Advanced Engineered Formulations of Rho/Rock Kinase Inhibitor (Fasudil) Microparticle/Nanoparticle Formulations for Inhalation Drug Delivery for Respiratory and Pulmonary Vascular Diseases and Applications Therein

Title: Advanced Engineered Formulations of Rho/ROCK Kinase Inhibitor (fasudil) Microparticle/Nanoparticle Formulations for Inhalation Drug Delivery for Respiratory and Pulmonary Vascular Diseases and Applications Therein

Invention: This technology is the reformulation of fasudil, a known pharmaceutical, into a dry powder form to facilitate non-invasive, aerosolized administration of the medication. This affords a localized, potent and increased availability of the drugs to the body. The intended purpose of this formulation is to treat pulmonary hypertension and other pulmonary vascular diseases.

Background: Pulmonary hypertension is a progressive disease that leads to increased intra-arterial pressure in the pulmonary vasculature leading to heart failure. Fasudil inhibits a pathway in the body that regulates vasoconstriction, allowing relaxation of blood vessels and reduction of blood pressure and increase of smooth blood flow. Delivering fasudil locally into the lungs can potentially avoid systemic hypotension as a side effect. Small particle formulations such as liquid or dry powder aerosols confer easy drug inhalation and delivery to the lungs and vascular system. These are biologically compatible and subsequently degrade within the body. This invention provides novel encapsulation of fasudil to effectively aerosolize and deliver treatment for pulmonary diseases.

Applications:

- Therapeutics for pulmonary hypertension
- Therapeutics for acute lung injury or acute respiratory distress syndrome

Advantages:
• Provides convenient access to vasculature through excipient aerosol formulations
• Allows for targeted treatment within lung vasculature by the formulated nano or micro particles
• Biodegradable
• Provides a novel therapeutic platform that is adaptable to other active drugs

Licensing Manager:
Lisa Lin
Lisal@tla.arizona.edu
(520) 626-6969

Inventors
Heidi Mansour
Assistant Professor, Pharmacy Practice and Science

Stephen Black
Professor, Medicine

Priyadarshini Muralidharan
Graduate Associate, Research, Pharmaceutical Sciences