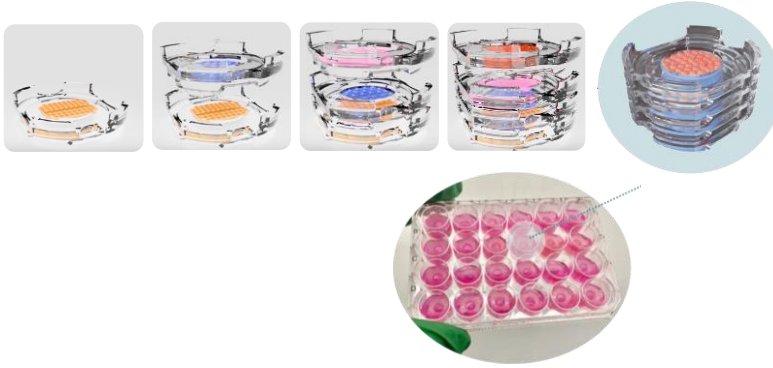


# NANOSTACKS™: novel platforms for Head and Neck Cancer Research

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**Background:** The FDA Modernization Act 2.0 aims to decrease animal testing significantly and support NAM approaches such as micro-physiological systems (organ-on-a-chip OOAC) to improve preclinical drug discovery. OOAC platforms have recently emerged as a new generation of biomimetic alternatives for initial drug screening. Revivocell platform NANOSTACKS™ is used first time in the development of accurate 3D models of head and neck cancer using human cell lines to understand critical aspects of the tumour microenvironment.

## NANOSTACKS™



### Key aspects of NANOSTACKS™

Transparent, stackable inserts- ready-to-use platforms for **3D Cell Cultures**

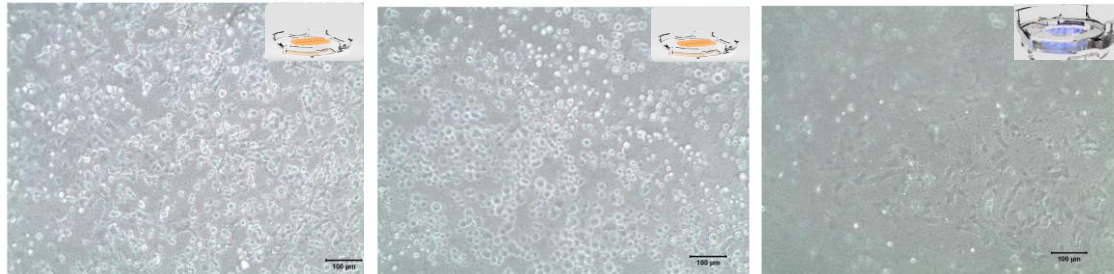
SBS-standard 24-well plate friendly – **Preclinical Drug Screening**

Up to 4 NANOSTACKS™ per well – **Organ Modelling**

Porous membranes facilitate media circulation – excellent mimic for **Microenvironment**

### Head and neck cancer 3D model

NANOSTACKS™ were used to seed cancer cells from both primary and metastasis sites, and fibroblasts (collected from the same patient) and co-cultures were grown for 72h.



Day 1 (seeding after 2h on NANOSTACKS™)

### Day 3 (Control – Monocultures on NANOSTACKS™)

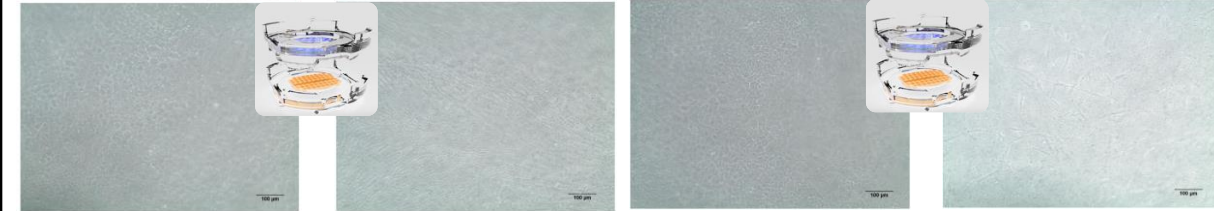


Cancer cells from the primary site of head and neck cancer (P)

Cancer cells from the Metastasis site from the same patient (M)

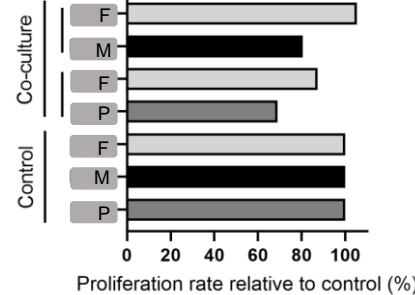
Normal Fibroblasts (F)

### Day 3 ( Test – Co-cultures NANOSTACKS™)



Cancer cells from the primary site with fibroblasts (P+F)

Cancer cells from the metastasis site with fibroblasts (M+F)



Proliferation comparison between the controls and co-culture using MTS assay

The proliferation of P and M are lower compared to control when co-culture with fibroblasts, although M cells have slightly higher proliferation (80.44%) compared to P (68.92%)  
 Fibroblasts co-cultured with P have lower proliferation (87.33%) than the control.  
 Fibroblasts co-cultured with M have higher proliferation (105.32%) than the control.

The POC study proves that **NANOSTACKS™** can be the best platform to understand the tumour microenvironment and provide essential cues to direct and control tumour progression. Further research plans involving cancer-associated fibroblasts and their implications in cancer malignancy, such as angiogenesis, invasion, and therapy resistance to be studied on **NANOSTACKS™**. Revivocell OOAC platforms will have a tremendous advantage in patient-specific disease modelling in the near future.