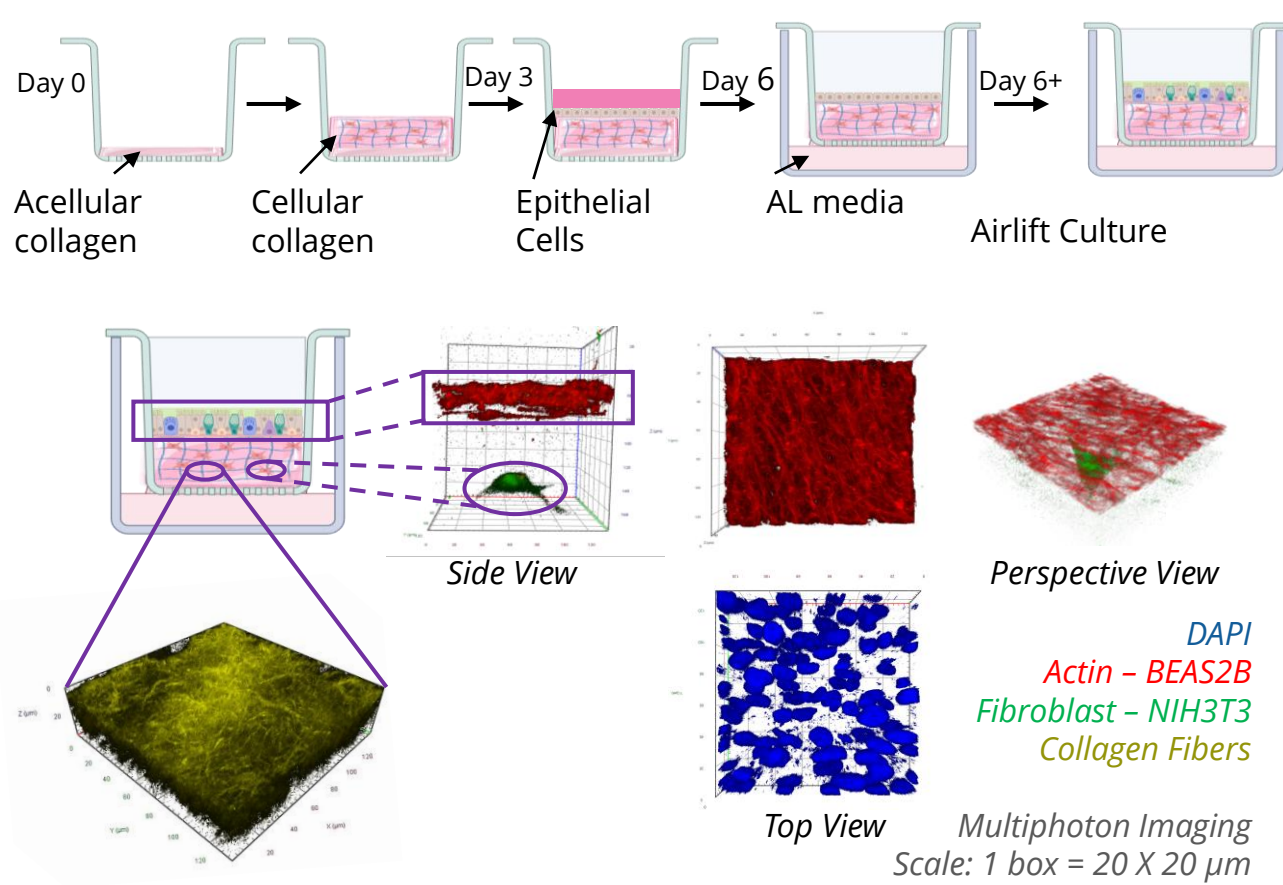


Key Questions

- How cancer initiates from pre-cancer condition?
- How do oncogenic mutants outcompete normal cells?

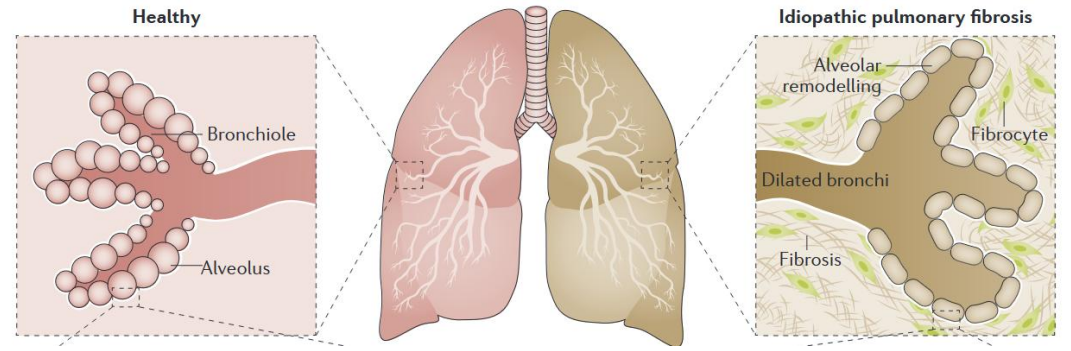
Development

Air-Liquid Interface (ALI) culture of Lung Epithelial cells over Fibroblast containing collagen gel



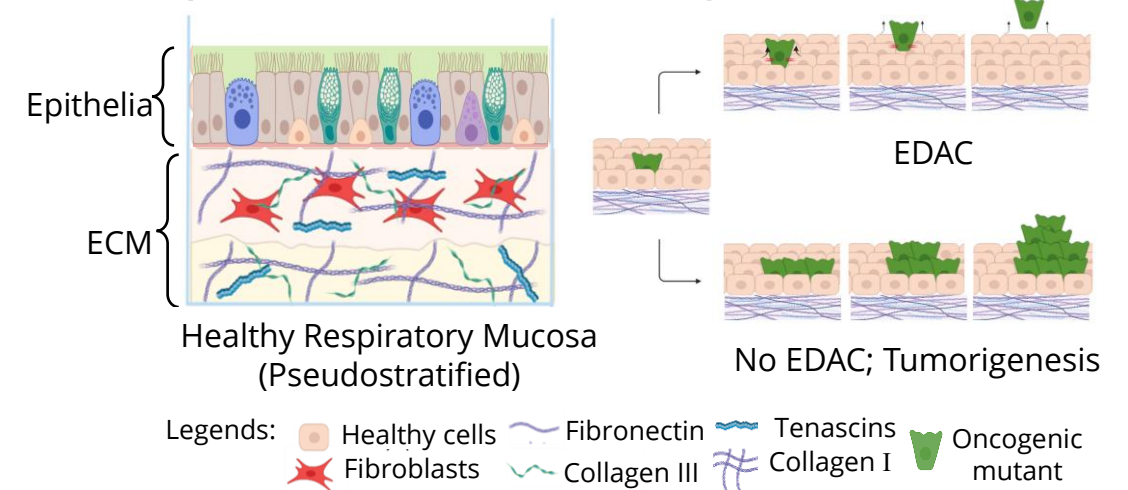
Introduction

Idiopathic Pulmonary Fibrosis (IPF)

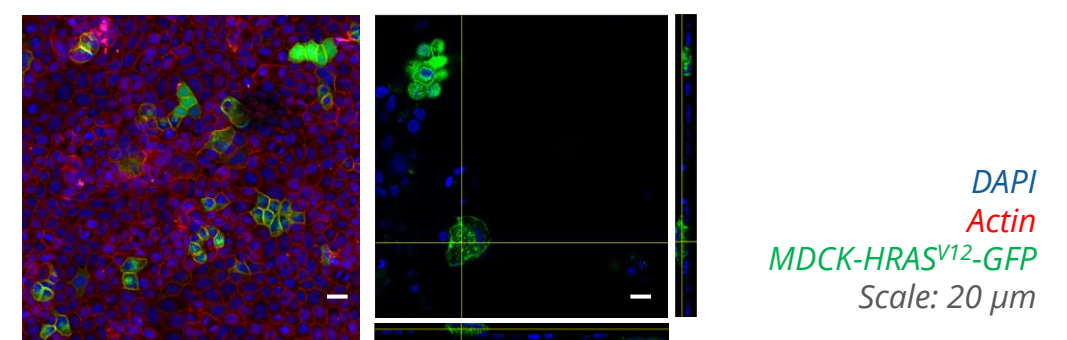


- ✓ **5X** risk of developing cancer
- ✓ **1 out of 4** IPF patient will develop cancer

Epithelial Defence Against Cancer

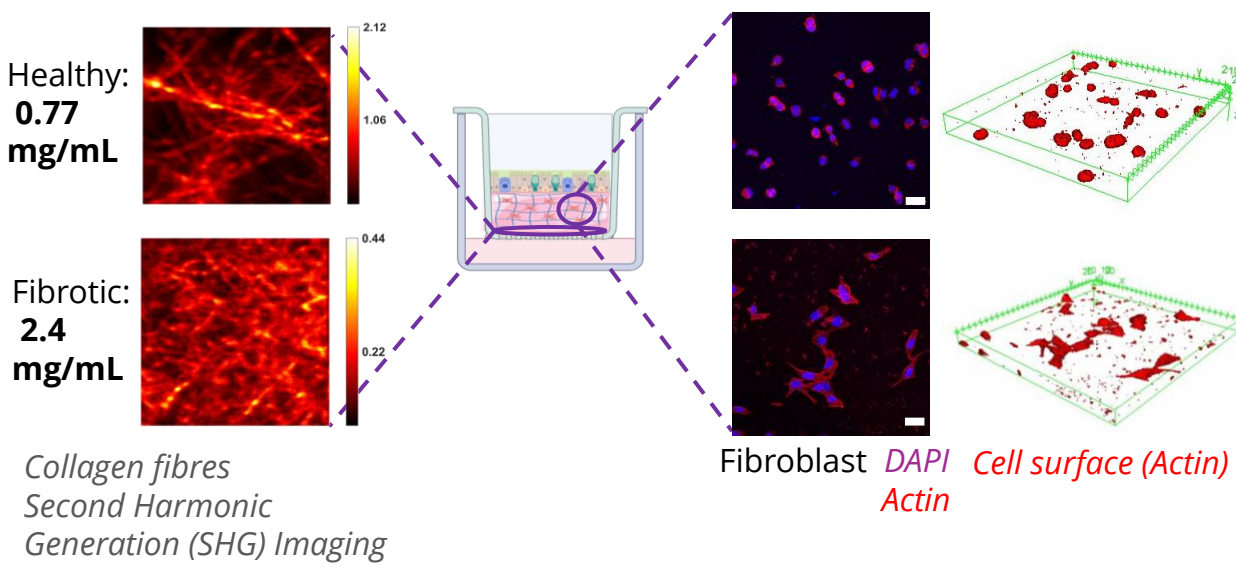


Extrusion of Transformed Cell in a healthy epithelia:

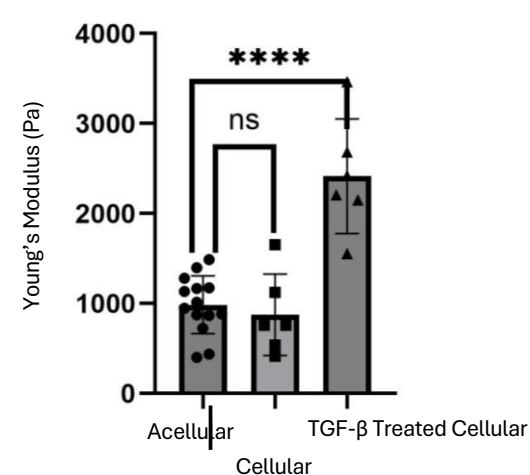
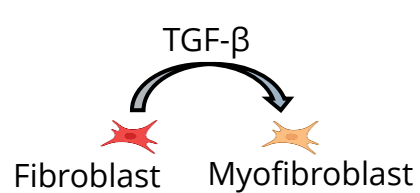


Mimicking Fibrosis

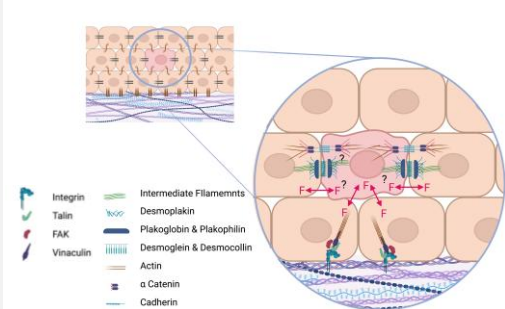
(A) Collagen gel:



(B) Transforming Growth Factor-β:



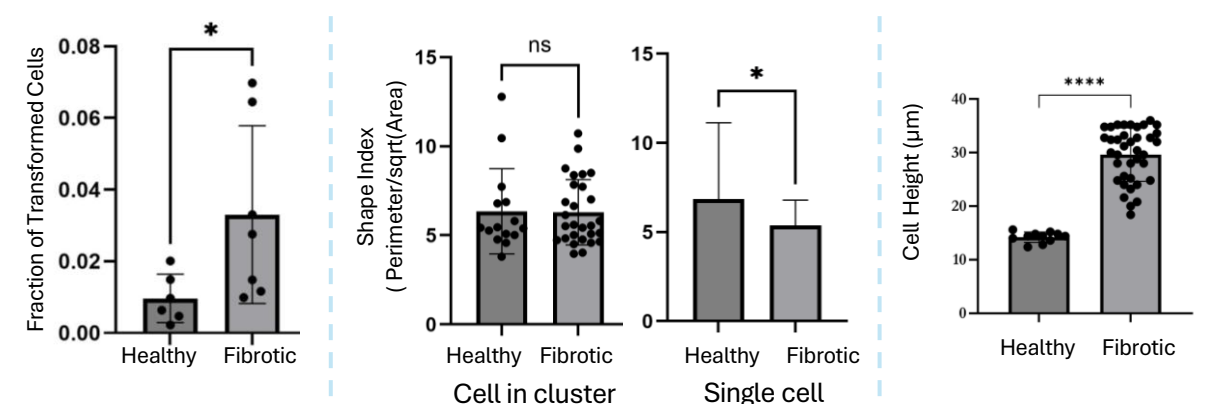
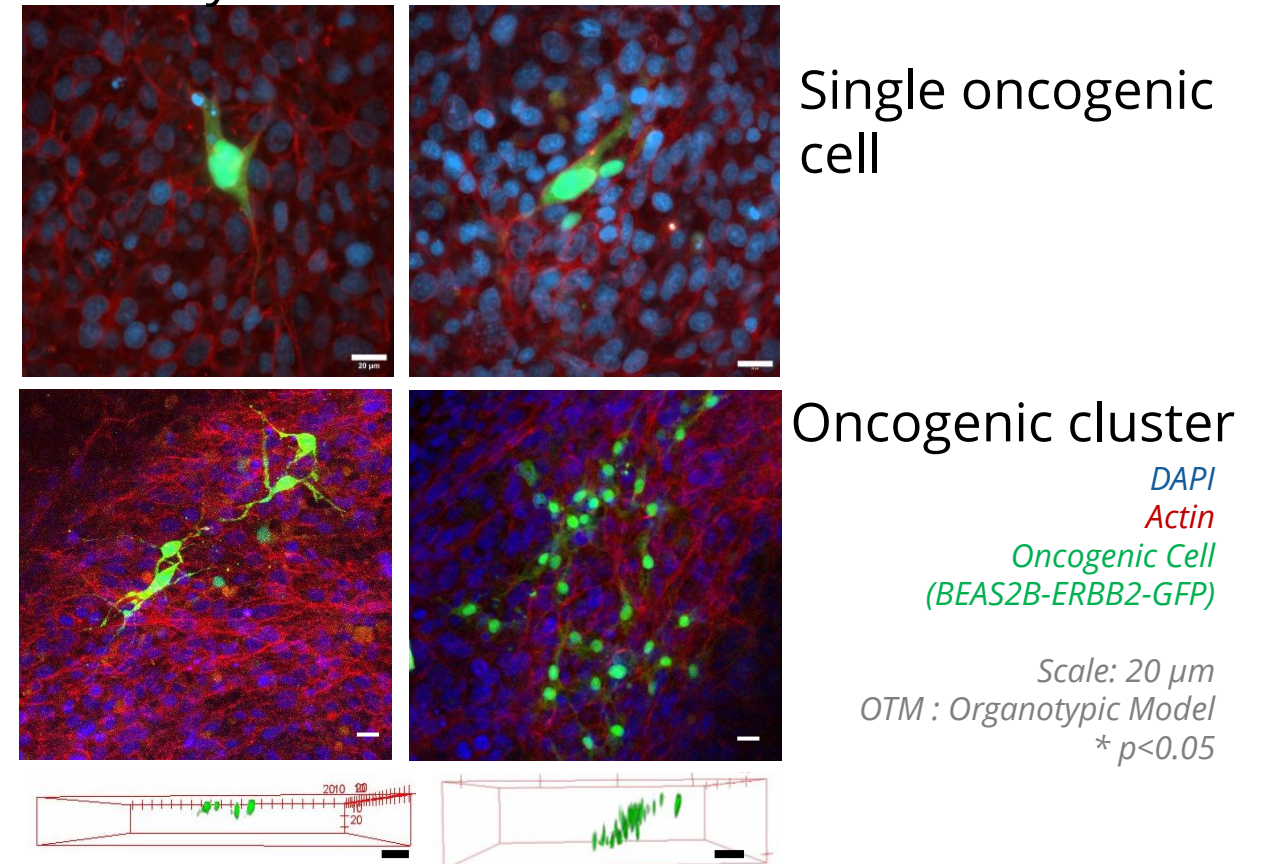
Future Directions



Investigate the **mechanobiological** and **biophysical** signalling leading to tumorigenesis

Tumorigenesis

Healthy OTM Fibrotic OTM



Fibrotic conditions:

- ✓ Promotes Tumorigenesis
- ✓ Alters Transformed-Cell Morphology

References

- Vishwakarma, M., Piddini, E., *Outcompeting cancer. Nat Rev Cancer* 20.
- Dutta, A., Vishwakarma, M., (2025) in *Cancer Systems Biology*, Oxford University Press

Acknowledgement



Contact

