AXILD model: Efficacy testing for new clinical drug candidates to treat pulmonary fibrosis

L.L. de Maddalena[1], N. Albrecher[1], G. Raggi[1], L. Froment[1], A. Cagnan[2] , N. Roldan[1], G. Marchini[2], N. Hobi[1]

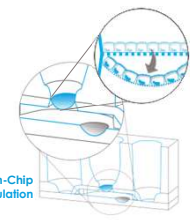
[1]AlveoliX AG, Swiss Organs-on-Chip Innovation - Bern (Switzerland)
[2]Chiesi Farmaceutici S.p.A. - Parma (Italy)
*lea.demaddalena@alveolix.com

AlveoliX
In-vitro models inspired by nature

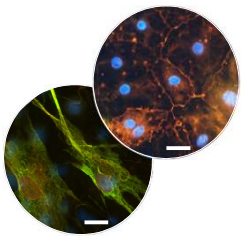
Modelling Organ-specific mechanical cues

To overcome the challenges and ethical concerns linked to animal testing, efforts from industry and academia are focused on finding alternatives to better simulate complex human physiology while improving predictivity and translation.

In this work, we present the **AXBarrier-on-Chip** system, a platform enabling to tune strain parameters to reproduce organ-specific mechanical cues (gut, skin, lung, etc.); or strain related (patho)physiological processes. By resting at the ultra-thin, porous, and soft cell culture substrate of the AX12 plate, cells experience near-physiological conditions and preserve specific phenotypes.



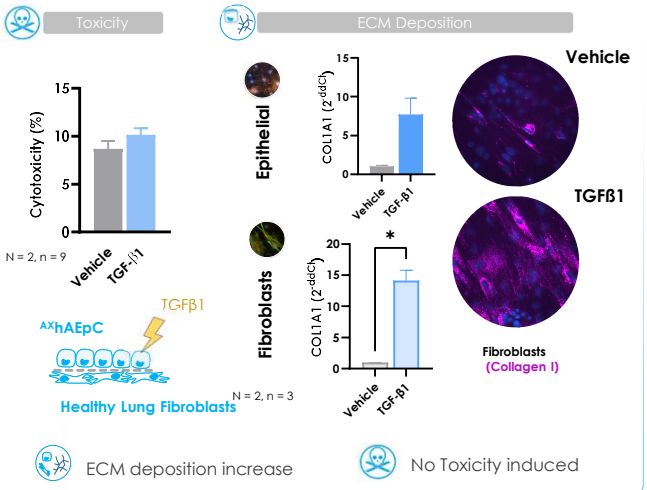
For **interstitial lung disease model (AXILD)** epithelial primary cells (AXhAEpC) and healthy human lung fibroblasts were seeded in co-culture. To trigger lung fibrosis hallmarks, TGF-β1 (10ng/mL) was introduced.
The model was validated using the FDA approved drug Nintedanib (NTD).
A Ref. Compound was tested and run in parallel to the standard of care NTD on the AXILD model as well as an adapted model using AXhAEpC/diseased human lung fibroblast co-culture.



Occludin α-SMA Hoechst

Scale bar: 25 µm

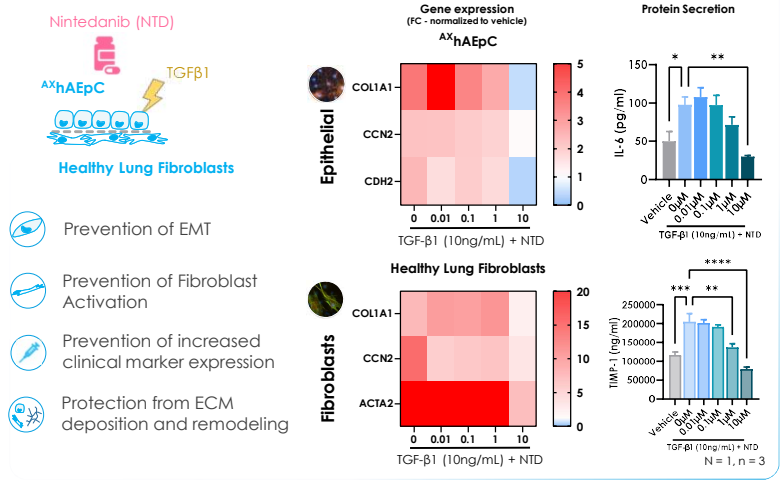
AXILD Model-on-Chip Model development



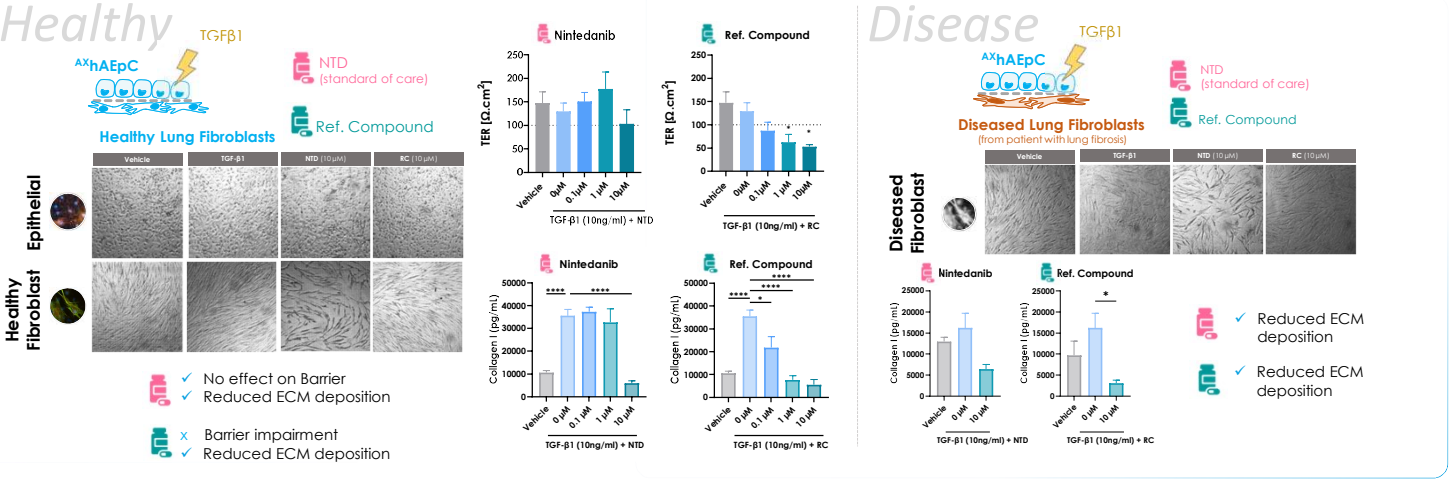
ECM deposition increase

No Toxicity induced

AXILD Model Validation



Drug efficacy application on AXILD and customized model



✓ The AXILD model shows expression of important **lung fibrosis hallmarks** and is internally **validated using the FDA approved drug Nintedanib**.
✓ The AXILD marks substantial advancement in **improving predictive evaluations** for assessment of drug safety and efficacy for new therapeutic compounds during preclinical testing.
✓ The AXILD model is **customizable** to your needs. The customized model can be internally validated using the standard of care Nintedanib.

Contact: info@alveolix.com