

MicroRNA regulation of airway mucins for treatment of lung diseases

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INVENTION NOVELTY

This invention describes a novel therapeutic microRNA target regulating mucus production for the management of symptoms caused by a range of lung diseases, including asthma, chronic obstructive pulmonary disease (COPD), cystic fibrosis, and the common cold. Recently, a specific miRNA, along with its highly homologous family members, has been shown to be dysregulated in asthmatic subjects. To modulate the effect of these miRNAs, antagomirs (which target specific endogenous miRNAs and dampen their effect) or miRNA mimics can be administered via an inhaler, allowing for the regulation of mucus production. This invention is at the preclinical stage, and *in vivo* testing in a mouse model of asthma has shown that treatment with a specific miRNA antagomir results in a significant reduction of airway mucus production. While there are currently no effective therapies targeting mucus production in the airways, miRNAs are a promising new avenue for therapeutic intervention as they are fast-acting and reversible.

VALUE PROPOSITION

- ▶ Reduction of symptoms and clinically significant events in many lung diseases can be achieved by targeting airway mucus production
- ▶ Entire cellular pathways can be modified by targeting miRNAs
- ▶ Specific miRNAs can be targeted to either block or enhance their effects
- ▶ miRNA-mediated regulation is fast acting and reversible, especially compared to protein-based therapeutics
- ▶ miRNA targeting is cost effective due to the oligonucleotide composition of antagomirs and mimics

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

microRNA, Airway, Mucins,
Asthma, COPD, Cystic
Fibrosis, Common Cold,
Lung Disease

CATEGORIZED AS

- ▶ **Biotechnology**
- ▶ Health
- ▶ **Medical**
- ▶ Disease: Respiratory and Pulmonary System
- ▶ Therapeutics

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