Researchers at the University of South Florida have developed a method to inhibit activities of signal transducers and activator of transcription (STAT).

Transcription factors function by binding to DNA in specific regions that are usually upstream from the coding region of a gene and affect the transcription of that particular gene. STAT proteins are one family of transcription factors. Interference with these factors have laboratory and potential clinical application because specific disease causing genes can be regulated while other cellular responses can be altered including cell proliferation, apoptosis, differentiation and activation.

Studies have shown that STAT3 and STAT5 are constitutively activated in many human malignant cell types. Activated transcription factors are most critical in continuously dividing cells and during the process of cell division. This indicates a favorable therapeutic index because these cells will be most affected by therapy relative to normal cell populations with lower proliferative index.

Several molecules have been used for their inhibitory effect on STAT proteins including anti-sense oligonucleotides and ribozymes. However these molecules have non-specific effects on other unintended targets. The present invention uses double stranded oligonucleotides that contain consensus STAT5 or STAT3 binding sites, which competitively inhibit the ability of STAT to bind to its endogenous DNA targets.

This invention has therapeutic application in diseases in which transcription factors play a role including leukemias and other types of cancers.

**ADVANTAGES:**
- Specific for STAT molecules
- Anticipated low toxicity
- Application in multiple diseases

**STAT inhibitors for the Treatment of Leukemia**

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