

Press Release

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Collaborative Breakthrough in Lung-on-Chip Technology: AlveoliX, Vitrocell, University of Bern and Helmholtz Institute for Pharmaceutical Research Saarland Drive Advances in Human Respiratory Research

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AlveoliX, in collaboration with Vitrocell Systems, the University of Bern, and the Helmholtz Institute for Pharmaceutical Research Saarland (HIPS) is proud to announce the publication of a landmark study in Bioengineering & Translational Medicine. The study, titled “A stretchable human lung-on-chip model of alveolar inflammation for evaluating anti-inflammatory drug response”, was made possible through the AIM-4-Doc grant from Eurostars.

This study demonstrates how this Lung-on-Chip model provides an advanced platform to study human lung function, offering a more accurate and predictive approach to investigating respiratory diseases and testing potential treatments.

Key Findings of the Study

AlveoliX’s Lung-on-Chip model accurately mimics the human alveoli’s microenvironment, simulating breathing dynamics and disease conditions. Such cutting-edge technology enables high-fidelity disease modeling, drug screening, and toxicity testing, empowering researchers to explore therapies for complex lung diseases such as chronic obstructive pulmonary disease (COPD), asthma, pulmonary fibrosis and acute respiratory distress syndrome (ARDS).

One of the standout features of this system is the integration of patient-derived cells, enabling personalized treatment strategies tailored to individual responses. The Lung-on-Chip model not only bridges the gap between preclinical and clinical outcomes but also reduces reliance on animal testing, aligning with the 3R principle (Replace, Reduce, Refine).

Collaborative effort and industry impact

This study is the result of a strong collaboration between two industry entities, AlveoliX and Vitrocell Systems, and two academic partners, the University of Bern and the University of Saarland. The AIM-4-Doc project brought together expertise from industry and academia to push the boundaries of Lung-on-chip technology. Through this collaboration, the Alexis Technologies spin-off was later initiated, further driving innovation in the field by providing these unique systems that combine inhalation exposure systems with breathing Organs-on-Chip technology, opening up broad applications in toxicological assessment of new chemicals, pesticides, cosmetic safety evaluations, and environmental pollutant studies.

Quotes from Core contributors:

«We are happy to have partnered with academic and industry pioneers to demonstrate the transformative potential of organ-on-chip models. Our Lung-on-Chip technology marks a clear leap forward in respiratory research, offering a more accurate and ethical approach to studying human lung diseases and testing new treatments. This study is a testament to the power of collaboration and innovation in solving some of the most pressing challenges in healthcare.» **Dr. Nina Hobi, CEO of AlveoliX**

«I am pleased to see that, after initiating the collaboration with Claus-Michael Lehr's group, the AlveoliX team took the project further and brought it to full maturity, as demonstrated in this excellent article. Lung-on-chip technology underscores the importance of replicating breathing movements in vitro to better emulate biological functions. This research shows that the alveolar barrier is more sensitive to TNF α /IFN γ inflammation under breathing-like dynamics.» **Prof. Olivier Guenat, ARTORG Center for Biomedical Engineering, University of Bern**

«The AIM-4-Doc grant laid the groundwork for what eventually became Alexis Technologies, allowing us to develop dynamic inhalation exposure technologies. These platforms hold immense potential for driving advancements in personalized medicine, as well as safety and efficacy testing across a range of industries, including environmental toxicology and pharmaceutical development.» **Dr. Arunima Sengupta, Alexis Technologies**

«The cooperation in this research and development project has been excellent and very productive. The result is the commercially available compact exposure system Cloud Alpha AlveoliX AX12. It is now the worldwide leading turnkey system for direct liquid aerosol exposure of a breathing lung-on-chip at the air-liquid interface. A big "thank you" to all project members!» **Tobias Krebs, Managing Director Vitrocell Systems**

«Most respiratory drugs fail in late clinical stages due to efficacy issues. Therefore, there is a huge need for predictive disease-relevant tools to evaluate possible drug candidates and new therapies. We used the novel technologies of our industry partners to develop a proof-of-concept model for pulmonary drug response and are more than happy to be part of such fruitful collaboration.» **Dr. Nicole Schneider-Daum, The Helmholtz Institute for Pharmaceutical Research Saarland (HIPS)**

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Future Directions

AlveoliX remains committed to advancing organs-on-chip technologies for multiple organs, focusing on real-world applications in drug discovery and personalized medicine. The company will continue to collaborate with leading pharmaceutical and biotech companies to validate its systems and bring these innovations to the forefront of biomedical research and therapeutic development.

For more information about AlveoliX's Lung-on-Chip technology, please visit www.alveolix.com.

About AlveoliX

AlveoliX is a Swiss-based pioneer in organs-on-chip technology, focused on developing highly predictive and human-relevant models for use in medical research, drug discovery, and toxicology. Established in 2019, AlveoliX is committed to delivering innovative solutions that reduce the reliance on animal testing and improve the precision of human disease modeling.

About Vitrocell

VITROCELL is specialised in the development of advanced in vitro exposure systems. VITROCELL realizes turnkey installations for in vitro inhalation research where gases, complex mixtures, environmental atmospheres, nanoparticles, and pharmaceutical compounds are analyzed on lung cells at the air/liquid interface. The customers of VITROCELL are leading research institutes, contract research organizations, regulatory authorities as well as the pharmaceutical and other industries throughout the world. VITROCELL is dedicated to supporting research by delivering customized components, turnkey installations, international training, and world-class service tailored to meet exactly the customer's requirements.

About The Helmholtz Institute for Pharmaceutical Research Saarland (HIPS)

The Helmholtz Institute for Pharmaceutical Research Saarland (HIPS) was founded in August 2009 through a partnership between the Helmholtz Centre for Infection Research (HZI) and Saarland University. Situated on the Saarland University campus in Saarbrücken, HIPS stands as Germany's inaugural public research institute dedicated to pharmaceutical sciences. Its primary mission revolves around advancing novel anti-infectives and enhancing their translational applicability to human health.

About ARTORG, Center for Biomedical Engineering Research

The ARTORG Center creates innovative healthcare technology by bringing together the biomedical engineering and medicine departments of the University of Bern. To address unmet needs of patients, doctors, and nurses, technical and clinical experts together lead our multidisciplinary research units.

Close to current challenges in preventive medicine, diagnostics, therapy, and disease management, ARTORG contributes to improved clinical care through scientific discovery, deep learning technology, simulation of physiological processes, and the development of novel medical devices and applications for surgery and rehabilitation.