

Abstract

STAT3 (Signal Transducer and Activator of Transcription 3) is considered to be one of the possible targets of cancer treatment. The ability of STAT3 constitutive activation to form tumors is a foundation of such theories. Additionally, constitutively activated STAT3 is present in many types of cancer with high occurrence, such as breast and prostate carcinoma. This protein is required in normal body cells as well. STAT3 is a transcription factor targeting many genes that are essential for the cell. STAT3 is activated by phosphorylation of its tyrosine residue and homodimerization. Proteins transcribed with help of STAT3 function in cell cycle progression, cell growth, replication, negative regulation of apoptosis, and other roles, typical for cancer. Moreover, STAT3 is modulating mitochondrial function and maintaining ROS production in mitochondria, but in form of transcriptionally inactive monomers. The purpose of this Thesis is to review known data about STAT3 in oncogenesis and by that, to show STAT3 has great potential to become the target of cancer treatment. This Thesis contains a short overview of known STAT3 inhibitors as well.

Key words:

Signal Transducer and Activator of Transcription 3 (STAT3), JAK/STAT3 pathway, constitutive activation, cancer, tumor, inhibitor, mitochondria, apoptosis