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HiLung

Recreating Lung Cells to Eliminate Respiratory Illnesses

Apart from cancer and cardiovascular diseases, lung and respiratory disorders are leading causes of morbidity and death worldwide. Even with the most advanced medical technology, researchers face various roadblocks in developing practical and curative treatments for many respiratory illnesses.

While human lung models exist, there are many barriers in the reliable cultivation of primary cells at the mass scale. Pharmaceutical companies, till recently, relied on animal lungs as recreating models to mimic exact lung functions. Enabling medical companies to fast-track drug discovery and clinical research, HiLung mass-produces lung cells with the world's first practical and scalable application of stem cell differentiation induction technology.

"Based on our proprietary stem cell differentiation technology, we are the first to mass produce and stably cultivate human respiratory epithelial cells equivalent to living human organs," says Dr.Yuki Yamamoto, CEO of HiLung.

HiLung induces stem cell differentiation into human respiratory epithelial cells based on its vast portfolio of patented differentiation technologies. This process has enabled it to mass-produce cells and create a model with the same functions as living organisms, resembling human pathophysiology in vitro. HiLung creates lung models with cells that mimic similar tasks as living organisms. Replicating human physiology and the effects of diseases, the lung models assist researchers in identifying abnormalities. The reconstructed human cells accurately assess patient-level target discovery, stratification, validation, lead discovery, and optimization.

HiLung's proprietary technologies, which enable the differentiation induction process concerning respiratory cells and organs, are complemented by extensive research and commitment to transforming drug discovery processes. Its technologies and cell models are widely used in the medical industry for respiratory drug

discovery, preclinical trials, and human-relevant disease models for drug screening or evaluations.

The lung models, accurately resembling human physiology, assist pharmaceutical companies in developing therapeutics for idiopathic pulmonary fibrosis, inflammatory respiratory diseases, infections like COVID-19 and influenza, and rare diseases like cystic fibrosis. To identify novel drug candidates and therapeutics, HiLung is furthering its partnerships with pharmaceutical companies for the opportunity to conduct collaborative research.

HiLung's unique and versatile tools, used to evaluate respiratory diseases, enable pharmaceutical companies to analyze lung cells at a large scale, which was not possible earlier. Using pluripotent stem cell technology, HiLung achieves mass lung cell production to develop airway and alveolar multi-well plates for pathophysiological and therapeutic research and development. The HiTrach plate, which recapitulates human airway morphology and gene or protein expression, reproduces human airway pathologies, including SARS-CoV-2 and flu infection. The HiTrach-96 and 384 well plates are used for advanced drug screening applications and assist in developing interface systems. Offering highly scalable iPSC-derived airway epithelial cells, which create more extensive throughput assays for drug screening, the iPSC-based airway epithelial cells are available in a ready-to-use multi-well format.

Assisting pharmaceutical companies and research organizations in accelerating drug discovery and development to treat respiratory diseases, HiLung reconstructs lung models using highly functional cells to mimic the human lung. Its technologies enable drug screening at a high rate by reducing the time required for drug development and streamlining preclinical trial processes. Leveraging its proprietary stem cell differentiation technology, HiLung has developed innovative therapies, like regenerative medicine, to meet the goal of globally eliminating respiratory diseases. 



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Kyoto,
Japan