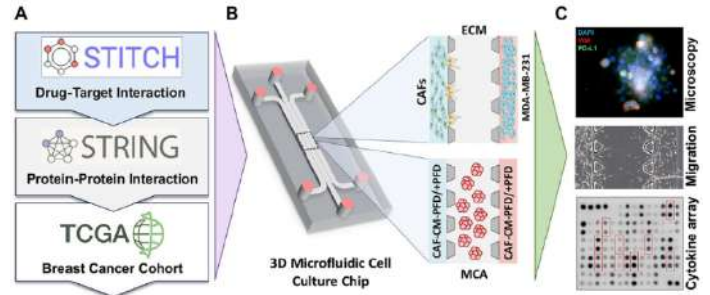# AIM biotech

Cancer-associated fibroblasts (CAFs)는 면역 억제 기능을 강화하기 위한 종양 미세환경(TME)을 조절하는 데 중요한 역할을 하는 것으로 알려져 있습니다. 동물 실험을 통한 연구가 이루어짐에도 불구하고 예측 가능하며 비용적으로도 효율적인 in vitro 3D culture에 대한 수요는 지속적으로 올라가고 있습니다. 이런 흐름에 맞춰 TME model을 in vitro 환경에서 구축하고자 하는 시도들이 있습니다. 이를 연구하기 위한 ex vivo model과 그 평가방법에 대한 정보를 확인해보시기 바랍니다.

More information >>

▶ AIM chip – Ready-to-use microfluidic chip

Microfluidic devices for cell culture

Using microfluidic technologies for 3D cell culture brings additional benefits:

- Microfluidic devices require small volumes of culture media and small quantities of cells, leading to reduced running costs. Studies can be conducted in cases where the cell source is limited (e.g. clinical samples)

- Microfluidic devices have Low space requirements given their small footprints, making it possible to scale up experimental throughput

- Compartmentalisation of cells into different channels/zones & live cell imaging analysis enable experimental designs with spatiotemporal elements


The underside of a microfluidic chip showing the size of its channels (250 microns deep). The chip is 25mm wide, measured from the edges shown above.

Multicellular culture made possible, with meaningful organization into models of biological systmes

The multi-channel design of AIM 3D Cell Culture Chips enables the co-culture of different cell types in distinct compartments in the device, yet allowing paracrine signalling between cell types to take place. the movement of cells between different channels (or within an individual channel) can be easily observed & tracked.
The growth and/or migration of cells within gel can often cause gel shrinkage or degradation. This problem is mitigated by the use of posts in AIM chips. The posts help to stabilize the gel and increase cell culture duration before the matrix collapses.
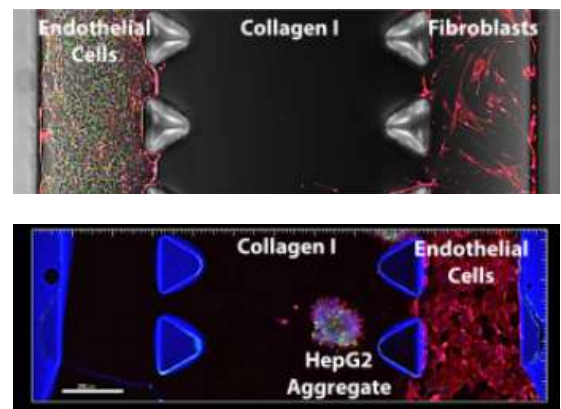
AIMchip
with ImageXpress

MOLECULAR DEVICES
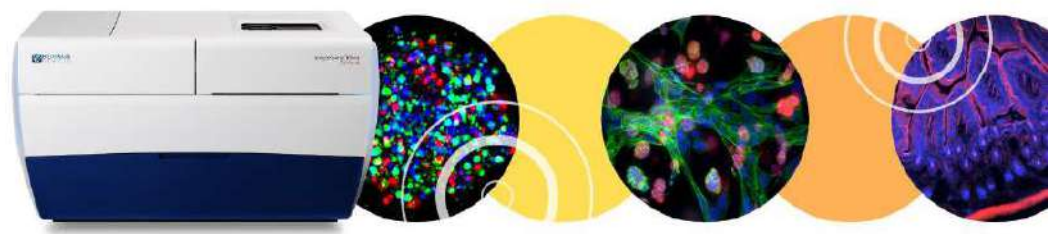
ImageXpress Micro Confocal
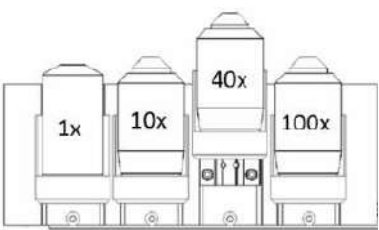### High-Content Imaging System
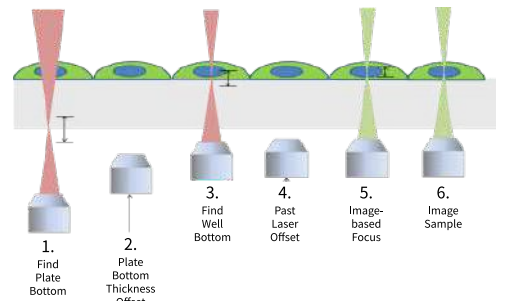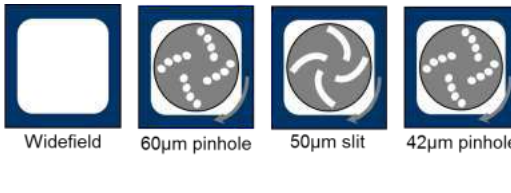
Hardware Options:
- Environmental Control (Temperature, Humidity, CO2)
- Transmitted Light with Phase Contrast (PhL, Ph1, Ph2)
- Fluidics for online pipetting with disposable pipette tips

Widefield 60μm pinhole 50μm slit 42μm pinhole

Confocal Modes:
- 50μm slit (most HTS applications)
- 60μm pinhole (most research applications)
- 42μm pinhole (special research applications)

Laser and Image-based Autofocus:
- Ultra-fast laser autofocus that adapts to any plate type, slide, or dish
- Image-based focus for adjustments of variant distances from the well bottom to the sample.

1. Find Plate Bottom 2. Plate Bottom Thickness Offset 3. Find Well Bottom 4. Fast Laser Offset 5. Image-based Focus 6. Image Sample

Objectives:
Wide selection of ELWD and SWD objectives (air and oil, phase contrast) from 1x to 100x magnification with high numerical apertures (user changeable).
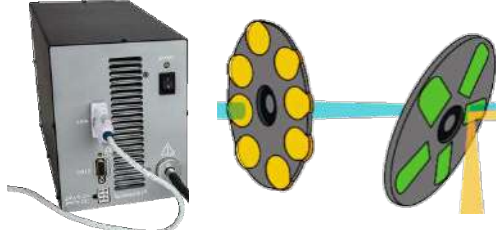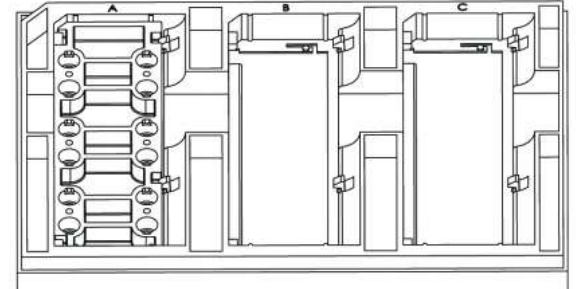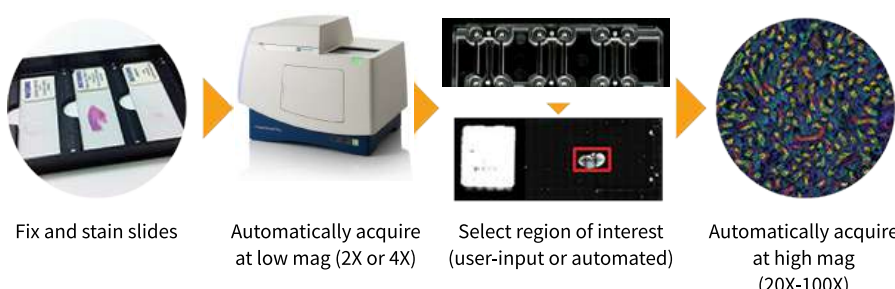
Light Source and Filters:
Super-bright fibre-coupled solid state light engine (long life >20000h). High quality filters (user changeable) in 8-position emission wheel and 5-position dichroic wheel.
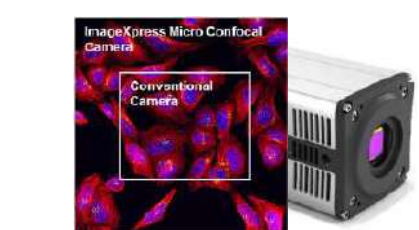
Camera:
4,2 megapixel sCMOS camera with 82% peak quantum efficiency covering more than 3 times the area of a conventional camera. This increases throughput and often eliminates the need for images stitching. Images are saved in 16-bit Tiff format.

Fix and stain slides → Automatically acquire at low mag (2X or 4X) → Select region of interest (user-input or automated) → Automatically acquire at high mag (20X-100X) **or**

Molecular Devices의 ImageXpress는 high-contents imaging system으로 software를 이용하여 실험실 밖에서도 full-automation으로 사용하실 수 있는 장비입니다. MD만의 Laser and image-based dual-autofocus로 사용하시던 culture plate도 바로 적용이 가능하며, 분석 전용 software인 MetaXpress를 통해 자동으로 data를 분석합니다.
AIMchip은 slide glass 크기와 동일하게 제작되며, AIMchip의 holder는 96 well plate와 동일한 규격으로 제작됩니다.
MD ImageXpress의 slide-holder와 96-well plate holder를 이용하여 직접 디자인하신 랩-온-어-칩을 imaging과 동시에 분석해보세요.