

Abstract

STAT3, one of the seven members of STAT protein family, is able to transduce signal into the nucleus, where it binds to specific DNA sequences and acts as a transcription factor. Under physiological conditions, STAT3 regulates genes associated with number of functions such as cell proliferation, differentiation, apoptosis or immune response. In the case of pathological conditions, STAT3 can be dysregulated or constitutively activated, which may result in cancerogenesis. During this process, STAT3 is frequently activated directly in tumor cells where it acts tumorigenically. STAT3 is also associated with inflammatory reactions mediated by immune cells, which along with tumor and stromal cells are involved in the formation of the tumor microenvironment. The role of STAT3 is also important in the fight against viral infections, and when STAT3 activated aberrantly, it can lead to chronic diseases, including cancer. Due to these serious roles during pathogenesis, STAT3 is the subject of research of various inhibitors that either directly inhibit the STAT3 molecule function or indirectly any of the components of its signaling pathway.