Abstract

Prostate cancer is one of the major medical problems within the male population in the Czech Republic and in the world. It is on second place among cancer illnesses with respect to mortality in czech male population. Its incidence strongly increases with age.

Prostate cells have a unique ability to accumulate zinc in high concentrations compared to other tissues of human body. It is necessary for the proper physiological function of the prostate. There was detected loss of this accumulation ability in prostate cancer cells, which seems to be a condition to carcinogenesis in prostate cells.

In this thesis was investigated the expression of four genes involved in the maintenance of homeostasis of zinc in prostate cells. Genes ZIP1 and ZIP7 encode zinc transporters, genes MT1-F and MT2 encode metallothioneins.

There was collected 90 biopsy specimens from patients with prostate cancer or with benign prostatic hyperplasia. mRNA was isolated from these samples, cDNA was obtained by RT-PCR. This cDNA was detected by gel electrophoresis and the results were statistically evaluated.

Several correlations was found between gene expression and the clinical data of patients. The most important result, there was found lower levels of expression of genes MT1-F and ZIP1 in samples of patients with cancer compared to patients with hyperplasia. Thus these genes may act as tumor suppressor genes in prostate cells.