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Nasal Airway On Chip: New Platform for Preclinical Testing

ID: 04563

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Asthma affects 26 million people in the US and costs over $80 billion per year. Because of inadequate efficacy and/or adverse side-effects, existing asthma drugs do not adequately address this burden. Also, considering that only one out of 10,000 candidate compounds get FDA approved at a cost of ~2.5 Billion dollars and ~15 years, new pre-clinical methods that improve the predictability of clinical performance can generate considerable value. Current preclinical methods for testing asthma drug candidates primarily involve cell culture of human cells and animal models. These methods have demonstrated a lack of predictability, which may be caused by the lack of modeling of the epithelial airway interaction. We thus propose Nasal Airway On Chip, a human cell assay that mimics the airway interaction with pulmonary epithelial cells. The nose is the window to the lung. Nasal Airway On Chip is designed to allow for the collection of more robust human-cell data that will increase the success rate of new target drugs in clinical testing, and dramatically reduce overall costs incurred by pharmaceutical companies, and disease modeling for research laboratories.

Technology Description

Primary nasal airway cells can be grown in a micro-fluidic chip device. The device includes a porous membrane in the middle plastic layer and two sealable glass layers creating two chambers. The platform can be used for airway diseases, allergies, drug testing by aerosol and vascular delivery. Having a human multicellular system can result in robust data on lead drugs which lowers time and cost in preclinical and clinical testing.

Advantages

- Easy access to nasal cells
- Customizable for numerous cell combinations
- Can be applied to many airway diseases

Applications

- Testing for: airway diseases, Allergies, Human environment interactions
- Identify biomarkers
- Drug testing by aerosol & vascular delivery

Nasal Airway On Chip for pre-clinical efficacy testing

Stage of Development

Conceptual Stage; customer discovery interviews conducted with pharmaceutical companies that have respiratory diseases portfolio and academic researchers

Product Development Stage; The proof-of-concept of this platform is being tested in the fall 2018

IP Status

Pending.

Notable Mentions

First Gear Summer Cohort Accelerator Program: $3,000

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