Researchers at the University of South Florida have developed a novel use of an miRNA-142 to regulate the differentiation of a heterogeneous group of cells termed as myeloid derived suppressor cells (MDSCs).

Inflammation underlies the genesis of multiple human disease including cancer, cardiovascular, infectious and neurological conditions. It involves a well-orchestrated group of cytokines and cellular events from an acute to a chronic stage. Prolonged inflammatory conditions lead to accumulation of MDSC, which in elderly humans can lead to an immune suppressed states that are referred to an immune senescence.

It has been shown that overexpression of miRNA-142 in MDSCs is sufficient to differentiate them into antigen-presenting cells. Also, miRNA-142-overexpressing Tg mice lack MDSC expansion, suggesting that therapeutic overexpression of miRNA-142 can induce MDSC differentiation and correct defective immunity. It is then believed that therapeutic intervention to alter the differentiation of MDSCs can modulate chronic inflammation.

Our inventors have proposed a targeted delivery of miRNA-nanoparticles to MDSCs to redirect differentiation and alter immunity from ‘suppressor’ to ‘responder’ mode. This novel approach may be harnessed to develop novel therapeutics for chronic lung inflammation in the elderly.

**ADVANTAGES:**

- Overexpression of miRNA negatively regulates expansion and differentiation of MDSCs
- Enables host system to mount an effective immune response

**Novel Therapeutics for Chronic Lung Inflammation**

**Schematic of Proposed CLI Cascade**