Researchers at the University of South Florida have developed a novel method to limit downregulation of the beta2-adrenergic receptor, thereby providing a more effective treatment for asthma and chronic obstructive pulmonary disease (COPD).

Both asthma and COPD are commonly treated with beta-agonists. Beta-agonists are categorized into a specific class of medications which relax airway muscles, resulting in bronchodilation and increased airflow. However, over time the drug tends to lose its effectiveness. This is due to a downregulation pattern of the beta2-adrenergic receptors, because of a decrease in protein expression. This response is known as tachyphylaxis, and is a significant problem in the treatment of pulmonary disorders. Therefore, an effective therapeutic which can reduce this downregulation mechanism is necessary for the continued efficient management of asthma and COPD using beta-agonists.

USF researchers have developed a method to significantly limit beta2-adrenergic receptor downregulation. By inhibiting a specific transcription factor, the upregulation of various microRNA are also inhibited, which then limits the microRNA’s ability to downregulate the beta2-adrenergic receptors. When treated by the aforementioned method, a significant decrease was found in beta2-adrenergic receptor downregulation in cultured human airway smooth muscle (HASM) cells. This novel method may provide a means to maintain the effectiveness of beta-agonist based treatments for pulmonary disorders.

**ADVANTAGES:**
- Continued effectiveness of beta-agonists
- Reduced downregulation of beta2-adrenergic receptors

**A Novel Method to Limit Downregulation of the Beta2-Adrenergic Receptor**

**Depiction of the Inflamed Airways Which Occur During an Asthma Exacerbation**

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