, white, red and black currants and yellow and red mirabelle plums. These selected fruits either contain or are devoid of components belonging to the mentioned group of secondary metabolites. The assessment of properties important for health benefits for the mentioned pairs of fruits should reveal the anthocyanin chemopreventive potential in the context of food matrix. To evaluate chemopreventive potential of the pairs of fruits selected for the study, and that of standard solutions, the following parameters will be tested: quantitative and qualitative composition of biologically active compounds, antioxidant activity and biological activity towards cancer cells.

Based on the results of these studies and comparisons with the available literature data for the isolated substances, it will become possible to reason if and to what extent the metabolome determines the effect of the selected phytochemicals found in plants studied on human health. This is very important information to rationally formulate dietary recommendations. Such a knowledge is also of practical utilization in the design of functional foods and dietary supplements whose growing popularity among consumers is observed.