

## Technology Offer

### Pentagalloyl-Glucose for improvement of impaired biomechanics in pulmonary arteries and prevention of pulmonary hypertension

Ref. No.: CH027/2021

#### Background

Around 1 % of the adult population suffers from pulmonary hypertension (PH), a symptom which is defined by increased blood pressure (> 25 mmHg) in the pulmonary artery and vascular resistance. PH, due to left heart disease is the most common form of PH, accounting for 65-80% of cases. PH results in remodeling processes in the vessel wall of the pulmonary artery, which is associated with stiffening of the vessel wall and an increased collagen to elastin ratio in the extracellular matrix. Only a few drugs are approved for the treatment of PH (Prostanoids, sGC stimulators (Riociguat), endothelin receptor antagonists and phosphodiesterase-5 inhibitors). However, the effectiveness of the drugs is low and the drugs do not lead to cure, but only delay the disease progression. Further on, these drugs are only approved for the rare case of pulmonary arterial hypertension (incl. idiopathic PH). There are no pharmacological therapies presently approved for the treatment of the most frequent forms of PH due to left heart disease or lung disease.

#### Technology

It has surprisingly found that Pentagalloyl-glucose (PGG) – a pentagallic acid ester of glucose- either as a free substance or coupled to a delivery vehicle, is a suitable drug candidate for the treatment of pulmonary artery stiffness in PH. The application of PGG in *ex vivo* cultured human pulmonary arteries increased the elastin content in the pulmonary artery wall of PHs after treatment with elastase and increased the elasticity of pulmonary arteries after treatment with elastase. In an *in vivo* rat model of PH due to left heart disease, the application of PGG leads to reduced right ventricular pressure load and right ventricular hypertrophy, to largely reversed pre-existing PH and right ventricular hypertrophy, to improved organization of elastic fibres in the PA wall as well as to counteracted PA stiffening, and normalized PA biomechanics *in vivo* and *ex vivo*.

#### Benefits

- ✓ Drug candidate for improving the biomechanical properties of pulmonary arteries in pulmonary hypertension
- ✓ PGG has stabilizing effects on elastin

#### Application

Treatment and prevention of pulmonary hypertension  
Treatment of pulmonary artery stiffness

#### Commercial Opportunity

Searching for a licensing or developing partner

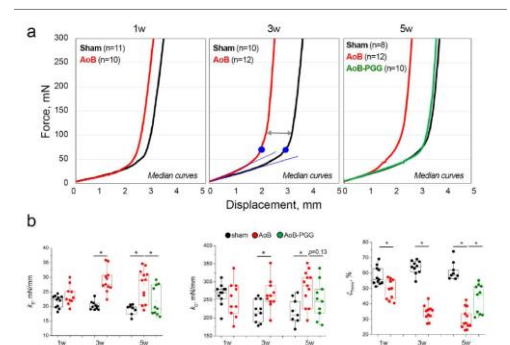


Fig. 1: Nanoparticle-based PGG application improves pulmonary arterially biomechanics (*ex vivo* rat pulmonary artery)

#### Key words

Pentagalloyl-Glucose, PGG, pulmonary hypertension, left heart disease, pulmonary artery stiffness

#### Developmental Status

*in vivo* (rat model of PH), *ex vivo* (human, rat)

#### IP Status

EP patent application (10/2021)

PCT patent application (10/2022)

Patent publication [here](#)

#### Patent Owner

Charité – Universitätsmedizin Berlin

#### Contact

Dr. Bettina Büttner  
Senior Technology Manager

Tel.: +49 30 450 570 874  
Fax: +49 30 450 5750 964  
Bettina.Buettner@charite.de  
<http://technologietransfer.charite.de>  
[www.bihealth.org/de/CBI](http://www.bihealth.org/de/CBI)