New Device to Test for Pulmonary Function for 21st Century Care

Tech ID: 32913 / UC Case 2020-234-0

BACKGROUND

Spirometry and Plethysmography are the primary methods to characterize pulmonary function for most lung diseases (such as COPD and asthma). However, these century-old measurement techniques present challenges in the modern healthcare environment: they are difficult and uncomfortable for patients to accurately self-administer, day-to-day tracking to monitor disease progression can be challenging due to measurement variations, and the amount of data is limited and only most evident for more severe pulmonary cases. New methods for characterizing lung function could be transformative for care delivery and patient outcomes.

BRIEF DESCRIPTION

Prof. Mona Eskandari, whose research is known for seminal strides in experimental characterization and computational modeling of lung structural mechanics using novel techniques developed in her lab, has discovered a new method for measuring pulmonary function. It works by analyzing the change in temporal pressure while a patient is holding their breath. The measurement device is simple, comfortable and error-free for the patient to self-administer. Algorithms are used to transform the detailed lung data collection into actionable metrics for early detection capabilities for medical intervention and prevention. The discovery could provide more accessible, detailed, timely, and actionable data on lung function compared to conventional and currently used methods.

Fig 1: The medical device prototype being tested in the laboratory

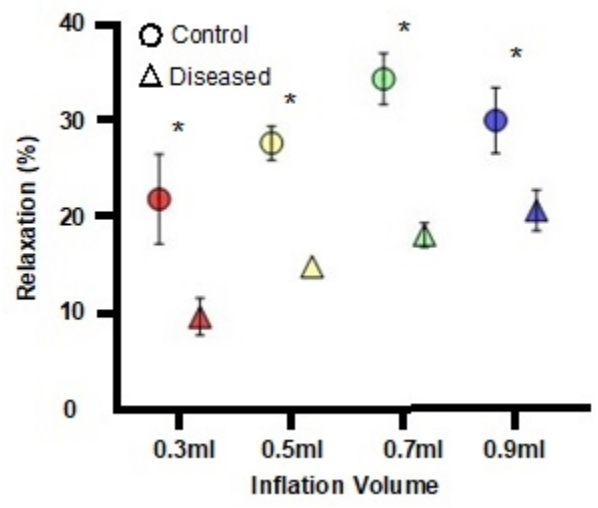

Fig 2: Preliminary data exhibiting detectable differences between several healthy and diseased mice lungs when utilizing the proposed new pulmonary function method

APPLICATION

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OTHER INFORMATION

KEYWORDS

pulmonary, pulmonary function test, PFT, lung disease, COPD, asthma, lung function, breath, spirometry, chronic obstructive pulmonary disease

CATEGORIZED AS

- **Medical**
  - Devices
  - Diagnostics

RELATED CASES

2020-234-0

▶ A new type of pulmonary function test that is quick, easy, and accurate for a patient to self-administer while providing greater insight for lung health than spirometry

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20230197262	06/22/2023	2020-234

RELATED MATERIALS

▶ Quiros et al. 2022. “Mouse lung mechanical properties under varying inflation volumes and cycling frequencies.” Nature Scientific Reports, https://doi.org/10.1038/s41598-022-10417-3 - 05/02/2022

▶ Sattari et al. 2020. “Introducing a Custom-Designed Volume-Pressure Machine for Novel Measurements of Whole Lung Organ Viscoelasticity and Direct Comparisons between Positive- and Negative-Pressure Ventilation.” Frontiers in Bioengineering and Biotechnology, https://doi.org/10.3389/fbioe. 2020.578762. - 10/21/2020

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