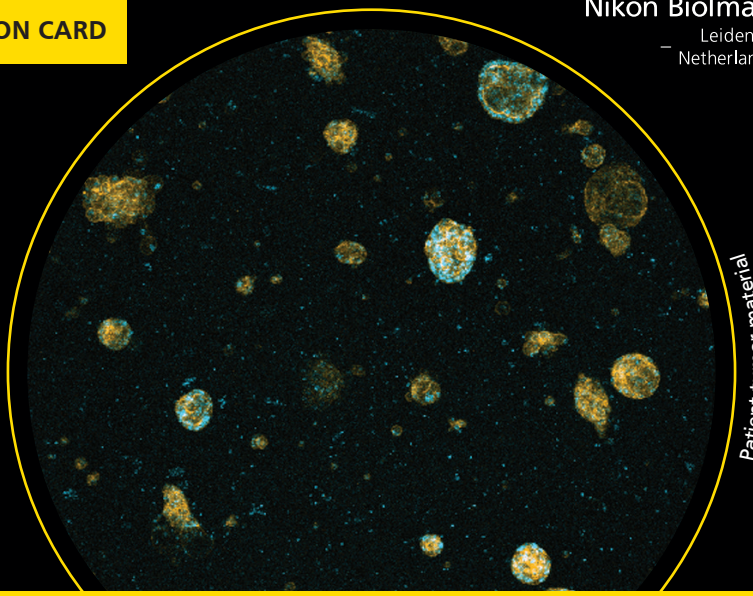
APPLICATION CARD

Nikon BioImaging Lab
Leiden
Netherlands



Speeding up high content imaging

High content imaging is about imaging **more** – more plates, more time points, and more conditions, effectively resulting in more data. It is no wonder that high content imaging and analysis is a powerful tool for so many applications, such as screening for compounds in drug discovery research.

Challenges

The greatest strength of high content imaging – the volume of rich data created – can also be its greatest drawback, **creating critical bottlenecks.** Intelligent acquisition protocols cut down heavily on unnecessary data generation. However, these protocols are complex to design and implement in practice.

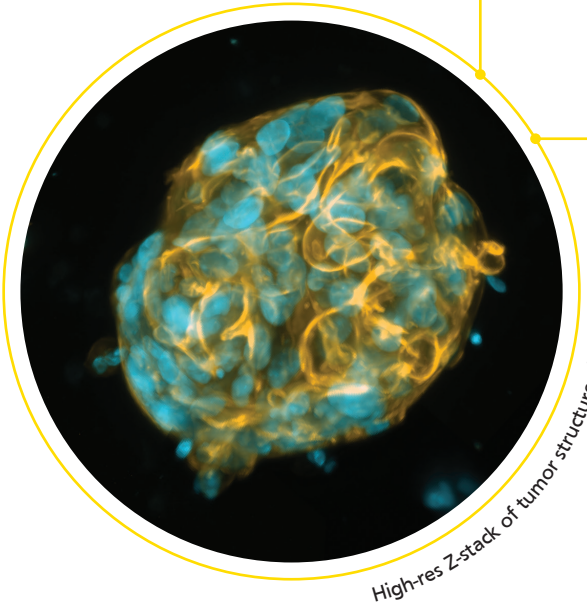
Circumventing the bottlenecks...

The Nikon BioImaging lab (NBIL) has designed automated acquisition protocols that, in conjunction with our cutting-edge imaging systems, the AX R and LIPSI, perform high content imaging at increased speed and capacity by avoiding unnecessary data acquisition... **making sure that we only acquire the data you require.**

Talk to an expert nbil.eu@nikon.com

Imaging specific tumor cell structures

The goal in this application is to **test specific cancer treatments on the tumor material** to determine treatment efficacy *ex vivo* using a patient's own tissue. In this assay, human patient tumor material was seeded in a 384-well plate and grown over time. The resulting primary culture consists of a mix of cell structures but only the tumor cell organoid structures were relevant to acquire.



High-res Z-stack of tumor structures (20x)

METHODS

Sample plate acquired from Vitroscan B.V. Primary cell culture of patient tumor material.

IMAGING

Nikon AX R confocal

>95%

time saved during acquisition

~99.9%

less unnecessary data by intelligently capturing only the relevant images

Our intelligent acquisition protocol therefore allows for important treatment conclusions to be available faster.

We designed an automated protocol that first quickly acquires a stitched large image from each well for an entire 384-well plate using a low magnification objective, then performs on-the-fly data analysis where it identifies the relevant tumor cell structures based on parameters such as size, fluorescence brightness, protein expression, cell clusters, cell numbers per FOV, etc. In this case, the objects of interest were imaged in 3D with two fluorescent channels at 20x and 60X magnification to acquire images of tumor organoids at high resolution.

Nikon BioImaging Lab's services:

01 Assay development › **02** Imaging › **03** Analysis › **04** Reporting