

North America In-Vitro Lung Model Market Size and Forecast (2021 - 2031)

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Abstracts

The North America In-Vitro Lung Model Market is projected to grow significantly, reaching an estimated US\$ 642.8 million by 2031, up from US\$ 186.3 million in 2024, reflecting a robust compound annual growth rate (CAGR) of 19.5% from 2025 to 2031. This growth is primarily driven by technological advancements and an increasing focus on developing more sophisticated in vitro models that closely replicate human lung physiology.

Executive Summary and Market Analysis

The North American in vitro lung model market encompasses the United States, Canada, and Mexico, with the U.S. expected to dominate the market share. The region's strong biomedical research infrastructure, characterized by leading academic institutions, research organizations, and pharmaceutical companies, is pivotal in advancing in vitro lung modeling. These entities leverage state-of-the-art facilities and cutting-edge technologies to innovate and enhance the functionality of lung models, which are crucial for drug discovery and toxicology studies.

Technological innovations such as tissue engineering, microfluidics, and organ-on-a-chip technologies have significantly improved the accuracy and predictive capabilities of in vitro models. These advancements not only enhance the reliability of preclinical testing but also reduce the reliance on animal testing, aligning with the growing emphasis on animal welfare and ethical research practices.

Market Segmentation

The North America In-Vitro Lung Model Market is segmented by type, application, and

end user:

By Type: The market is divided into 3D Models and 2D Models, with 3D Models holding the largest market share in 2024.

By Application: The applications include Drug Discovery and Toxicology Studies, Physiological Research, Regenerative Medicine, and others, with Drug Discovery and Toxicology Studies leading the market.

By End User: The primary end users are Pharmaceutical and Biotechnology Companies, Academic and Research Institutes, among others, with pharmaceutical companies dominating the market.

Market Outlook

The rising prevalence of chronic respiratory diseases such as Chronic Obstructive Pulmonary Disease (COPD) and asthma is a significant driver for the in vitro lung model market. According to the Global Initiative on Chronic Obstructive Lung Disease, approximately 65 million people suffer from COPD globally, with nearly 3 million deaths annually. The World Health Organization (WHO) reports that around 334 million people are affected by asthma. In the U.S. alone, about 34 million individuals are diagnosed with chronic lung diseases, highlighting the urgent need for effective research models to understand these conditions and develop new treatments.

The increasing incidence of lung cancer, which is the most common cancer and a leading cause of cancer-related deaths, further emphasizes the necessity for advanced research models. The American Lung Association reported that approximately 26 million people in the U.S. had asthma in 2022, and lung cancer statistics indicate a significant number of new cases and deaths each year. This growing burden of respiratory diseases is driving demand for innovative research models that can facilitate the understanding of disease mechanisms and the development of effective therapies.

Country Insights

The U.S. holds the largest share of the North America In-Vitro Lung Model Market. The Asthma and Allergy Foundation of America reported that around 26 million people in the U.S. had asthma in 2022, with thousands of deaths attributed to the disease. The rising incidence of lung-related diseases necessitates the development of effective

treatments, which in turn drives the adoption of innovative research models.

Collaborative research efforts are also on the rise, with organizations like ATCC partnering with initiatives to provide a variety of next-generation in vitro cancer models. Notably, a recent development from Harvard University's Wyss Institute has led to the creation of a human in vitro model that mimics radiation-induced lung injury, showcasing the potential of these models in preclinical drug discovery.

Key Players

The market features several key players, including Charles River Laboratories, Lonza Group, Merck KGaA, and ATCC, among others. These companies are actively pursuing strategies such as product innovation, expansion, and mergers and acquisitions to enhance their market presence and offer cutting-edge solutions to their customers.

Research Methodology

The report's findings are based on a comprehensive research methodology that includes both secondary and primary research. Secondary research involves gathering data from various sources, including company reports, industry publications, and government documents. Primary research consists of interviews with industry stakeholders and experts to validate findings and gain deeper insights into market trends and dynamics.

In conclusion, the North America In-Vitro Lung Model Market is poised for significant growth, driven by technological advancements, increasing prevalence of respiratory diseases, and a strong research infrastructure. The ongoing development of innovative models will play a crucial role in advancing lung disease research and treatment.

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