

Novel Method for Applying Vasoactive Substances

Category

Medical Device / Drug Delivery

Problem

There is a clear unmet need for an alternative drug platform that can deliver hydrophobic drugs to the lungs.

Technology Overview

Method and composition for applying vasoactive substances to the lungs via a nebulizer and/or a metered dose inhaler.

Advantages

- ▶ Inhaled medications can be given in higher concentrations compared to oral drugs
- ▶ Inhaled medications have reduced side effect profiles compared to their oral counterparts
- ▶ This platform can be integrated into devices already widely adopted by patients and doctors alike.

IP Status

- ▶ Patent Pending/issued
- ▶ Available for Exclusive or Non-Exclusive Licensing

Contact

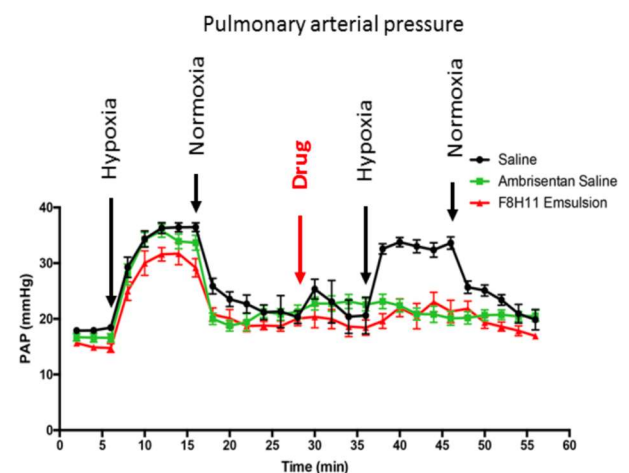
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Problem: Current routes of administrations for vasodilatory drugs pose several challenges that can impair the efficacy of the drug. Some of these include the first-pass effect, varying genetic makeup of patients, differing bio-availabilities in the lung, differing time to drug onset, and the need for a patient to take multiple doses throughout the day. One of the most concerning for patients is the off-target side effects of their medications. With oral dosages of antihypertensives, for example, since they enter into the systemic circulation, there is always a risk of side effects such as syncope, nausea, and vomiting. There is a clear unmet need for a drug delivery platform that is convenient for the patient and the provider. Overcoming the barrier of effective drug delivery can be achieved by increasing patient adherence to their medications by removing some of the issues stated above with oral dosages.

Technical Solution and Key Value Propositions: Researchers at the University of Colorado have developed a novel method for a stabilizing emulsion for hydrophobic drugs that allow for formulation into a metered-dose inhaler with propellant. This method has been proven in animal models to induce vessel dilation in the pulmonary resistance vessels when given via a fine mist via nebulizer.

Up until this study, it was currently unknown whether inhalable vasodilatory compounds could affect the lung vasculature due to the location of the lung being so far downstream of most of the arterial vasoactive elements. This drug delivery method could allow for the availability of a new treatment modalities to patients suffering from pulmonary hypertension that avoids many of the risks posed with oral dosages.



Advantages and Value Proposition- Large concentrations of the inhaled medication can reach the organ of interest while minimizing the risk of off-target side effects.¹ Oral, as well as injectable dosage forms, usually never reach the concentration levels of inhalable medications; this is due to the high risk of toxicity to the patient. Another benefit of this type of drug delivery platform is that the application of the drug can be made using multiple modes of administration that are already widely adopted in the medical sphere. These include a nebulization system as well as commercially available pressurized metered-dose inhalers.

Additional Documents and Sources:

“Compositions and Methods for Treating Pulmonary Hypertension.” Provisional patent application filed July 6, 2010; available under CDA.

Borghardt JM, Kloft C, Sharma A. Inhaled Therapy in Respiratory Disease: The Complex Interplay of Pulmonary Kinetic Processes. *Can Respir J*. 2018;2018:2732017.

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