

## **PULMONARY VASCULAR MECHANICS**

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### **MINI-SYMPOSIUM PROPOSAL**

**Keywords:** *pulmonary hypertension, fluid mechanics, solid mechanics*

#### **1 BACKGROUND**

Pulmonary hypertension (PH) is a rare disease of the pulmonary system characterized by elevated blood pressure due to vessel stiffening. The remodeled pulmonary vessels lose some of their ability to store and deliver blood, leading to heart failure as the end stage of the disease [1]. Currently, the only curative treatment option is lung transplantation. Despite the poor prognosis, the pulmonary system remains understudied. However, hypertension in the pulmonary circulation is significantly more aggressive than in the systemic circulation, with a 3-year survival rate of only 48% [2]. PH is also 2-4 times more prevalent in women than in men [3].

#### **2 MOTIVATION**

The process that allows for the dynamic remodeling of the pulmonary vessels remains unknown. The lesions formation found in PH patients obstruct blood flow and prevent the vessels from dilating or constricting, thus preventing their normal function. Because the symptoms of PH are non-specific and there is no non-invasive early diagnosis technique that can be used in a routine exam, by the time the disease is diagnosed, the patient is already in an advanced stage and has to be put in a transplant list. This highlights the need to advance knowledge of the underlying mechanobiology governing this pathology.

#### **3 FOCUS OF THE MINI-SYMPOSIUM**

The purpose of this mini-symposium is to bring together researchers in the pulmonary vascular mechanics field with clinical expertise, vascular biology, and biomechanics focusing on different approaches to investigate vascular changes in PH.

The goal is to provide a picture of the current knowledge in this field and describe current research efforts. Topics to be considered include: the role of hemodynamics, the role of biomechanics, effects of growth and remodeling, and the role of inflammation.

Herein, we propose to invite the following researchers that are at the vanguard of the field.

**Robin Shandas**

University of Colorado Denver

**Naomi Chesler**

University of Wisconsin at Madison

**Kendall Hunter**

University of Colorado Denver

**Kurt Stenmark**

University of Colorado

**Irene Vignon-Clementel**

INRIA Paris-Rocquencourt, Le Chesnay Cedex, France and UPMC Univ Paris 6

**Katherine Yanhang Zhang**

University of Boston

## **REFERENCES**

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