This thesis deals with the role of growth factors in the pathogenesis of thyroid gland tumors. There exist a lot of studies describing growth factors production or occurrence directly in the thyroid tissue. The aim of this thesis was to find possible differences in serum concentrations of growth factors in patients with thyroid adenoma and papillary cancer and in healthy people. The finding of suitable peripheral marker could be used in thyroid tumors diagnosis in the future. There was also detected growth factors production by normal thyroid gland and papillary thyroid cancer in a dynamic model of flow tissue culture, under the influence of stimulating substances. The aim was a more detailed understanding of particular growth factors role in a process of thyroid oncogenesis.

Growth factors are polypeptides, proteins and glycoproteins with an informative and regulatory function. They have mainly local effects in tissues - autocrine and paracrine. They form an extensive cytokine network in the organism, with complicated synergic and antagonistic linkages. They are not specific for concrete cells, tissues or pathological processes. Many growth factors are products of oncogenes and take part in a process of tumors origin and growth.

The most frequently refered growth factors related to thyroid gland tumors are IGF-I (Insuline-Like Growth Factor I), bFGF (basic Fibroblast Growth Factor), TGFpl (Transforming Growth Factor pi), HGF (Hepatocyte Growth Factor) and VEGF (Vascular Endothelial Growth Factor). All of these cytokines, except of IGF-I, have dedifferentiating effects on thyrocytes and they are also strong mitogens (except of TGFpi and VEGF). In addition, VEGF and bFGF are important activators of angiogenesis.

In this thesis, there were detected peripheral serum concentrations of IGF-I, bFGF, TGFpl, HGF and VEGF in patients with thyroid adenoma and papillary cancer and compared with those in healthy people. There was also examined the production of bFGF and HGF by papillary thyroid cancer and normal thyroid gland in a model of flow tissue culture, after the stimulation by TSH (thyrotropin) and EGF (Epidermal Growth Factor).

There was found, that growth factors serum concentrations are not in accordance at all times with literary data about their occurrence in thyroid glang tissue. Significantly higher serum levels of HGF and bFGF in patients with thyroid adenoma and papillary cancer lead to a hypothesis, that these two growth factors could be sensitive (but not specific) markers of papillary thyroid cancer.

Experiments in tissue culture showed the HGF part in the maintaining of papillary thyroid cancer malignant potential. Nevertheless, HGF probably does not initiate the malignant transformation of thyroid follicular cells. Increased bFGF production can be induced by higher metabolic requirements of thyroid tissue; it ensures the sufficient vascularization. The inhibition of HGF and/or bFGF effects could lead to the stop of benign and malignant goitre growth.