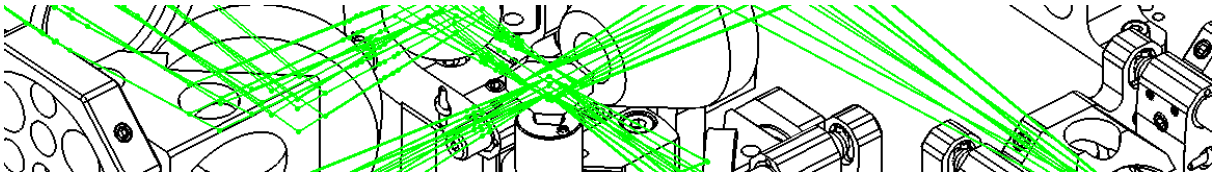
VisiTech international
Vision Technology for Science

VT-iSIM – Imaging Beyond All Limits

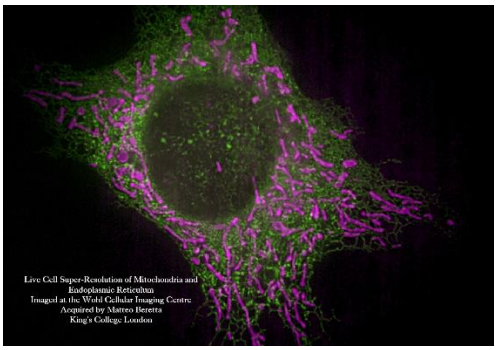
Introducing the world's first high speed super resolution imaging system



With VT-iSIM, the ground breaking, high-speed, super-resolution imaging system from VisiTech International, you can image at spatial and temporal resolutions never thought possible before.

With no requirement to use specific fluorophores and without any computation.

This allows the VT-iSIM to produce super resolution images in real time at up to 1,000 frames per second, and with 2x the resolution (on all axis) of regular confocal microscopy.



Highlights

- Increase spatial resolution on all axis by up to 2x offering lateral resolutions down to 100nm and axial resolution below 300nm*
- Image at speeds previously unobtainable in super resolution microscopy:
  200fps @ 97.5 x 71.5µm*
  1000fps @ 97.5 x 12.5µm*
  *FOV@100x Magnification
- VT-iSIM uses multi-point confocal scanning to generate super resolution images, hence low photo-bleaching, ability to image thicker samples such as tissue sections or whole animals and no specific fluorophores are required
- System also has no requirement for intermediary mag, therefore 100x = 100x

Upgrade your existing microscope

The VT-iSIM also offers a unique solution for adding super resolution microscopy to your lab.

VT-iSIM can be added to any regular Epi-fluorescent microscope (upright or inverted) to enable a cost effective path into high speed super resolution imaging.

The upgrade can be performed on site and we can also offer several unique software platforms.

To learn more about VT-iSIM please use the contact details shown below.

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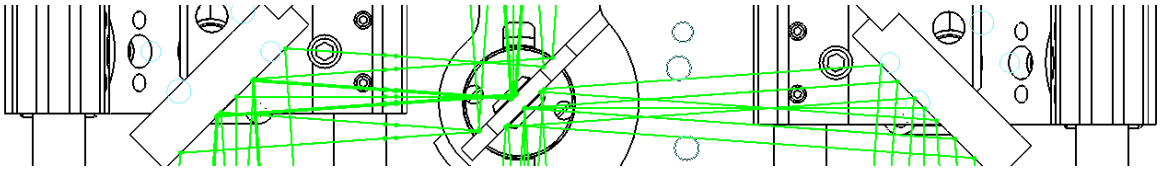
Bring your Epi-Fluorescent microscope into the world of super resolution microscope



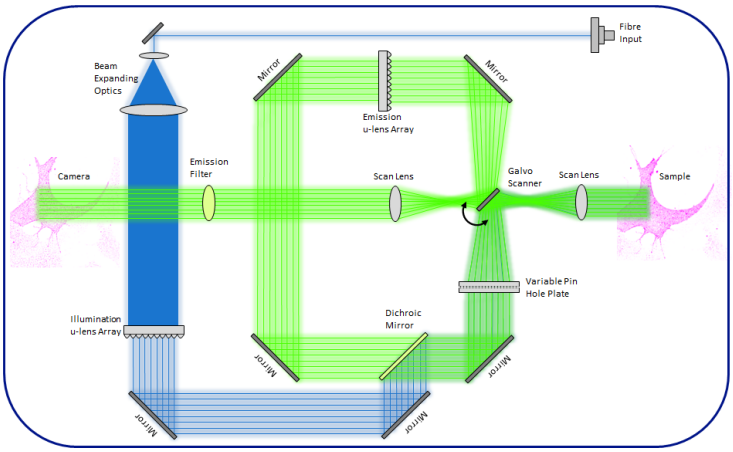


Figure 1 – VT-iSIM Optical Path

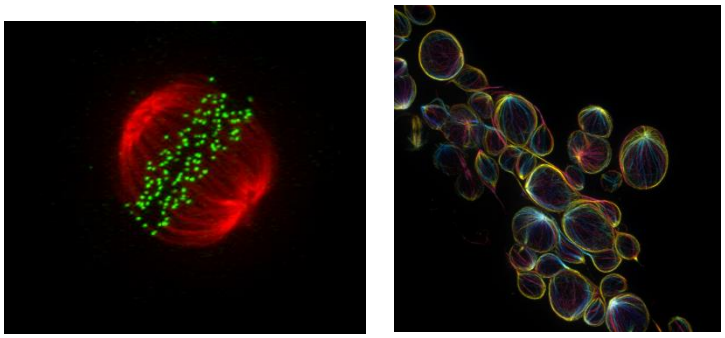


Figure 2 – VT-iSIM Sample Images

The Technology behind VT-iSIM:

The optical resolution of a confocal microscope is the product of the illumination and detection PSF's according to equation:

$$PSF_{conf} = PSF_{ill} \cdot PSF_{det} = PSF_{exc} \cdot (PSF_{em} \otimes PH(d))$$

Therefore, by setting the PH to be infinitely small we would get the best resolution as the effective PSF would just be the product of the excitation and emission PSF's, however this is not practical.

If we displace the detection PH by a distance X then as the PSF_{eff} is a product of the PSF_{ill} and PSF_{det}, it would be shifted but narrower. As the overlap decreases with increased displacement the width of PSF_{eff} decreases, and if an emitter is imaged through the displaced PH the likelihood that it will be more precisely localised increases.

Since a PH displaced by X collects an image displaced by X/2 you can shift the signal back to where it belongs. Therefore, summing all the signals from all the back shifted PH positions yields a super resolution image.

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For more information contact (Europe):

VisiTech International Ltd
Unit 92, Silverbriar
Sunderland, SR5 2TQ, U.K.
Tel: +44 191 5166 255
Fax: +44 191 5166 258
email: sales@visitech.co.uk
web: www.visitech.co.uk

For more information contact (US):

BioVision Technologies
64 East Uwchlan Ave. #273
Exton, PA 19341-1203
Tel: +1 610 524 9740
Fax: +1 610 524 9742
email: info@biovis.com
web: www.biovis.com

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