Abstract

Chronic inflammation caused by many initiators can lead to a development of a tumor disease. Among these initiators, we found chronic infections as well as other biological, chemical or physical factors which have endogenous and exogenous origins as for example tobacco smoke, alcohol, radiation, obesity and others. The inflammatory response is orchestrated by immune system cells which contribute to a tumorigenesis by producing reactive oxygen and nitrogen species which harm cell structures, and by releasing cytokines – important mediators of inflammation – which increase cell proliferation and angiogenesis. But apart from higher risk of tumourigenesis due to chronic inflammation, the immune system cells also participate in tumor microenvironment formation. The main contributors are tumor associated macrophages, dendritic cells and T-cells. Besides other things, the complex tumor microenvironment is characterized by the presence of many inflammation mediators which assist in malignant cell proliferation, tumour progression and metastasis and angiogenesis. This bachelor thesis describes the key protumor and antitumor factors which are also involved in the inflammation process. These factors include proinflammatory cytokines, enzymes and transcription factors. The transcription factor NF-κB plays an important role in the inflammatory response. It acts on lots of genes causing activation of further signal pathways and its role in tumorigenesis is very complex as well. Right and deep understanding of the role of the inflammatory cells in the tumor development and in the tumor supporting microenvironment formation on the molecular level is important for identification of suitable therapeutic targets in the prevention of chronic inflammation but also in the treatment of developed tumors.

(In Czech)

Key words: tumor, inflammation, immune system, leukocytes, microenvironment, cytokines, chemokines, NF-κB, TNF, TGF-β, interleukins, MIF, COX-2, iNOS, STAT3, HIF-1α