

Microscopes:

DeltaVision OMX-SR:

DOESN'T HAVE A NAME YET

As described by Applied Precision, DeltaVision OMX-SR improves spatial and temporal resolution, providing a clearer view of biology and the ability to image live cellular structures using 3D-SIM technology.

- Super-resolution imaging technologies resulting in increased X, Y, and Z resolution.
- Advanced imaging capabilities expanding your research options.
- Real-time biology with multiplex imaging at high temporal resolution.

Visualizing the spatial and temporal relationships between subcellular structures is key to understanding their structure and function. Many cellular structures and events are well below the spatial resolution limit of traditional optical microscopes or happen on subsecond time-scales, putting them beyond our ability to investigate in greater detail.

The DeltaVision OMX-SR system's exclusive Blaze 3D-SIM module provides an eight-fold increase in volume resolution by improving lateral resolution to approximately 120 nm and axial resolution to approximately 340 nm (wavelength-dependent).

DeltaVision OMX-SR supports multiple advanced and super-resolution imaging options, including high-speed four-color imaging, fast 3D-SIM super resolution, localization imaging, and total internal reflection fluorescence (TIRF) imaging with photokinetic option. The Hopelab/imaging core system utilizes 3 cmos cameras and can image in SIM or conventional modes. Up to four colors can be imaged at one time for static images and standard live imaging. Simultaneous live imaging where all 3 cameras acquire images at the same time can be performed with three fluors of choice.

(<https://www.gelifesciences.com/en/us/shop/cell-imaging-and-analysis/high-and-super-resolution-microscopes/instruments/deltavision-omx-sr-imaging-system-p-03020>)

DeltaVision Elite and Ultra:

"TIMMY"

"JAKE"

"ELWOOD"

"LAVERNE"

"SHIRLEY" – University of Cape Town, Cape Town

"MPENZI" – KAVI, Nairobi, Kenya

"ULTRON" – This is the Ultra

DeltaVision Elite can handle most imaging applications, including widefield fluorescence, time-lapse live cell imaging, multi-point cell tracking, total internal reflection fluorescence (TIRF), and photokinetics. All four systems provided improved image X, Y, and Z resolution and contrast without sacrificing data integrity. The exclusive deconvolution algorithm facilitates quantitation and enables faster data visualization by on-the-fly image deconvolution. Three of the systems incorporate UltimateFocus, which automatically maintains the sample Z position regardless of mechanical or thermal changes. The Focus Assist feedback loop of UltimateFocus determines the distance between the objective and the coverslip. It guides the user to bringing the objective into the area of focus without using the eyepieces or a camera. Furthermore, all four systems include their patented Flexure stages and exclusive NanoMotion III Precision Control motors ensure precise stage movement and stability with excellent repeatability for multiple-point sampling during time-lapse experiments. (http://www.gelifesciences.com/webapp/wcs/stores/servlet/catalog/en/GELife-Sciencesus/products/AlternativeProductStructure_23807/29065728)

IVIS Lumina III:

NO NAME

The IVIS is an exquisitely sensitive bench-top system and is capable of imaging both full spectrum fluorescence and bioluminescence. The system is equipped with 26 filters that can be used to image

reporters that emit from green to near-infrared. Superior spectral unmixing can be achieved by Lumina III's high resolution short cut off filters. An adjustable field of view from 5 – 12.5 cm and an optional 24 cm lens allows imaging of up to 5 mice or 2 medium size rats or zoom lens capability increasing the resolution to 35 μm at a field of view of 2.5 cm. The Lumina Series III can also accommodate petri dishes or micro-titer plates for in vitro imaging. (http://www.perkinelmer.com/CMSResources/Images/44-151071BRO_010795_01_PRD_LuminaIII.pdf)

Nikon A1R:

“GEORDI”

The A1R is Nikon's powerful fully-automated confocal imaging system, capable of capturing high-quality confocal images of cells and molecular events at high speed and enhanced sensitivity. Ideal for facilities with a broad range of users, the A1R has been designed with groundbreaking new optical and electronic technology innovations to provide unprecedented system quality and flexibility. The Nikon A1R is also fitted with multispectral detector that allows users to performing emission fingerprinting. The ability to separate emission based on spectral properties rather than through band-pass filtering significantly enhances the capability of the system to distinguish highly overlapped spectra, and therefore greatly increases the number of fluorophores that can be simultaneously used in a given specimen. In addition, it will also allow users to very specifically eliminate tissue autofluorescence without compromising the intensity of the actual fluorescence staining.

2-photon microscope:

NO NAME

Through the James Pendleton Trust we received funds to purchase our own 2-photon microscope for imaging within our facilities. 2-photon microscopy is a technological advance that allows for deep tissue imaging of up to 500 μm below the surface of the tissue. This is critical in experiments involving intravital imaging of living tissue or animals. The microscope is able to perform live cell imaging with two colors and take z-series stacks through the tissue. An isoflurane anesthesia system is available adjacent to the microscope for intravital imaging.

IX81 Olympus base:

“FRANK”

The IX81 microscope is an amalgam of microscopy equipment. The system includes 3 cameras, a coolsnap, qiclick ccd color camera, and a Nuance FX multispectral imaging camera. The stage, filters, and polychroics are all fully automated. The system is designed to incorporate a microinjection tool and digital diaphragm for FRAP. The system utilizes MetaMorph as the imaging platform.