# Therapeutic Target and Diagnostic for Pulmonary Arterial Hypertension

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## BACKGROUND

Pulmonary arterial hypertension (PAH) is characterized by increased pulmonary vascular resistance, in part due to contraction and increased proliferation of pulmonary artery smooth muscle cells (PASMC). PAH causes symptoms such as shortness of breath, fatigue and chest pain. As the condition worsens, its symptoms may limit physical activity and can result in enhanced morbidity and early mortality. PAH results in added stress on the heart with strain and weakness of the right ventricle. The heart may become so weak that it can no longer pump sufficient blood, resulting in heart failure, the most common cause of death associated with PAH. Since the second messenger 3’5’-cyclic adenosine monophosphate (cAMP) produces relaxation and decreases proliferation of PASMC, drugs that activate G protein-coupled receptors (GPCRs) to stimulate Gαs or to inhibit Gαi, both of which effects will increase cAMP, may provide therapeutic approaches to treat PAH and such GPCRs may be novel therapeutic targets. The GPCR targets revealed here may prove of benefit to the large number of patients with various types of pulmonary hypertension who share the same vascular pathology.

## TECHNOLOGY DESCRIPTION

UC San Diego investigators have identified GPCRs whose expression is altered in PAH, including an orphan GPCR that is over-expressed in PASMC from PAH patients and animal models of the disease and that may be an attractive target for treating PAH. An antibody directed at this orphan GPCR reduces the increased proliferation of PASMC from PAH patients and increases cellular cAMP levels. Further, this GPCR can be detected in the blood of PAH patients and thus may be suitable as a noninvasive companion diagnostic.

## APPLICATIONS

Possible commercial applications include a diagnostic and therapeutic target for PAH.

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## OTHER INFORMATION

**CATEGORIZED AS**

- **Biotechnology**
  - Health
- **Medical**
  - Diagnostics
  - Disease: Cardiovascular and Circulatory System
  - Disease: Respiratory and Pulmonary System
  - Therapeutics

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