

Selenium plays an important role in cancer prevention and treatment. Selenoproteins, mainly thioredoxin reductase and glutathion peroxidase, are involved in the antioxidative defense system. Sodium selenite in physiologic concentrations blocks apoptosis. Selenomethionin takes part in DNA repair and protects cells from DNA damage. Selenium toxicity is used for cancer treatment. Sodium selenite in high concentrations induces apoptosis in tumor cells and also causes DNA damage. Selenomethionin and sodium selenite in high concentrations inhibit metastasis due to regulation of gene expression for collagen. Selenium inhibits angiogenesis, because it decreases vesicular endothelial growth factor (VEGF) amount in tumor cells. Thioredoxin reductase protects normal as well as tumor cells. Inhibitors of its activity are used for cancer treatment. Clinical trials established, that low selenium intake increases the risk of cancer.