Researchers at the University of South Florida have identified a novel target for RNAi treatment of inflammatory diseases, including asthma and RSV infection. This therapy demonstrates significant alleviation of inflammation in animal experiments and shows promise for clinical adaptation.

Much of the damage caused by diseases that induce inflammation are caused by the inflammatory process itself. By preventing progression of the inflammatory pathway, damage can be prevented, as well as many of the symptoms associated with these inflammatory diseases.

Our investigators have identified a novel target in the inflammatory pathway, the silencing of which decreases inflammation in animals challenged with agents that typically cause inflammation (see figure). siRNA is a double-stranded RNA fragment that has the capability to target a specific gene and eliminate expression of a protein encoded by that gene. Administered intranasally, this therapy avoids the difficulties of other siRNAs, which are degraded in the bloodstream. In addition, the siRNA is also complexed with a nanoparticle to improve its absorption into target cells — an improvement over existing siRNA therapies. This therapy can be applied to treat active disease or as prophylaxis.

**ADVANTAGES:**
- siRNA provides an efficient route of gene silencing to prevent inflammation
- Treat active disease or use as prophylaxis
- Intranasal administration and nanoparticle vehicle allow efficient absorption into target cells

**Novel siRNA target for treatment of asthma, RSV Infection, and other inflammatory disease**

siRNA targets and silences target gene in the inflammatory pathway. siNPRA9 (siRNA targeted to natriuretic peptide receptor A, bottom left) decreases inflammation in mice sensitized to, then challenged with ovalbumin. Mice without treatment and challenged with ovalbumin (OVA, top right) and naïve mice (top left) show increased inflammation. Silencing is achieved in a target-specific manner, as demonstrated by scrambled siRNA where no protection is seen (bottom right).

Tech ID # 06A040 Patent #: 8,071,560