

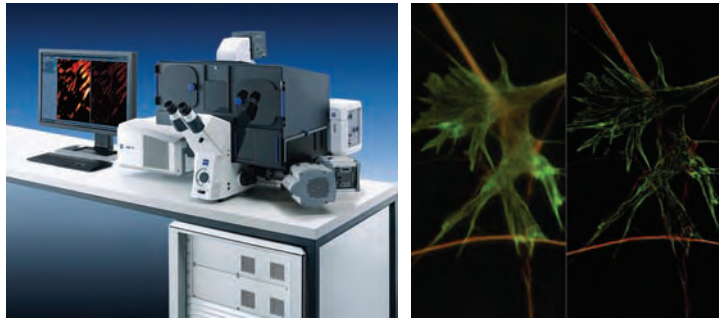
## Carl Zeiss introduces Superresolution Microscope Systems

The Carl Zeiss ELYRA microscope systems introduce two discrete superresolution techniques to optical microscopy for the first time. Structured Illumination Microscopy (SIM), developed by scientists at the University of San Francisco, and Photoactivated Localisation Microscopy (PAL-M) each offer extraordinarily high resolutions that overcome the classical diffraction limit to microscopic resolution.

Compared to conventional microscopy, superresolution images have up to double the resolution in all three spatial directions, down to less than 200 nanometers. The ability to resolve to this level within the living cell opens up original experimental possibilities, especially in cell biology and neurological research.

PAL-M technology offers the highest resolution currently available while the outstanding feature of SR-SIM technology is its high level of flexibility in the choice of dye. This means that both superresolution methods minimise previous limitations in dye selection or user-friendliness and that users no longer need to invest in single extremely specialised and expensive systems.

Three microscope systems are being offered. ELYRA S.1 is the first microscope system to offer SR-SIM technology on a standard microscope stand while ELYRA P.1 offers PAL-M technology commercially for the first time. The ELYRA PS.1 offers both technologies in one system and in combination



Photograph on right: Neuronal growth cone with widefield microscopy (left) and SR-SIM, staining for tubulin (red) and F-actin (green). Specimen: M Fritz and M Bastmeyer, University of Karlsruhe (TH), Germany.

with a laser scanning microscope, meaning that that an object can be successively imaged with LSM, SR-SIM and PAL-M.

For more information [E. micro@zeiss.co.uk](mailto:E.micro@zeiss.co.uk)

## High performance objectives optimised for live cell imaging

Nikon has launched its latest high performance, high numerical aperture (NA) objectives for use in biological applications. Featuring the highest ever NAs for water immersion objectives (1.27 and 1.25), these new objectives employ Nikon's unique, ultra low refractive index nano crystal coat, and are optimised for live cell imaging, providing the highest transmission at a broad range of wavelengths. This results in high contrast image acquisition, with faster image capture times at lower excitation levels, achieving less photobleaching and minimising damage to live cells, allowing longer-term observation. Comprising the CFI Plan Apo IR 60XWI and Lambda S series – CFI Apo 40XWILS, CFI Apo 60XHLAS and CFI Apo LWD 40XWILS, the new objectives feature high optical performance across the widest spectral wavelength with high chromatic corrections for sharp contrast imaging.

Nikon's nano crystal coating technology employs multiple layers of extra low refractive index nano particles that virtually eliminate internal lens element reflections across a wide range of wavelengths extending from the ultraviolet to the near-infrared. It is particularly effective in reducing stray light reflections and flare in high angle (large NA) lenses.

For further information Tel. +44 (0)208 247 1718, [E. info@nikoninstruments.eu](mailto:E.info@nikoninstruments.eu), [www.nikoninstruments.eu/Optics-Objectives](http://www.nikoninstruments.eu/Optics-Objectives)



## Cool camera for high definition

The DS-Fi1c is the latest addition to Nikon's Digital Sight series of cameras. Featuring a high definition cooled colour camera head and the latest optical technology, the DS-Fi1c is ideal for both brightfield and fluorescence applications as well as sensitive samples. An optimal microscopic digital imaging system can be configured for any bioscience or industrial application, from documentation to advanced image processing and analysis.

The DS-Fi1c uses a Peltier cooling mechanism to cool the CCD to 20°C below the ambient temperature. When capturing fluorescence images where long exposures are required, thermal background noise is suppressed, enabling capture of high contrast images. With a high dynamic range, low noise and high frame rate, the DS-Fi1c offers high performance under short and longer exposure times, and is suitable for sensitive samples across a wide variety of applications including fluorescence, brightfield, phase contrast and differential interference contrast (DIC). The high definition 5.0-megapixel CCD produces better fluorescence images.



For further information T. +44 (0)208 247 1718, [E. info@nikoninstruments.eu](mailto:E.info@nikoninstruments.eu), [www.nikoninstruments.eu/Cameras/Digital-Cameras/DS-Fi1c](http://www.nikoninstruments.eu/Cameras/Digital-Cameras/DS-Fi1c)

## Elekta's Extend receives FDA 510(K) clearance

At the 2009 Congress of Neurological Surgeons (CNS) Annual Meeting in New Orleans, Louisiana, Elekta demonstrated how its line of stereotactic solutions expand treatment capabilities and bring new hope for patients presenting serious conditions. Topping the list of innovations is Extend™, a stereotactic treatment programme that lets clinicians apply the power and precision of Gamma Knife® surgery to a broader class of targets, including certain cancers of the head and neck. Including a re-locatable frame and



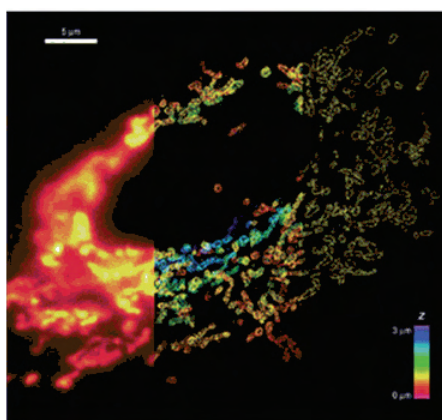
support for fractionated treatments, Extend provides cross functional advantages in both SRS and SRT for both neurosurgeons and radiation oncologists. Extend for Leksell Gamma Knife® Perfexion™ has received 510(k) clearance from the US Food and Drug Administration (FDA) and is now available in the United States.

For more information see [www.elekta.com](http://www.elekta.com)

## N-STORM microscopes will enhance resolution 10-fold

Nikon Corporation has signed a licensing agreement with Harvard University granting Nikon the rights to use the Stochastic Optical Reconstruction Microscopy (STORM) technology. Nikon will manufacture STORM enabled microscopy systems, designed to realise resolution higher than ever before achieved by conventional optical microscopes, and market them with the N-STORM name.

Enabling clearer observation of tissues and cells, STORM technology is an advanced form of optical microscopy – one of the most widely used imaging methods in biomedical research. However, the spatial resolution of optical microscopy, classically limited by the diffraction of light to several hundred nanometres, is substantially larger than typical molecular length scales in cells, leaving many biological investigations beyond the reach of light microscopy. To overcome this limit, a new form of high resolution light microscopy, STORM, was developed. STORM uses photo-switchable fluorescent probes to temporally separate the otherwise spatially overlapping images of individual molecules, allowing the construction of super resolution images. Using this concept,



Comparison of conventional and STORM images of mitochondria in a mammalian cell. The mitochondrial outer membrane protein Tom20 was labelled. (Left panel) Conventional image of the left part of the cell. (Middle panel) 3D STORM image of the middle part of the cell. The z-dimension information is colour-coded according to the colour scale bar. (Right panel) The xy-cross-section of the STORM image of the right part of the cell. Image courtesy of Zhuang Research Group, Department of Chemistry and Chemical Biology, Harvard University, Cambridge MA.

two- and three-dimensional, multicolour fluorescence images of molecular complexes, cells and tissues with a few tens of nanometres resolution have been achieved. This new form of fluorescence microscopy allows molecular interactions in cells and cell-cell interactions in tissues to be imaged at the nanometre scale.

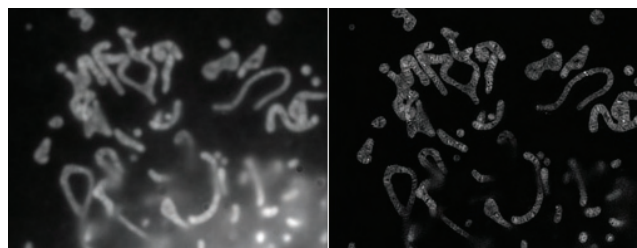
Providing resolution that is 10 times or better than that of conventional optical microscopes, N-STORM is based on the world renowned Nikon Eclipse Ti research inverted microscope. The system incorporates CFI60 objectives featuring high numerical apertures developed using unique optical design, coatings and manufacturing techniques. The N-STORM instrumentation will be capable of multi-spectral two-dimensional and three-dimensional nanoscopy, with lateral resolution to approximately 20nm and axial resolution to approximately 50nm, extending the role of the optical microscope to near molecular level resolution. The N-STORM Super Resolution microscope system will be available in May 2010.

For more information T. +44 (0)208 247 1718,  
E. [info@nikoninstruments.eu](mailto:info@nikoninstruments.eu), [www.nikoninstruments.eu/N-STORM-Super-Resolution](http://www.nikoninstruments.eu/N-STORM-Super-Resolution)

## Molecular scale resolution possible with N-SIM microscopy system

Nikon Corporation has signed an agreement with the University of California, San Francisco Office of Technology Management for Structured Illumination Microscopy (SIM) technology. Under the terms of the agreement, UCSF will license its technology to Nikon to make N-SIM enabled microscopes designed to realise resolution higher than can be achieved by conventional optical microscopes.

Optical microscopes are essential for the clear observation of tissues and cells in life science research. However, if multiple objects such as protein molecules cluster at distances of less than 200nm apart, conventional optical microscopes cannot identify them as single objects, necessitating the use of instrumentation such as electron microscopes. Nikon's super resolution fluorescence microscopy technology greatly exceeds the resolution limits of conventional optical microscopes,



Conventional microscope Mitochondria in a living NIH3T3 cell stained with MitoTracker Red Total magnification: 250x

making it possible to view microstructures and nanostructures of fixed and living cells with molecular-scale resolution.

Nikon's N-SIM microscopy system can produce two times the resolution of conventional optical microscopes by combining SIM technology licensed from UCSF and based on the world renowned Eclipse Ti research inverted microscope with Nikon's legendary CFI Apo TIRF 100x oil objective lens (N.A. 1.49), developed using unique optical technologies and manufacturing techniques. Nikon's official

name for the commercialised system is Super Resolution Microscope N-SIM, and it will be available in May 2010.

For further information contact T. +44 (0)208 247 1718,  
E. [info@nikoninstruments.eu](mailto:info@nikoninstruments.eu), [www.nikoninstruments.eu/N-SIM-Super-Resolution](http://www.nikoninstruments.eu/N-SIM-Super-Resolution)

## Lumenera Corporation appoints Vision Source as distributors

Vision Source, an established company with a record in digital imaging solutions for microscopists, is pleased to announce their exclusive appointment by the Lumenera Corporation to sell and support their range of digital camera systems.

As a global market leader, Lumenera provides an extensive range of high quality digital cameras with unique combinations of speed, resolution and sensitivity to satisfy the demands of today's imaging applications. Lumenera also offers custom design services to OEM partners requiring specialised hardware and software features.

Lumenera's INFINITY USB 2.0 digital cameras offer 1.3 to 32 megapixel resolution and are specifically designed for life science, clinical or industrial applications. Every

camera includes INFINITY ANALYZE software for advanced camera control, image processing, measuring and annotation, as well as INFINITY CAPTURE, an intuitive user interface which includes all of the basic features needed to control your INFINITY camera and capture images.

Vision Source will carry stocks of INFINITY cameras which they will happily demonstrate to potential users.

For more information Contact  
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## Reinventing cranial fixation with the Neos Cranial Loop™

The NEOS Cranial LOOP™, the latest product from NEOS Surgery® is the first-ever cranial fixation device made entirely of PEEK-OPTIMA®, the advanced biocompatible polymer from Invibio Biomaterial Solutions. NEOS' innovative design harnesses PEEK-OPTIMA's unique combination of mechanical characteristics and performance properties to realise significant surgeon/patient benefits beyond the range of metallic biomaterials. The result of extensive research and development, the Cranial LOOP is a game-changing addition to NEOS' line of innovative cranial fixation devices.

The instrument-free design is made possible by PEEK-OPTIMA material characteristics (including high elastic modulus, high tensile strength, and highly radiolucent CT/MRI imaging without scattering or artifacts) and incorporates a

self-cutting function for removing the non-implantable part of the device. A fast and easy "pull and tighten" action allows the surgeon to control and feel the fixation; a standard bone flap with three Cranial LOOPS can be fixated in less than a minute. The NEOS Cranial LOOP produces fixation strengths similar to those of other standard metallic, non instrument-free fixation devices. Its unique design and materials allow it to perfectly adapt to the epicranial and subcranial shape and curvature.

The benefits and efficacy of the Cranial LOOP have been demonstrated by widespread commercial success across Europe.

For more information contact NEOS Surgery at T. +34 935 944 726 (Barcelona, Spain), E. [info@neosurgery.com](mailto:info@neosurgery.com), [www.neosurgery.com](http://www.neosurgery.com)



Neos Surgery Cranial LOOP Fixation.

## Eisai launches once-daily anti-epileptic, Zebinix®

Eisai has launched the once-daily anti-epileptic Zebinix® (eslicarbazepine acetate) in the UK as adjunctive therapy in adults with partial-onset seizures, with or without secondary generalisation. Zebinix (eslicarbazepine acetate) has been developed from the 40-year-old, 'gold standard' treatment, carbamazepine, but with significant changes to avoid formation of the epoxide metabolite associated with neurological side effects.

Pooled analysis of three phase III trials (1,049 adult patients with partial onset seizures; 800mg median daily dose) showed a 35% reduction in seizure frequency and a 36% responder rate for patients achieving at least a 50% reduction in seizure frequency.



Patients who then went on to one-year open label extension studies continued to take eslicarbazepine acetate with retention rates ranging from 68-79% at one year. Side effects were mostly described as mild to moderate and most commonly included dizziness, headache, drowsiness and nausea.

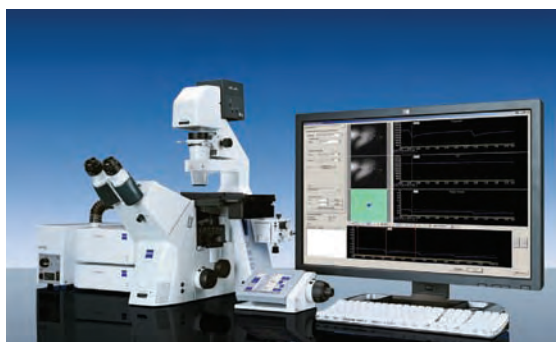
Patients reported improvements in health-related quality of life measures such as 'seizure worry' and 'cognitive function' as well as improvement in the depressive symptoms often reported by patients with poorly controlled epilepsy.

For more information E. [Imedinfo@eisai.net](mailto:Imedinfo@eisai.net), T. +44 (0)20 8600 1400.

## Carl Zeiss advances the study of highly dynamic processes within cells

Much of our understanding of the structural organisation of the living cell has come about through recent advances in fluorescence-labelling of target molecules and laser scanning microscopy. With the release of DirectFRAP from Carl Zeiss, scientists can now make similar strides in probing the dynamics of membrane transport and the movement of molecules within the living cell.

FRAP, FLIP, photoactivation, conversion of Dendra, on-off switching of Dronpa and other photomanipulation techniques, use a combination of intense pulses of laser light and widefield epi-fluorescence observation to measure the movement of fluorescent markers within the cell. Fitted to the Carl Zeiss Axio Observer microscope, DirectFRAP overcomes the dynamic compromises inherent in previous systems by eliminating the link between laser intensity and the size of the ROI, allowing simultaneous photo-manipulation across the entire area and first image acquisition in as little as two milliseconds. The precise millisecond control of the laser pulses is



achieved by acousto-optic tuneable filters (AOTFs) and the system is notable for its brilliant image formation at high acquisition rates and a wide observation field in fast experiments.

Flexible diaphragm options enable a high level of flexibility during experiments and DirectFRAP has been designed to be used in combination with other Carl Zeiss imaging systems, such as the Laser TIRF 3 or Cell Observer SD (Spinning Disc). These system combinations permit the observation of processes in a single Z plane and are ideal for the examination of the smallest cell structures. The same

lasers can be used simultaneously for DirectFRAP and Laser TIRF 3 or Cell Observer SD. With all systems, laser pulse control and data acquisition is performed by the ZEISS AxioVision software.

For further information E. [micro@zeiss.co.uk](mailto:micro@zeiss.co.uk)

