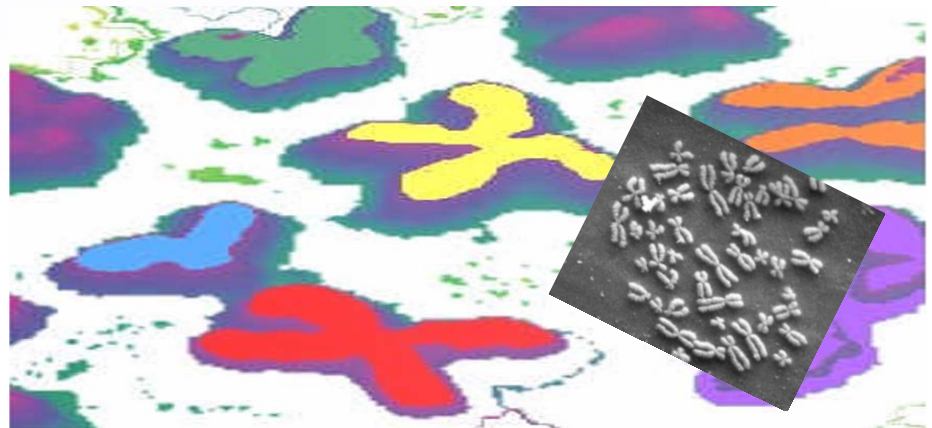


Genikon is a complete solution primed for use in the routine and research cytogenetic

Introduction

Bringing clarity to cytogenetic analysis, Genikon is an intuitively simple-to-use system that helps to unravel the complexities of the genome. Invented by cytogeneticists, Genikon allows manual and automated karyotyping, fluorescence in situ hybridisation (FISH), multicolour fluorescence in situ hybridisation (mFISH) and comparative genomic hybridisation (CGH) analysis. In addition, the extremely flexible archiving and database strategy allows this system to be used in a true networking environment.



The Genikon workstation is configured around Nikon's Eclipse range of microscopes equipped with CFI60 infinity optics. Outstanding optical technology and capability for low light fluorescence imaging provide the image clarity needed for detailed analysis. The CFI60 optics will ensure the user to have the best in optical quality, since it combines the highest resolution with the highest transmission efficiencies and longest working distances.

The workstation can be configured to suit all needs and budgets, as the software packages are modular and interlaced. This modular design allows researchers to incorporate upgrades as and when they occur - keeping them fully up to date with the latest techniques.

Unique Features

One graphical user interface for all modules

All Genikon modules operate using a similar interface and identical (patient) database. Upgrading the Genikon system with an additional module does not require any change of the existing database. The Genikon software is currently available in different languages (German, English, French, Italian).

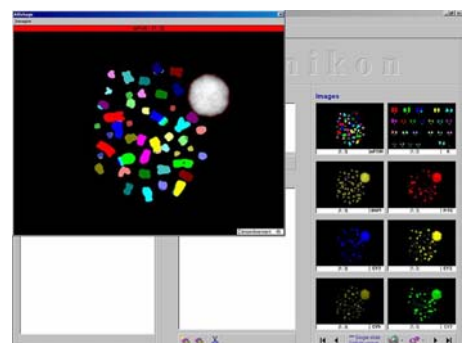
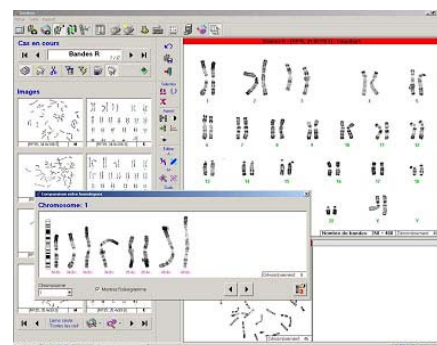
Flexible hardware configuration

Genikon software allows the integration of different hardware components. The system may be combined with any manual microscope or motorized microscope (e.g. Nikon Eclipse 90i fully motorized microscope). Additionally, a wide choice of imaging devices is proposed, such as (monochrome) video camera's, high resolution digital camera's and cooled camera's. Finally, different manual and motorized filter units can be controlled by the Genikon software.

The Genikon database can be searched for patient parameters (such as name, patient ID etc.) and any other search criteria. The accessible archive reveals stored raw data, metaphase spreads, karyotypes, FISH images, CGH images, and M-FISH data. Images can be saved in different file formats such as TIFF, JPG and BMP and can be printed with or without patient details. The database can be configured around a true network and allows to move or back-up data to CD, DVD, optical disks, external (hard)disks etc, while conserving the localisation of the data.

The patient database is completely integrated

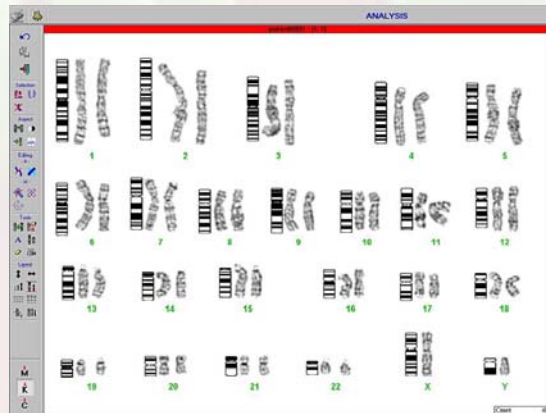
At the heart of the Genikon software exists the patient database (archive). The database can be designed to the exact wishes of the laboratory and provides prefab (user adjustable) print reports based around the database fields.



GENIKON CYTOGENETIC SOLUTIONS

Karyotyping

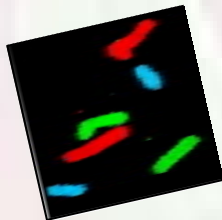
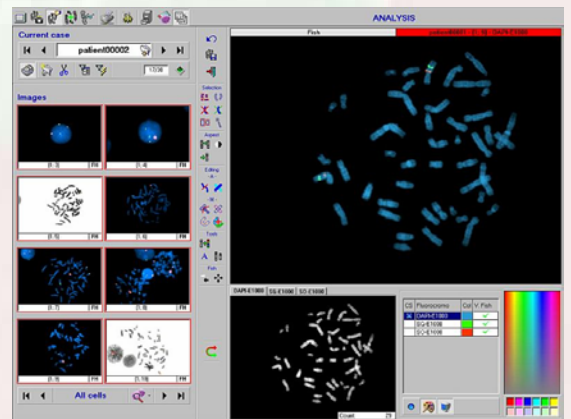
With a capacity for manual and automatic karyotyping (R, Q, and G bands), Genikon makes sense of the tangle of chromosomes from a metaphase spread. The karyotyping software module separates single or multiple overlapping chromosomes, aligns centromeres, and rotates chromosomes for easy quantification and ideogram comparison. Chromosome edges can be sharpened using an eraser tool and chromosomes may be zoomed up to 2X magnification. Contrast can be modified after acquisition using special filters, and annotations (text or arrows) can be added at any stage.



FISH

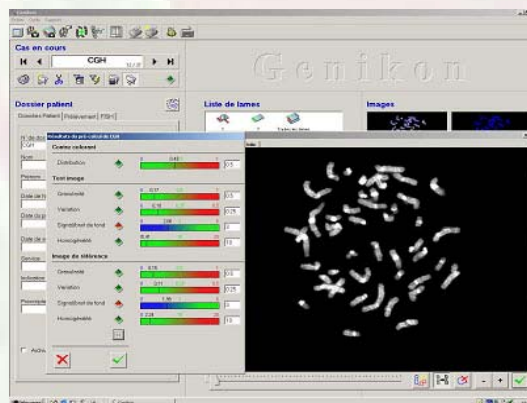
fluorescence in situ hybridisation

The Genikon FISH module enables both manual and automatic changing of filters and filter cubes. The system memorises the offset, integration time and assigned colour for every fluorochrome/filter combination, as well as automatically correcting pixel shifts allowing the user to create a personalised fluorochrome/filter list for consistent image acquisition. Genikon also combines fluorescent and brightfield images.



mFISH

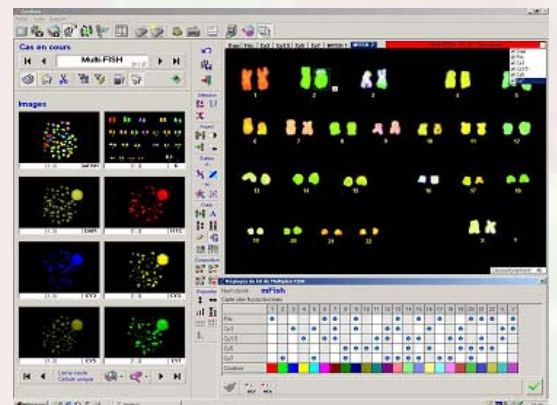
multicolour fluorescence in situ hybridisation High definition colour analysis helps researchers identify complex chromosomal rearrangements. Pseudo colour allows easily distinguishable colours to be assigned to each probe. Inter-chromosomal rearrangements are easily identified as colour changes within an affected chromosome.



CGH

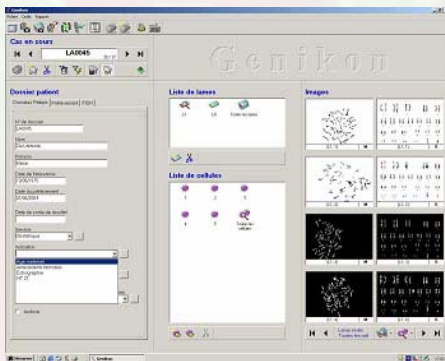
comparative genomic hybridisation

Genikon's high-resolution analysis allows researchers to screen tumour cells for characteristic DNA gains and losses that include mutations at chromosomal and subchromosomal levels.

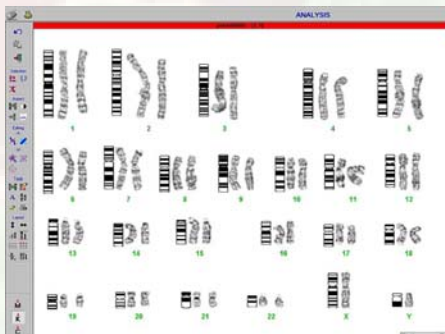


Caryotyping

- Manual and automatic control over integration, contrast and intensity
- Presentation of acquired images in gallery format
- No limitation of number of acquired images



- Automatic or manual counting before the caryotyping
- Band filters and contrast filters for individual chromosomes or metaphases
- Automatic counting of chromosomes
- Raw images are stored in combination with the adjusted images
- Automatic or manual separation of crossed or adjacent chromosomes
- Axes identification for separation of crossed chromosomes
- Automatic or manual construction of the caryotype;
- After caryotype construction,



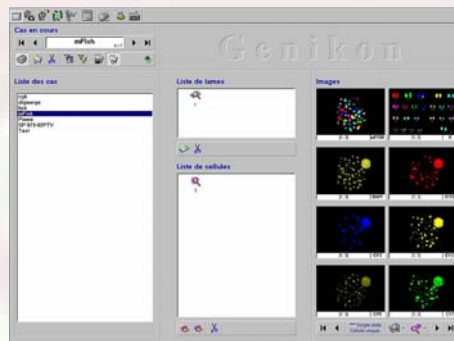
it is possible to translate, rotate or inverse wrongly positioned chromosomes

- Caryotype format and chromosome size adjustment
- Centromer alignment
- Printing of metaphases

- Printing of metaphases and caryotypes in a single report
- Idéograms (ISCN 1995) ;
- Combination of ideograms and chromosomes to identify abnormalities
- Automatic counting of chromosome bands
- Zoom function
- Automatic detection of focal plane (also for manual microscopes)
- High resolution camera integration

The FISH module

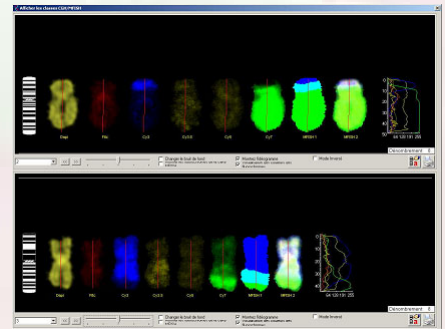
- Intuitive and userfriendly settings
- Possibility to store acquisition settings
- Storage of raw data
- Integration of analog or digital cameras (incl. cooled cameras)



- Autofocus
- Complete control over images
- Control over motorized microscope Nikon Eclipse 80i or 90i
- Merge of brightfield and fluorescence images
- Modification of colour palette is possible (both pre- and post-acquisition)
- Regions of interest selection
- Pixel shift correction

The Multi-FISH (M-FISH) module

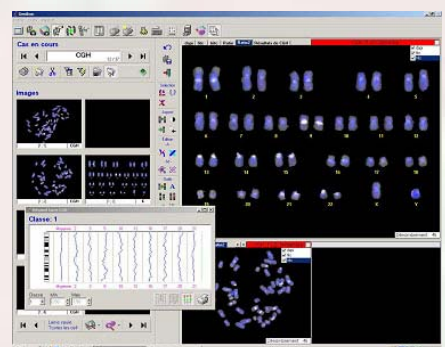
- Store images plane by plane
- Easy modification of colours



- Pixel shift correction
- User-defined regulation of fluorochrome colour combination
- Adjustable caryogram format
- Pre-acquisition visualisation
- Easy printing
- TIF and BMP file formats
- Integration of high resolution camera

The CGH module

- Control over image quality after acquisition
- Invert DAPI image, composite and ratio image
- Gallery type of image visualisation
- Pixel shift correction
- Similar usage as caryotyping
- Automatic profile visualisation
- Average of multiple caryograms
- Incorporation of ideograms
- Automatic visualisation of gains and losses
- Integration of high resolution camera



GENIKON CYTOGENETIC SOLUTIONS

Introduction

The Nikon Eclipse 80i is a culmination of Nikon's breakthroughs in optical technologies and precision engineering. With an array of powerful optics, this system not only ensures uniform brightness over the whole view field, it also achieves superb resolution to the peripheries. These remarkable achievements take digital imaging to new heights. Epi-fluorescence microscopy featuring unparalleled S/N ratios and DIC imaging with an exceptional excellent balance between resolution and contrast is now a reality. The groundbreaking digital imaging head can also even read and utilize the microscope's setting data from a connected PC or dedicated digital camera. That's not all! An operating platform that is ergonomic and easy to manipulate has been incorporated into the Eclipse i-series, including a stay-in-position stage handle and tilting eyepiece tube whose length and inclination angle can be adjusted to suit each operator. A model with a centerable and rotating stage that is especially useful for pathology documentation trimming procedures and research level DIC observations is also available.

Unique Features

The feature-packed Nikon Eclipse 80i is the perfect platform for digital imaging in any laboratory or research situation.

- Built-in fly-eye optics ensures provides ultra uniform illumination-perfect for digital imaging.
- New Plan Apo VC objectives delivers crisp high-resolution images right to the edge of the field of view utilizing a broader illumination spectrum into 405 nm.
- The newly developed epi-fluorescence illuminator-the Hi S/N Fluorescence System-incorporates a unique "Noise Terminator" that delivers S/N ratios five times higher than our previous fluorescence system.
- A digital imaging head optimized for digital format image capture has been specially developed for the "i" series. It includes integrated reflected light illumination, dual image ports and an optical zoom lens able to produce images of excellent contrast and resolution.
- A solid construction ensures high-precision, stable focusing.



Highlights

"Hi S/N" Epi-fluorescence microscopy

All the Nikon Eclipse 80i-series optional epi-fluorescence illuminators come standard with Nikon's exclusive Noise Terminator. It works by eliminating the possibility of stray light that is generated in the fluorescence filter block; thus it produces high contrast images with greater S/N ratio when observing weakly fluorescing specimens. Used together with the new Plan Apo VC objectives, it is possible to obtain digital images that have excellent resolution throughout the view field, regardless of the magnification. The high precision filter changing system is a turret type holding up to six filter cubes, and it uses phosphorescent filter cube display tags to enhance their visibility during operation in dark rooms.

"Excitation balancer" continuously adjusts excitation light

The epi-fluorescence illuminator adopts a unique excitation balancer (patent pending). The spectral intensity of each excitation wavelength can be continuously adjusted by the sliding action of inserting or removing the excitation balancer from the light path, allowing the operator to easily emphasize the desired wavelength without changing the filter cubes, and making it especially convenient for observing and photographing multi-stained specimens.

Six-filter turret

The filter turret in the epi-fluorescence illuminator can accommodate six filter cubes, which are easily exchanged. The turret uses phosphorescent filter labels, making it easy to see the names and positions of filter cubes in darkened rooms.

Upgraded DIC performance

Uniform crisp images with high contrast and resolution. By using a new composition of the material in the DIC prism, it is now possible to obtain high-contrast images with excellent resolution and uniform coloration at any magnification. DIC imaging has also advanced to a new level. On the centerable stage model, it is possible to adjust the shade (3D effect) of the image by rotating the stage.

CFI60 infinity optics

Nikon's CFI60 infinity optics has received high acclaim in global markets for their superb image quality. This optical system combines the CF design with infinity optics, utilizing a

60mm parfocal distance for the objectives. The result: longer working distances and high N.A.'s, while producing images that are crisp and clear with high contrast and minimal flare. In addition, the CFI60 system provides a flexible upgrade path to accommodate various accessories to meet individual applications as well as a wide array of specialty objective lenses.

Solid construction enables high-precision focusing

Utilizing computer-aided engineering (CAE), Nikon has significantly increased the stability of the both stage 'Z' movement and that of the arm section compared with previous Eclipse models. The result is greater resistance to distortion under load, and vibrations, and temperature variations, thus reducing the chance of unwanted blur or image shifts that tend to occur during high magnification observations.

Built-in fly-eye optics ensure uniform illumination

A fly-eye field lens is incorporated in the 80i main body as standard to achieve highly uniform illumination. Reduction in light intensity at the peripheries of the view field is now a thing of the past. Digital images with uniform brightness from the center to the edges are always obtained at all magnifications, while totally filling the objective back aperture.

New Plan Apo VC objectives deliver high-resolution images right up to the edge

The new objectives have been specifically designed for digital imaging using CCD detector's. These objectives maximize the design advantage of the CFI60 optics to dramatically improve chromatic aberration and shading. It is now possible to obtain high contrast digital images with virtually no aberration throughout whole visible wavelength range including 405 nm over the whole view field.

CFI60 infinity optics

Nikon's CFI60 infinity optics has received high acclaim in global markets for their superb image quality. This optical system combines the CF design with infinity optics, utilizing a 60mm parfocal distance for the objectives. The result: longer working distances and high N.A.'s, while producing images that are crisp and clear with high contrast and minimal flare. In addition, the CFI60 system provides a flexible upgrade path to accommodate various accessories to meet individual applica-

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GENIKON CYTOGENETIC SOLUTIONS

Stay-in-position stage handle

The stage handle stays at the same position throughout the full range of X/Y stage movement. Because the stage handle and the fine focus knob are always situated close to each other, operation is easy and smooth, even when these controls need to be adjusted repeatedly. Also, since the stage handle is height and tension adjustable, it can be used with your fore arm and hand resting on the bench top. On the centerable stage model, it is possible to document the specimen at the desired stage rotation angle, improving composition and while enabling the contrast shading angle ϵ of the image to be changed freely during DIC microscopy. The durability of the stage has been improved as well, using "Alumite Technology" producing a super hard harder stage surface.

Ergonomic tube

The Siedentopf-type ergonomic eyepiece tube can be inclined at angles from 10° to 30° and the eyepieces can be extended up to 40mm. Also available are eye level risers that can raise the eyepoint height up 25mm at a time (a total of four risers can be mounted). This ensures an optimum eye level and comfortable viewing posture, regardless of the operator's physique or if intermediate modules have been attached, greatly reducing strain during long hours of observation. In addition, the optional DSC port with a 0.7X magnification permits the easy attachment of a digital camera to the ergonomic tube, enabling documentation in digital format. In this setup, the camera's focusing and centering functions can be utilized independently.

Nomarski DIC

The newly developed DIC method allows unstained specimens to be observed in 3D-relief-like images with outstanding contrast and sensitivity in the best balance by applying a new composition of the material for the as the DIC prism elements. With the Nikon DIC system, because it adopts the Senarmont method, you can comfortably fine-tune image contrast simply by rotating the polarizer located below the on the top of the condenser. Also, performance is optimized because the condenser DIC prism is perfectly matched to the condenser's top lens and objective side prism. Used together with the 80i's fly-eye digital imaging optics, it is possible to produce entirely uniform digital images with proper background color and intensity.

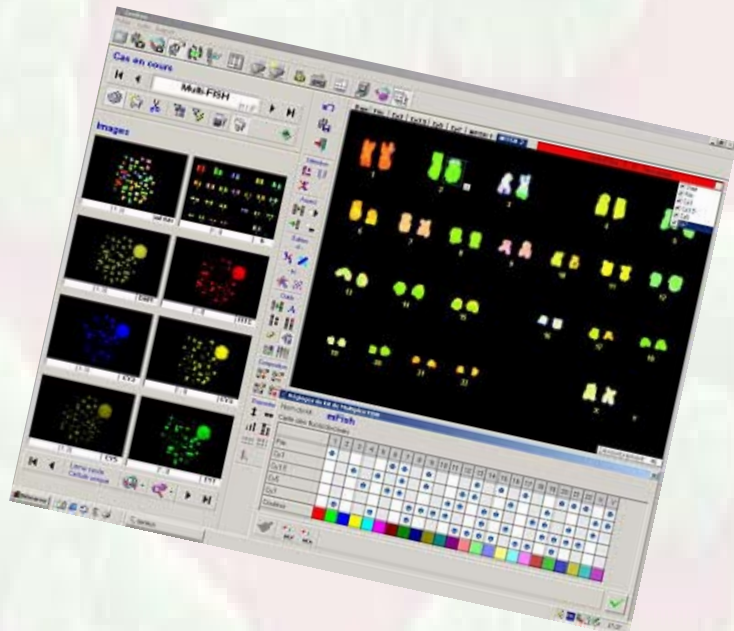
"Hi S/N" Epi-fluorescence/DIC microscopy

Use of DIC in combination with

epi-fluorescence illumination enables researchers to accurately locate fluorescent-tagged structures or proteins as well as visualize the cellular morphology within a specimen. Used in conjunction with the new Plan Apo VC objectives, digital imaging with the highest excellent resolution and aberration correction throughout the view field is possible., regardless of the magnification.

Phase contrast microscopy

Nikon has developed unique "Apodized Phase Contrast" objectives expressively for this technique. These objectives enable the detection of minute structures-previously difficult to detect due to annoying halos-with excellent contrast and a much wider tonal range. This is ideal for specimens with varied refractive indices



Alpha
Metrix

AlphaMetrix Biotech
GmbH

Paul Ehrlich Str. 28/G3
DE-63322 Rödermark

Telefon : +49 (0)6074 2116240
Fax : +49 (0)6074 2116241
Email : info@alphametrix.de

