

Treatment of Pulmonary Hypertension (PH) Using Nitrite Therapy

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Technology description

Summary

Pulmonary Hypertension (PH) occurs as a primary or idiopathic disease as well as secondary to a number of pulmonary and systemic diseases, such as neonatal PH and sickle cell disease. There is no cure for pulmonary hypertension, a nitric-oxide deficient state characterized by pulmonary vasoconstriction and systemic hypoxemia and therapies vary in efficacy and cost. Recent studies by NIH researchers and their collaborators provided evidence that the blood anion nitrite contributes to hypoxic vasodilation through a heme-based, nitric oxide (NO)-generating reaction with deoxyhemoglobin and potentially other heme proteins. These initial results indicate that sodium nitrite can be used as a potential cost-effective platform therapy for a wide variety of disease indications characterized broadly by constricted blood flow or hypoxia.

These results have been further corroborated by more recent work in the neonatal lamb model for PH. Inhaled sodium nitrite delivered by aerosol to newborn lambs with hypoxic pulmonary hypertension elicited a rapid and sustained reduction (65%) in hypoxia-induced pulmonary hypertension. Pulmonary vasodilation elicited by aerosolized nitrite was deoxyhemoglobin- and pH-dependent and was associated with increased blood levels of iron-nitrosyl-hemoglobin. Notably, short term delivery of nitrite dissolved in saline through nebulization produced selective, sustained pulmonary vasodilation with no clinically significant increase in blood methemoglobin levels. . This new, simple and cost-effective potential therapy for neonatal PH is available for licensing. Also available for licensing are claims directed to nitrite salt formulations associated with elevated blood pressure, decreased blood flow or hemolytic disease (HHS Ref. No. E-254-2003/2) as well as for the treatment of specific conditions including hepatic, cardiac or brain ischemia-reperfusion injury and other cardiovascular conditions.

Institution

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联系我们



叶先生

电话：021-65679356

手机：13414935137

邮箱：yeyingsheng@zf-ym.com