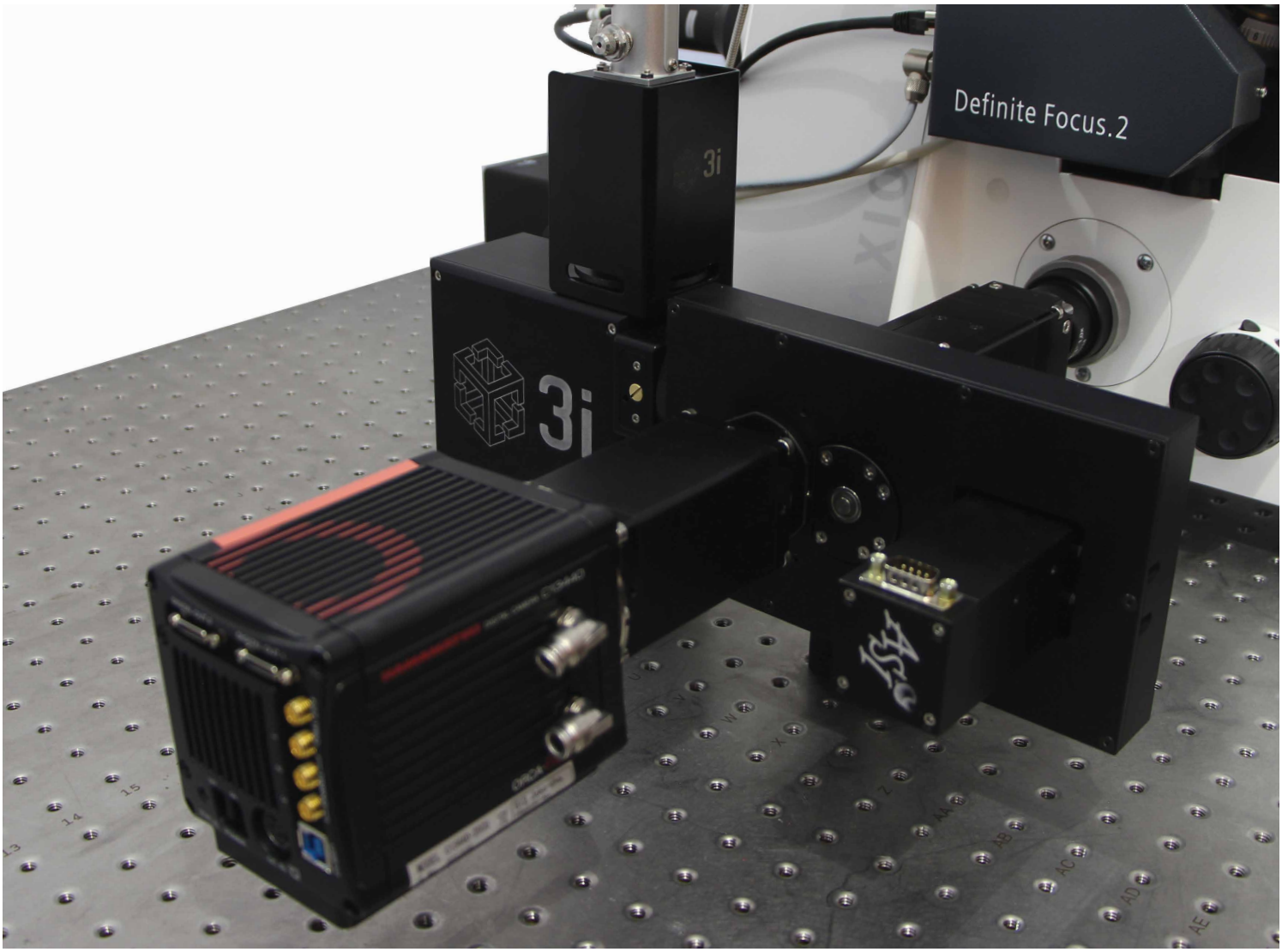
VectorTIRF

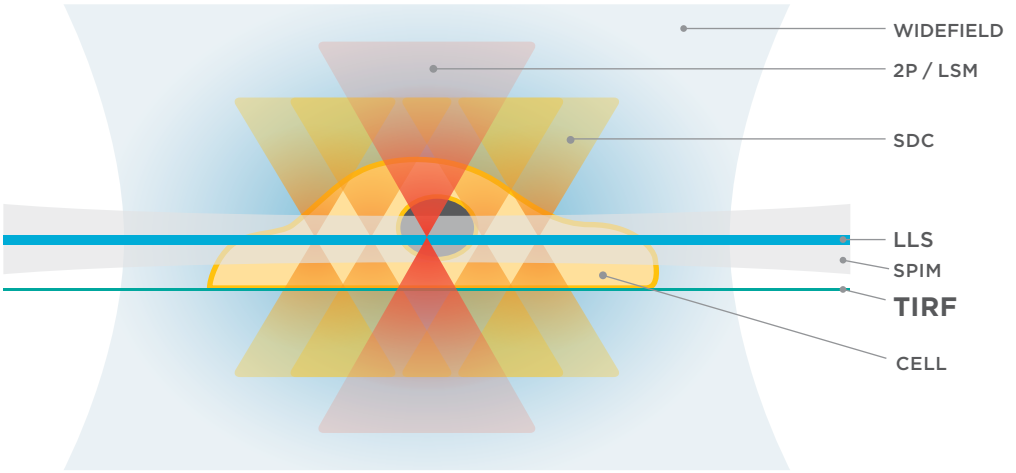


Motorized spinning X,Y TIRF system for even TIRF illumination

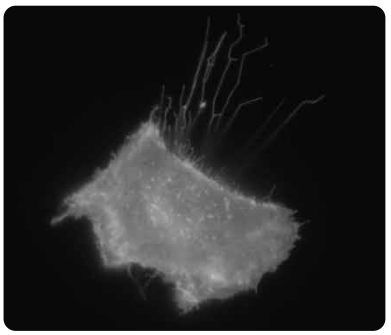
Fluorescence microscopy is a balance between light dose, resolution, signal-to-noise, and field of view. Total Internal Reflection Fluorescence (TIRF) microscopy uses an evanescent wave of energy immediately adjacent to the coverslip to excite fluorophores in the specimen. The excitation occurs about 100nm from the coverslip, which is perfect for imaging live cell focal adhesions, membrane dynamics, and receptor function in addition to single-molecule live cell in vitro imaging. TIRF requires placing a narrowly focused beam at the edge of the back aperture of an objective with NA greater than 1.38, and typically has some shadowing and direction-related artifact in the resulting evanescent wave illumination. Spinning the beam via galvo mirrors around the periphery of the back aperture at high speed averages out any artifacts and results in smooth, evenly illuminated images.

Why TIRF?

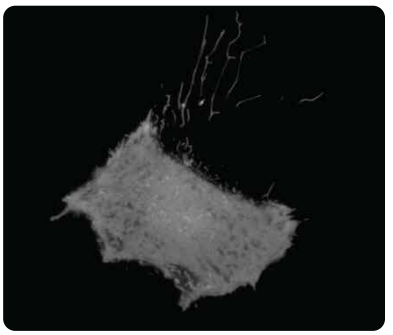
TIRF microscopy creates an evanescent wave that is about 100nm thick above the coverslip leading to a very thin plane of excitation, even when compared to lightsheet microscopy. This allows scientists to image events on the glass surface with essentially no background when compared to traditional widefield imaging.



Epi illumination

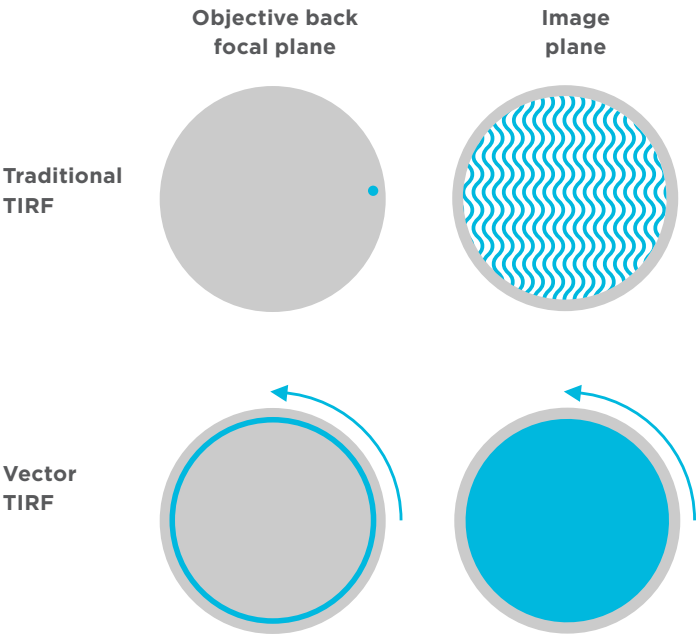


TIRF

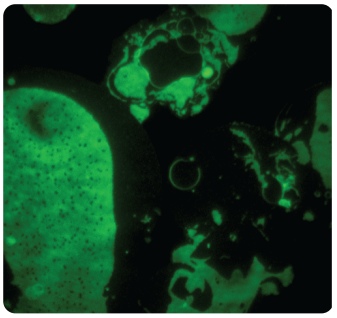


SPINNING ILLUMINATION FOR EVEN TIRF IMAGING

VectorTIRF allows for TIRF imaging with high speed and unrivaled clarity on a comparatively large, evenly illuminated field via spinning the excitation light around the back aperture. Spinning of the excitation light leads to more uniform imaging of thin samples without shadowing and polarization artifacts, as seen in the diagram on the left. VectorTIRF can be used for a variety of live-cell, in vitro, and even single molecule imaging when combined with a modern sCMOS or EMCCD detector. The flexibility of VectorTIRF allows integration with all research inverted microscope frames.



Fixed Position TIRF



Vector TIRF

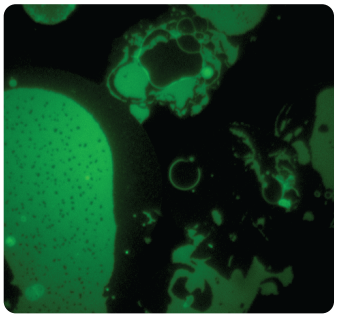
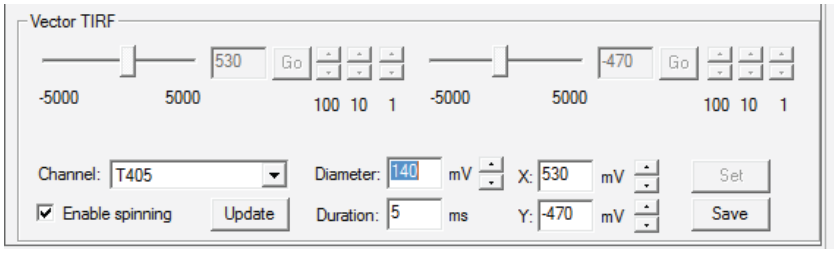


Image courtesy of Dr. Emmanuel Derivery, University of Geneva, Dr.Gonzalez-Gaitan lab) and Dr. Nicolas Chiaruttini, University of Geneva.

SlideBook

- Controls for spinning or fixed point illumination
- Easy control of X/Y centering, spin diameter, and spin duration
- Seamless integration into all SlideBook capture modes
- Ability to do single diameter, simultaneous multi-color excitation



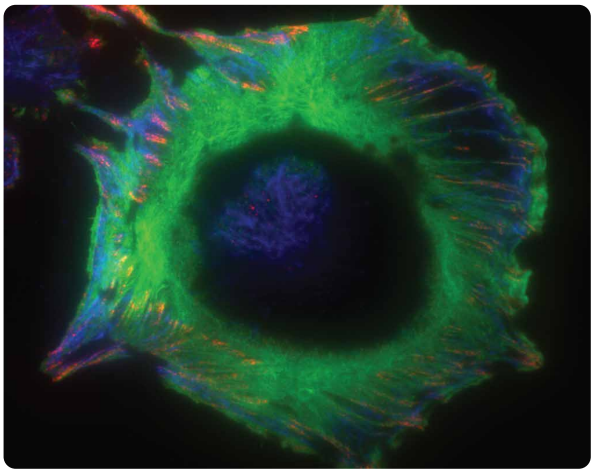
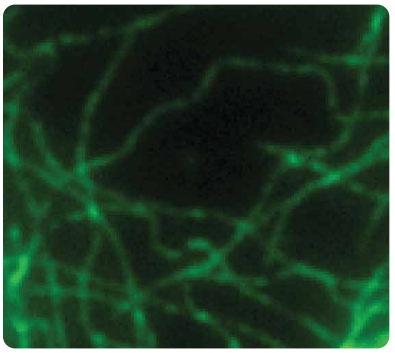
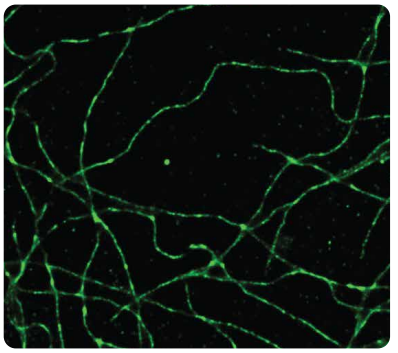


Image courtesy of Chris Bakal and Oliver Inge at the Institute of Cancer Research in London

SUPER RESOLUTION IMAGING



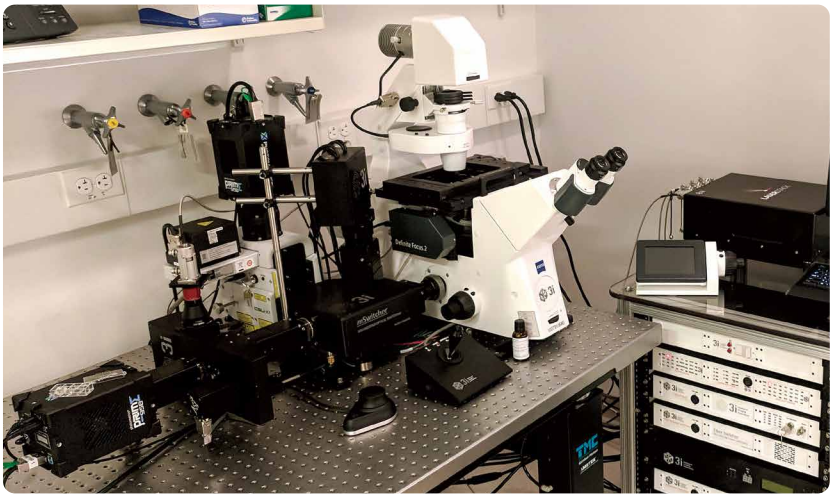


Images courtesy of Chris de Grafferreid at Brown University

Standard VectorTIRF (left) and thunderSTORM reconstruction (right) of Alexa647-labeled microtubles in COS7 cells.

- Up to 200mW lasers
- Fiji direct import of SlideBook .sld files

MARIANAS MULTIMODAL PLATFORM



Combine VectorTIRF with spinning disk confocal, photoactivation, and/or ablation systems for incredible flexibility on one system. Seamless control and switching achieved via SlideBook.

Specifications

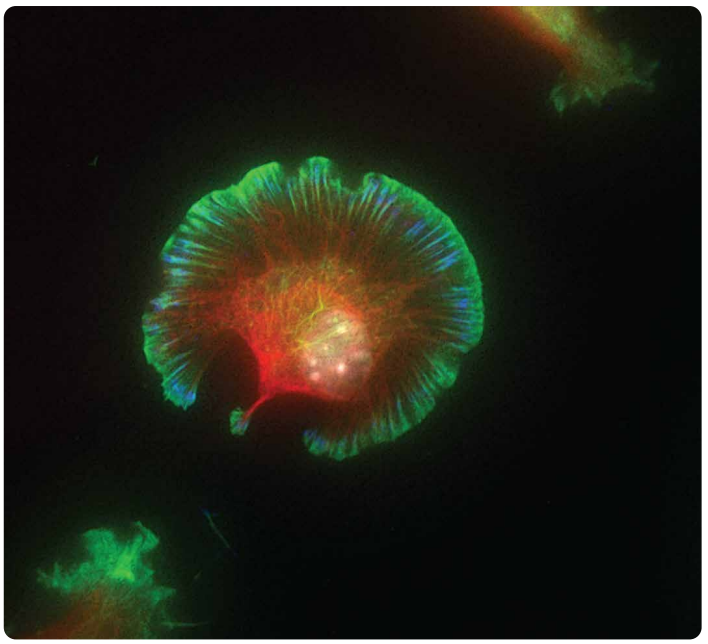
LASERSTACK LINES: 405nm, 445nm, 488nm, 515nm, 561nm, 594nm, 640nm

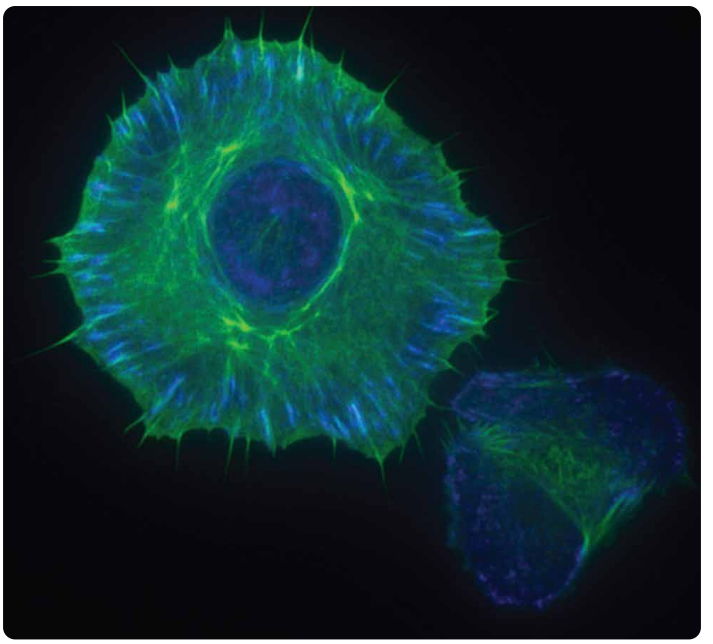
ILLUMINATION FIELD: 10 mm with variable beam expansion for fine tuning of excitation power

SOFTWARE: SlideBook software for image acquisition and analysis

COMPATIBILITY: Mounts to the sideport on Zeiss, Nikon, Olympus, and Leica inverted microscopes

FLEXIBILITY: Polarization input adapter for imaging with two orthogonal polarized input beams





F-actin, tubulin, and paxillinin human melanoma cells visualized by VectorTIRF. Image courtesy of Chris Bakal and Oliver Inge at the Institute of Cancer Research in London.

3i Intelligent Imaging Innovations

BUILT BY SCIENTISTS FOR SCIENTISTS. Intelligent Imaging Innovations (3i) designs and manufactures cutting edge live cell and intravital microscopy imaging platforms driven by 64-bit SlideBook software. 3i was established in 1995 by a group of scientists whose wide range of research activities includes cell biology, immunology, neuroscience and computer science. Our collective aim is to provide advanced multi-dimensional microscopy platforms that are intuitive to use, modular in design, and meet the evolving needs of investigators in the biological research community.

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