

Effects of anthocyanin-rich grain diet on growth and metastasis of Lewis lung carcinoma in mice

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Currently functional nutrition has developed intensively. Functional foods are a valuable addition to existing dietary therapy. Such products are enriched with biologically active substances. Anthocyanins attract particular attention due to multiple beneficial properties including antitumor activity. Here we used two wheat near-isogenic lines created at the Institute of Cytology and Genetics SB RAS [1] that have almost similar genomes with the exception of a small part of chromosome 2A, which contains the Pp3/TaMyc1 gene regulating anthocyanin biosynthesis, to assess the effect of an anthocyanin-rich grain diet on the development and metastasis of the Lewis lung carcinoma

(LLC), as well as the accompanying immune response in C57BL/6 mice. Mice were kept at a grain or standard diet for four month prior tumor transplantation. A decrease in the number of metastases in the lungs and the size of the tumor in the groups at a grain diet, regardless of the content of anthocyanins, was revealed. However, the highest percentage of animals without metastases was observed at an anthocyanin-rich grain diet. The LLC transplantation caused a significant increase in plasma levels of pro-inflammatory cytokines (IL-6 and LIF) in mice at a standard diet, but not in animals at grain diets. Thus, the anthocyanin-rich diet helps to reduce the severity of the tumor process. The antitumor effects of grain diets are probably mediated by modulation of signaling pathways associated with IL-6 cytokines.

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REFERENCES

- [1] E. I. Gordeeva, O. Y. Shoeva, and E. K. Khlestkina, “Marker-assisted development of bread wheat near-isogenic lines carrying various combinations of purple pericarp (*Pp*) alleles,” *Euphytica*, vol. 203, pp. 469–476, 2015.