

Oligonucleotide Compositions for the inhibition of Transcription Factors

Background

The STAT (signal transducers and activators of transcription) family of transcription factors is involved in the signal transduction pathway of growth factors and cytokines. STAT1, STAT2, STAT3, STAT4, STAT5 and STAT6 are some of the known members of STATs. STATs are activated by phosphorylation of tyrosine and serine residues. Phosphorylation of STAT3 is via IL-6 signaling and is tightly regulated in normal cells. However, aberrant signaling of STAT3 is found in many types of malignancies such as head and neck cancer, breast cancer and prostate cancer. The persistent activation of STAT3 leads to over-expression of genes involved in antiapoptotic factors and cellular proliferation. However, inhibition of STAT3 leads to the apoptosis of malignant cells. Thus, inhibition of STAT family of transcription factors represents a new strategy for the treatment of diseases wherein the aberrant expression of transcription factors plays a critical role in the progression of diseases such as cancer, autoimmune diseases, and chronic inflammatory diseases.

The present invention provides oligonucleotide compositions for the treatment of diseases wherein aberrant STAT transcription factor expression plays a critical role in pathophysiology.

Description of the Technology

Oligonucleotide compounds containing sequences capable of binding to transcription factors and inhibiting activity of transcription factors have been shown to modulate cellular responses mediated by STAT family of transcription factors. In the presence of excess amounts of the binding sequences, STAT transcription factors were prevented from binding to genes. Further, human prostate cancer cells transfected with these oligonucleotide binding sequences were apoptotic as compared to cells transfected with irrelevant sequences.

These oligonucleotide binding sequences were tested for their ability to inhibit tumor growth in an *in vivo* mouse model for human prostate cancer. Mice injected with these oligonucleotides had significantly smaller tumors compared to control mice. Taken together, these data support the use of these oligonucleotides in the treatment of diseases wherein STAT transcription have a pathophysiological role.

Applications

For the treatment of diseases wherein STAT family of transcription factors have a pathophysiological role. Specific applications include: Cancer, Autoimmune diseases, Chronic inflammatory diseases, Alopecia, cosmetic hair removal or suppression

Patent Status

- United State provisional patent application filed. (Application No.: 10/960,555)

Licensing Opportunity

- This technology is available for exclusive license.

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