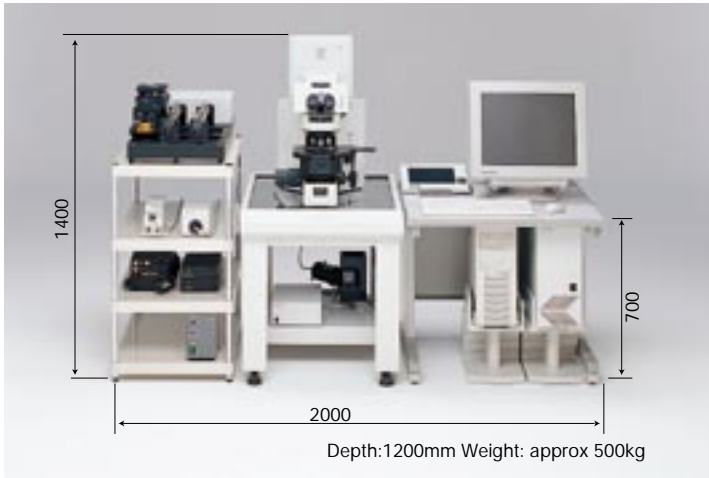
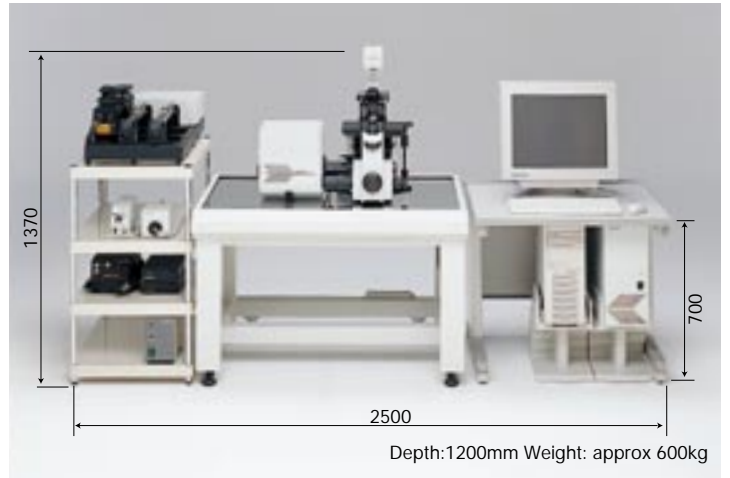


FV500-AX dimensions



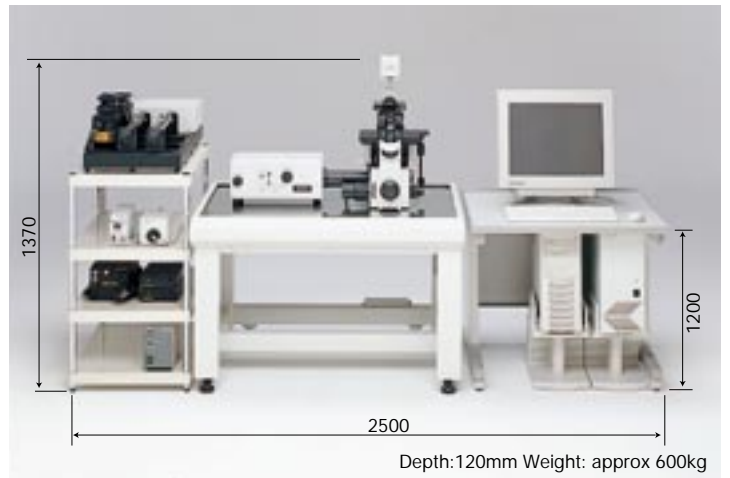
FV500-IX dimensions



FV300-BX dimensions



FV300-IX dimensions



## Superior all-round flexibility

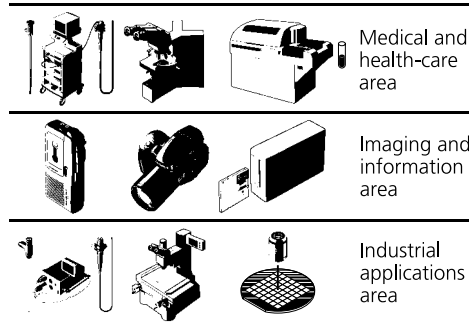


- All brands are trademarks or registered trademarks of their respective owners.
- Monitor images are simulated.

Specifications are subject to change without any obligation on the part of the manufacturer.



### Olympus business areas



# OLYMPUS®

FOCUS ON LIFE

**OLYMPUS OPTICAL CO., LTD.**  
2-43-2, Halagaya, Shibuya-ku, Tokyo, Japan  
**OLYMPUS OPTICAL CO. (EUROPA) GMBH.**  
Postfach 10 49 08, 20034, Hamburg, Germany  
**OLYMPUS AMERICA INC.**  
2 Corporate Center Drive, Melville, NY 11747-3157, U.S.A.  
**OLYMPUS SINGAPORE PTE LTD.**  
491B River Valley Road, #12-01/04 Valley Point Office Tower, Singapore 248373  
**OLYMPUS OPTICAL CO. (U.K.) LTD.**  
2-8 Honduras Street, London EC1Y 0TX, United Kingdom.  
**OLYMPUS AUSTRALIA PTY. LTD.**  
104 Ferntree Gully Road, Oakleigh, Victoria, 3166, Australia

# OLYMPUS®

Olympus is about life. About photographic innovations that capture precious moments of life. About advanced medical technology that saves lives. About information- and industry-related products that make possible a better living. About adding to the richness and quality of life for everyone. Olympus. Quality products with a **FOCUS ON LIFE**

CONFOCAL LASER SCANNING  
BIOLOGICAL MICROSCOPES  
FLUOVIEW  
FV300/FV500

*UIS*  
UNIVERSAL  
INFINITY SYSTEM

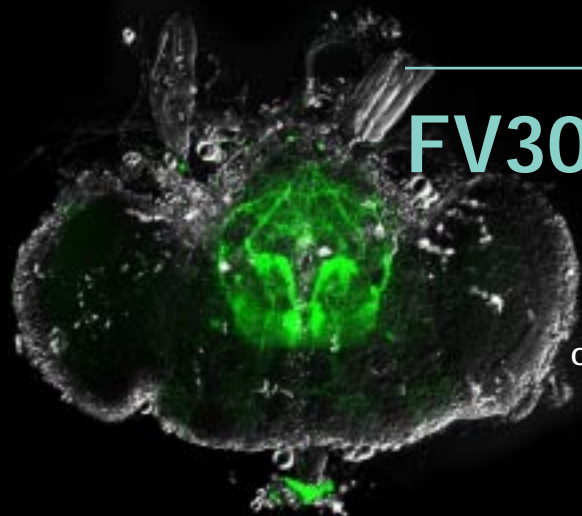


# The Olympus *FLUOVIEW* 300/500 Series — Giving both individual and group users the right solution to match their research needs and budget

The Fluoview FV300/FV500 Series offers a choice of two systems to meet the needs of an individual researcher or a number of researchers with a variety of different applications.

Both systems are compatible with the Olympus research range of microscopes offering high resolution confocal sectioning with the ability to conduct time-lapse experiments.

The Fluoview FV300/FV500 Series offers a wider number of options with the ability to upgrade the systems for the future.



**FV300** 2nd generation of personal system offering the highest specification at an affordable price

Highest image quality —  
offering 12 bit, 2048 × 2048 pixel resolution

Fast and flexible scan modes —  
(4 frame/sec at 512 × 512)

Easy, user-friendly operation of system



FV300+IX70

nt  
get.

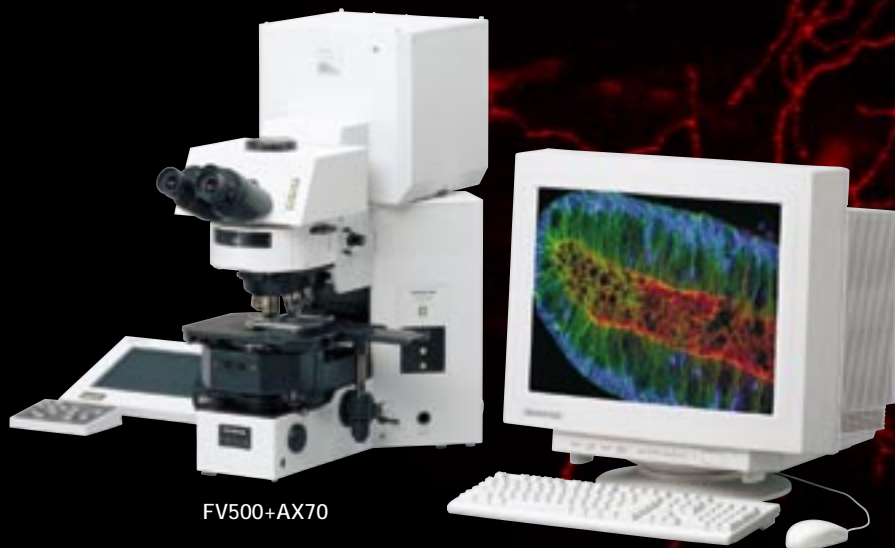
---

## **FV500** *Fully automatic system to meet a wide range of needs*

Adaptation of UV, visible light and near-infrared light laser light sources via 3 integrated laser ports

Up to 5 detectors available for simultaneous acquisition of separate images

Fully automatic image acquisition  
Software controlled microscope operation with AX microscope



# Scanning Units

## FV300

### Manual operating scanning unit

The scanning unit combines maximum optical efficiency with easy, one-touch selection of pinholes and filters.

The system corrects aberrations from visible to near-infrared wavelengths, allowing aberration-free imaging for a wide range of applications.

### Superior flexibility

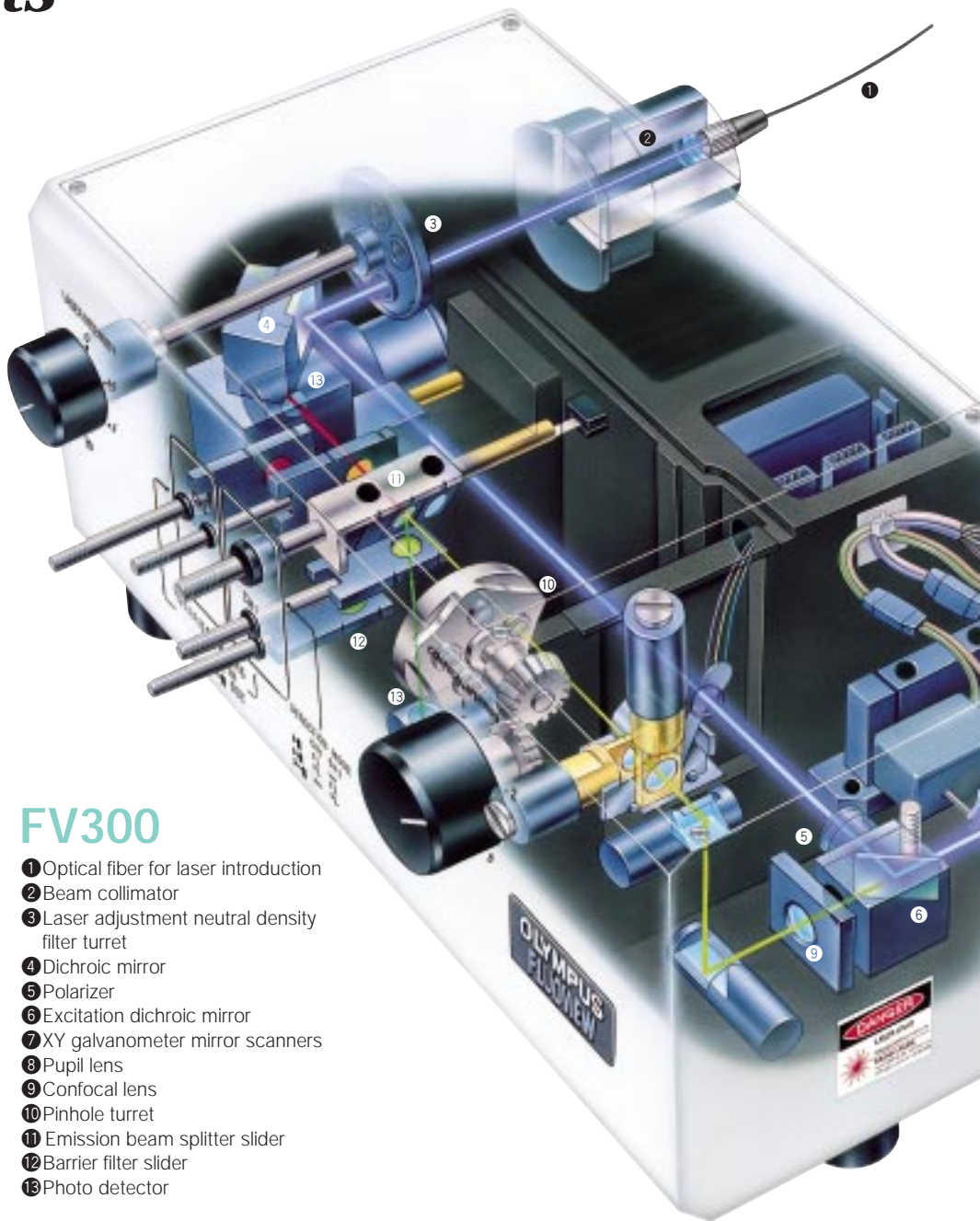
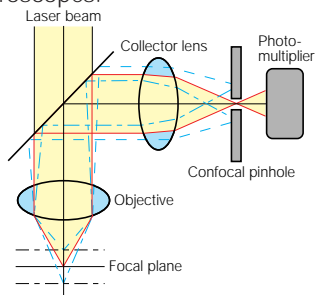
Empty filter holders are optionally available, allowing operators to custom design dichroic mirrors, emission beam splitters and barrier filters for specific applications.

### Compatible with a wide range of microscopes

The FV300 can be used with upright microscopes (BX50, BX50WI, BX60, AX70 manual version, AX70WI) as well as with the IX70 inverted microscope (side port attachment).

### Features of confocal optics

- Deliver flare-free, high-contrast images.
- Allow optical sectioning of a specimen with satisfactory vertical resolution (along optical axis).
- Horizontal resolution (perpendicular to the optical axis) is increased to a much higher level than conventional optical microscopes.



## FV300

- 1 Optical fiber for laser introduction
- 2 Beam collimator
- 3 Laser adjustment neutral density filter turret
- 4 Dichroic mirror
- 5 Polarizer
- 6 Excitation dichroic mirror
- 7 XY galvanometer mirror scanners
- 8 Pupil lens
- 9 Confocal lens
- 10 Pinhole turret
- 11 Emission beam splitter slider
- 12 Barrier filter slider
- 13 Photo detector

## FV300

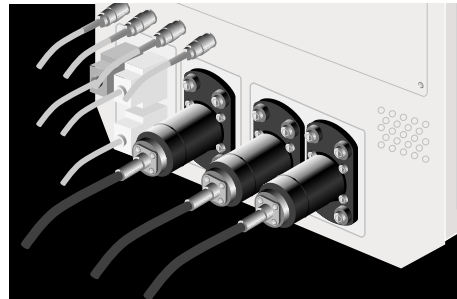
## FV500

Up to 3 Channels	Up to 5 Channels
Visible Light Lasers — (IR Laser)	UV — Visible Light — IR Lasers
1 Laser Port	3 Laser Ports
Manual Operating Scanning Unit	Fully Automated Scanning Unit
5 Position Single Pinhole Turret	Individual Continuously Adjustable Pinholes
Automatic Laser Control / Laser Combiner	
Power Supply / Control Unit — PC system	
Intuitive User Friendly Software	
Wide Range of Microscopes	

## FV500

### 3 laser ports / up to 6 lasers

Equipped with 3 fiber optic ports for UV, visible light (up to 4 lasers) and near infrared light lasers, the FV500 provides the variety of laser light sources necessary for imaging the latest generation of fluorescence indicators and fluorescent probes.



### Independent pinholes for each channel

Since the depth of confocal images depends on the fluorescent wavelength and the pinhole diameter, the FV500 employs an independent pinhole for each channel, ensuring the best possible confocal resolution of each fluorochrome.

### Simultaneous 5-channel image acquisition

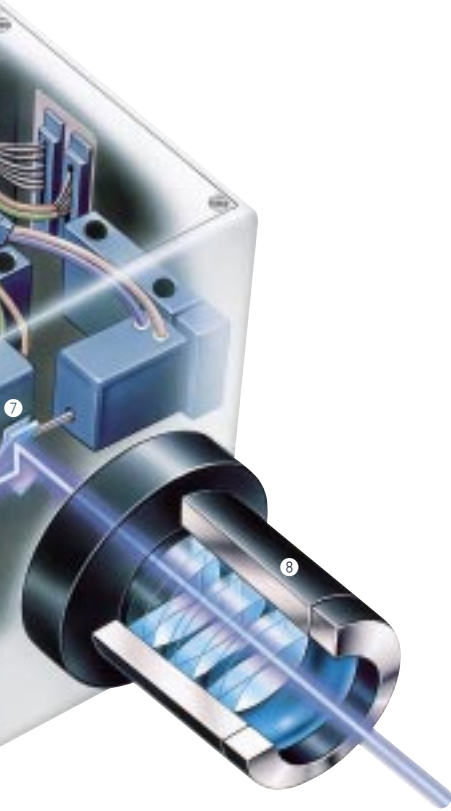
With up to 4 PMT detection channels for confocal fluorescence, plus a separate external PMT for transmitted light detection, the FV500 can record images with up to 5 channels simultaneously.

### Flexibility with dichroic mirrors and barrier filters

Olympus' unique design of barrier filters and dichroic mirrors for excitation and emission beam splitting allows easy exchange to adapt for specific needs of new applications.

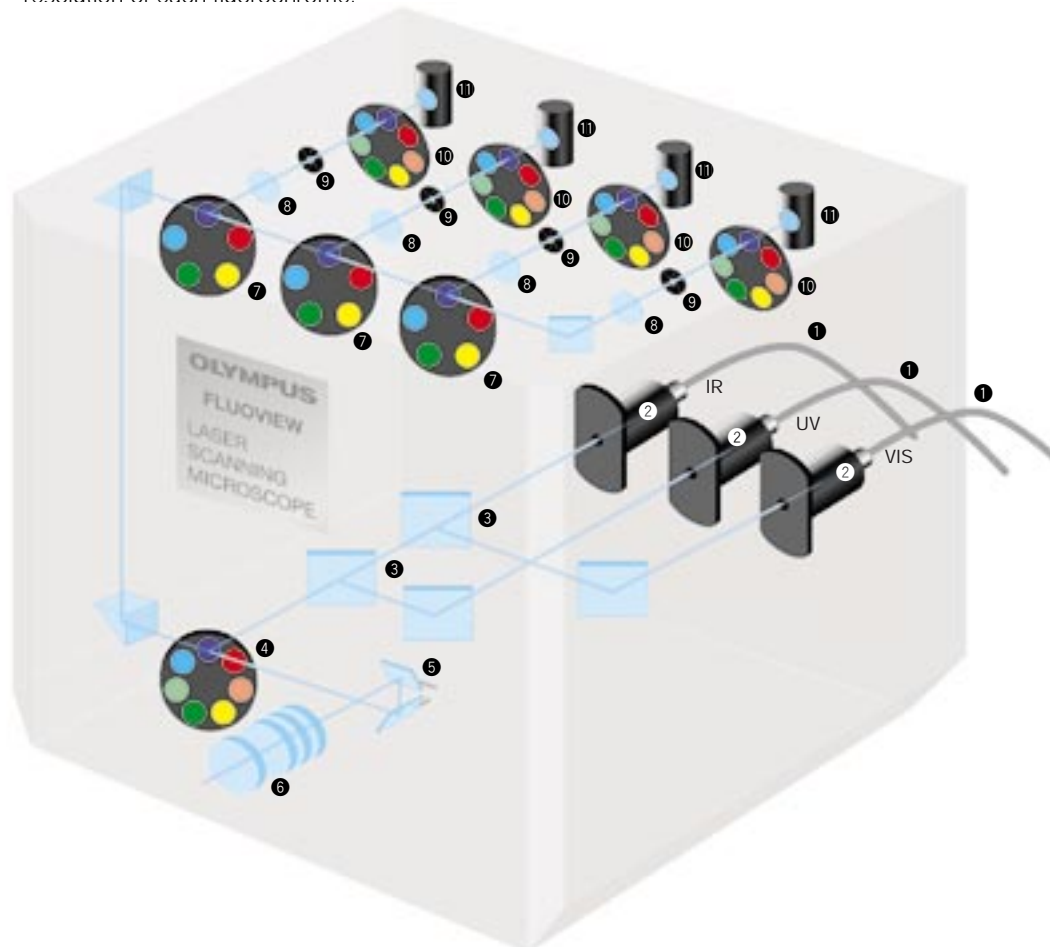
### Compatible with a wide range of microscopes

The FV500 can be used with upright microscopes (BX50, BX50WI, BX60, AX70, AX70WI) as well as IX70 inverted microscope with side or bottom port attachment.



## FV500

- ① Optical fiber for laser introduction
- ② Beam collimator
- ③ Dichroic mirror
- ④ Excitation dichroic mirror turret
- ⑤ XY galvanometer mirror scanners
- ⑥ Pupil lens
- ⑦ Emission beam splitter turret
- ⑧ Confocal lens
- ⑨ Adjustable Pinhole
- ⑩ Barrier filter turret
- ⑪ Photo detector



# Software Graphical User Interface

*Ultimate ease of operation and monitor display.  
The FV500 enables fully automatic image acquisition.*

## Tab-style monitor display

One-touch tab menu selection makes it easy to handle a multiple range of functions. Multiple images may be displayed and processed by simple, one-touch operations.

## On-line photo detector adjustment

PMT voltage, gain and offset of each individual channel can be adjusted by easy slider operation while monitoring the on-screen image. An auto gain function allows users to obtain optimized images with a simple mouse click.



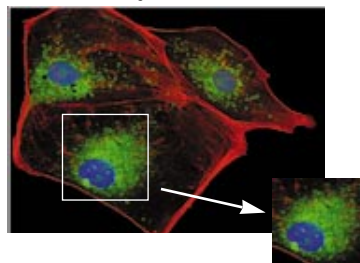
## Scan area: Graphic display, Pan and Zoom

The observation field and scanning area are both displayed graphically. Zoom magnifications can be increased in 0.5x increments up to 10x. The "pan" function allows the scan area to be moved within the field of view.



## Clip scanning and image cropping

A clip scan function allows selection of a sub-region of the field of view for faster image acquisition and efficient reduction of the total amount of image data. Applying the image cropping function, selected areas can be cut out of complex image stacks and saved for further detailed analysis.



## Dye selection display

When a fluorescence dye is chosen, the laser and light path settings are done automatically, with each of the selected fluorescence dyes displayed graphically on the monitor.

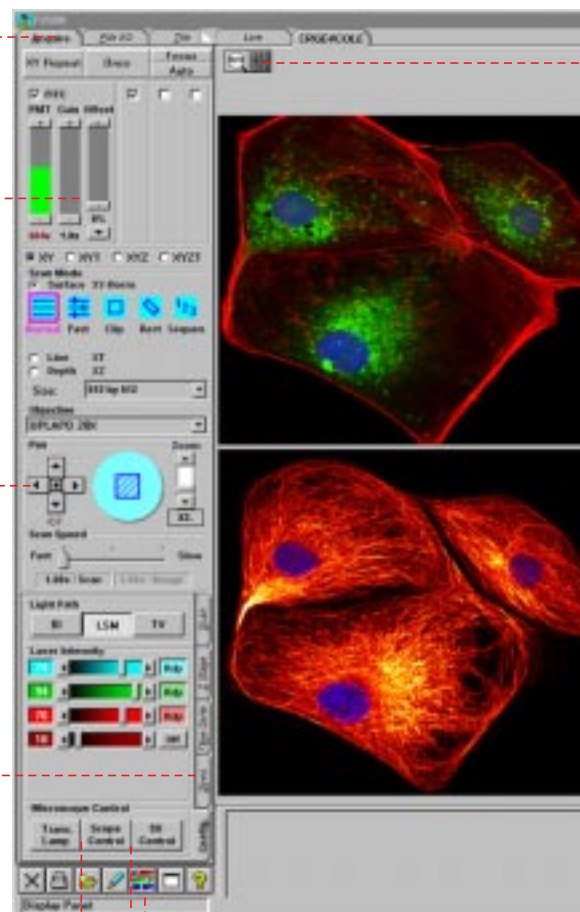


## Automatic operation of laser excitation and emission filters

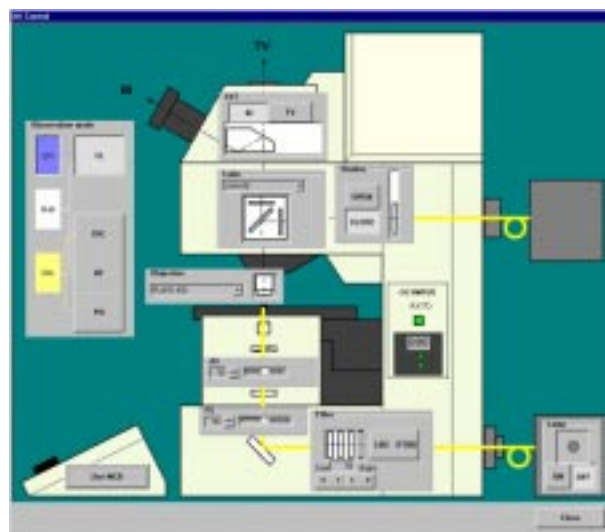
While operating the FV500, just enter the appropriate fluorescent dyes and the corresponding filters and mirrors are automatically selected. In addition, when combined with the automated AX70 upright microscope, controls for the microscope may also be software-automated, freeing researchers from time-consuming microscope operation.

## Registering operating conditions for individual researchers

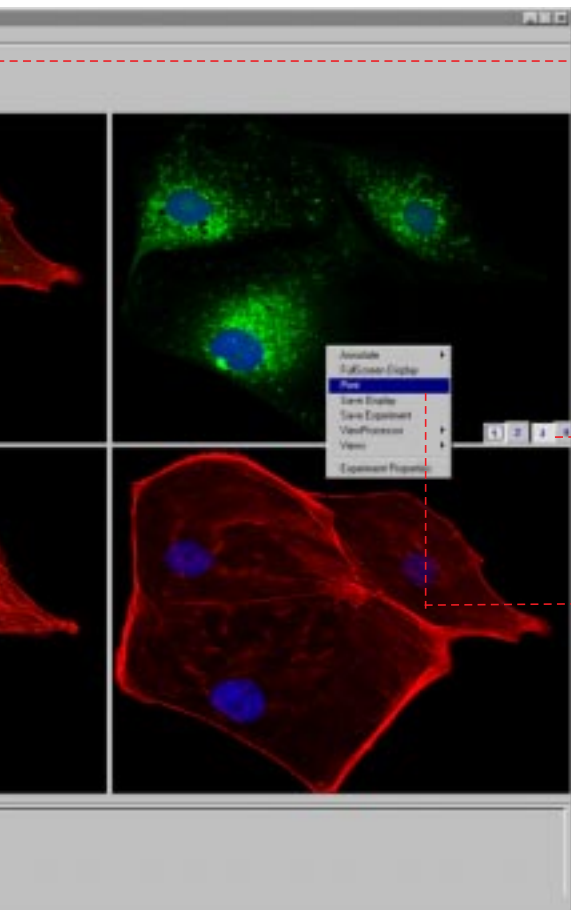
FV500's superior interface not only guarantees easy operation for beginners but also satisfies experienced researchers by its precise manual settings. In addition, each individual researcher's settings can be separately recorded and retrieved instantly — a real convenience when several researchers are using the same laser scanning microscope.



## Microscope set-up monitor display



FV500



### Scanning Display

Multiple images captured by simultaneous or sequential imaging can be displayed in a matrix format on a single page for review by use of the Tiling function.

### Versatile monitor display

Simple performance of useful functions such as multi-channel image overlay and channel selection options.

### Pop-up menu simplicity

To access frequently used commands, the right mouse click is used.

### Image tool bar

X-Y-Z scanning operations and time-lapse observations both produce multiple images, which can be displayed in sequence simply by clicking the sequential mode button. Channel selection and image zooming are also available on the same menu.

### Tiling display of multiple images

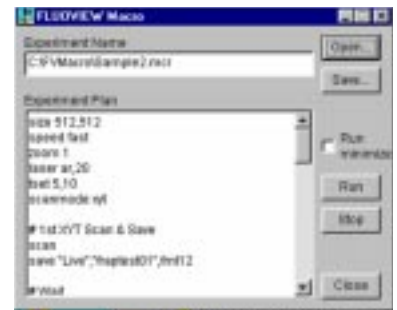
Observation of a specimen over an extended period of time and sectional imaging result in several separate images. The tiling function provides versatile viewing options including simultaneous multiple or multi-channel image display.

### Macro commands

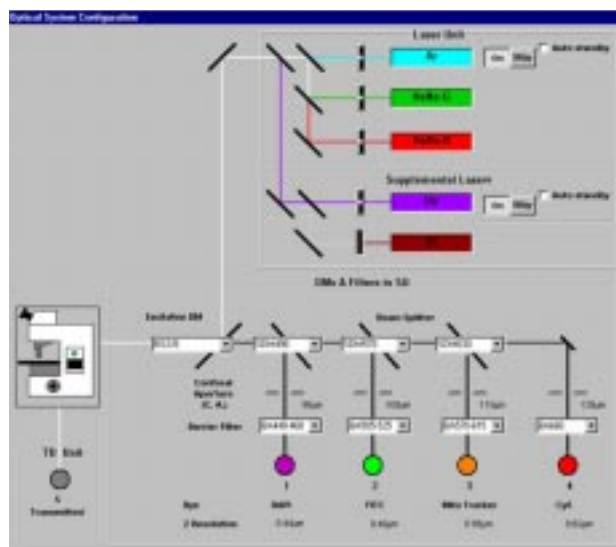
A series of software commands may be stored as a macro command file so that a particular imaging sequence or analysis may be easily replicated. Macro commands can increase speed and efficiency for complex procedures such as capturing a series of images through an external trigger.

### Toolbar access to frequently-used functions

The most frequently used functions can be accessed via buttons on the horizontal toolbar located at the bottom left of the screen. Icons simplify function identification: e.g. a color bar for pseudo-color processing through LUT editing, and a pencil for inserting comments on measurements and images.



### Scanning unit set-up monitor display



FV500



LUT editing monitor display

### Short-cut key

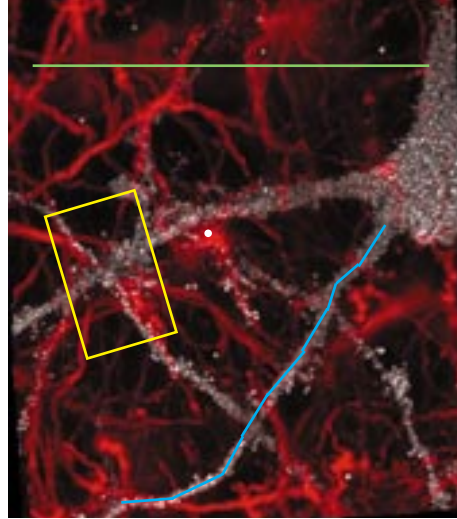
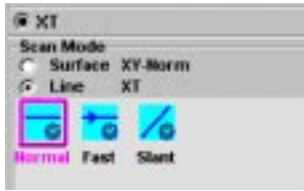
Scan mode selection and other basic operations can be performed by pressing simple key combinations on the keyboard.

# Scanning

Innovative scanning method for improved performance

## Olympus efficient scanning modes

Point, line, free line and vector scanning modes make the FV300/FV500 especially suitable for many time lapse applications.



X Line



Y Line



SlantLine

### Line scanning

A single line may be scanned, oriented at any angle in the XY plane. This fast scanning option permits accurate quantitation of physiological events such as Calcium waves or sparks.



Vector

### Vector scanning

The scanned rectangular area can be rotated in the XY plane, enabling efficient sampling of the specimen.



Spot

### Point scanning

The ultimate in fast scanning, the point scan enables accurate quantitation intensity changes during rapid physiological events.



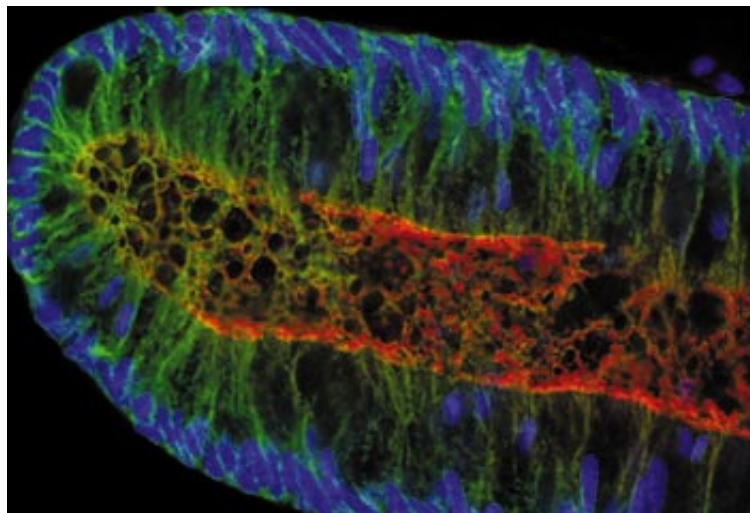
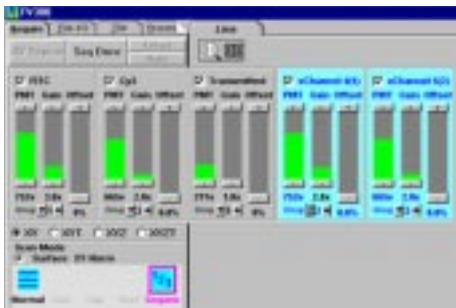
FreeLine

### Free line scanning

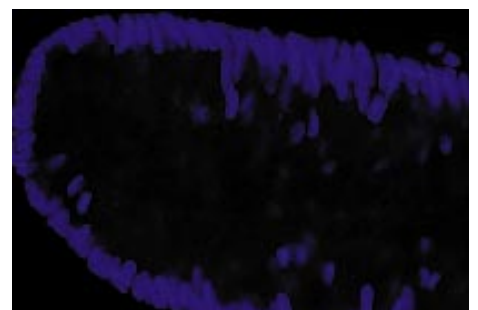
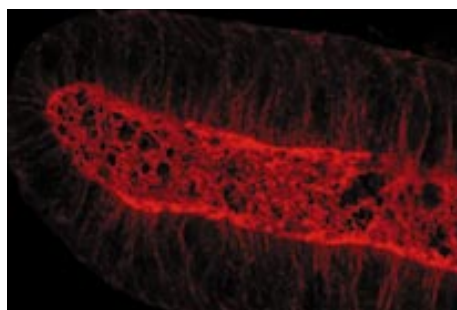
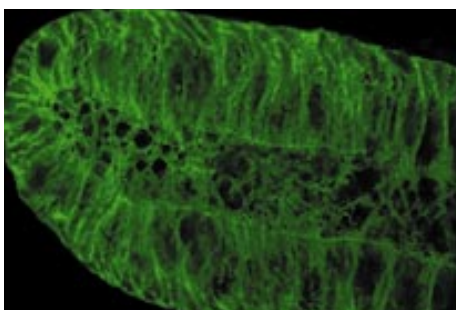
Intensity changes may be measured over a given period of time along the length of a freely drawn line, such as the trace of an axon or along a cellular junction.

## Sequential scanning prevents cross talk

By applying the laser appropriate to each fluorochrome used, sequential scanning prevents cross talk between multiple channels in dual, triple or multi-stained specimens.

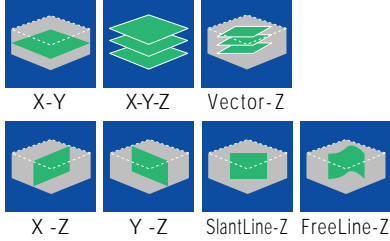


**Human colon crypt**  
Nuclei (Blue) TO-PRO-3  
Actin (Red) Alexa 568  
APC gene product (Green) Alexa 568  
Christine Anderson,  
Laboratory of Prof. Ray White,  
Huntsman Cancer Institute, Utah



# 3D Imaging

Using multiple 3D images to obtain accurate 3D Structure analysis



## Easy Z axis operation and setting

Captures images via the "up and down" buttons or by inserting a numerical value to define the upper and lower limits of the observation area. Choose a step size increment and the XYZ image stack will be acquired automatically.

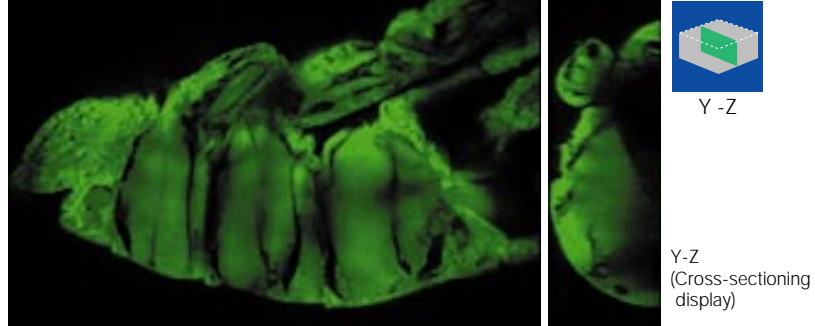


## Automated control of Z position enables accurate X-Y-Z image acquisition and rapid generation of cross sectional images

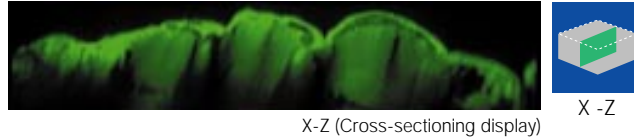
Software-controlled sectioning in increments as little as 25nm permits detailed 3D analysis of cellular structures.

### Visualization

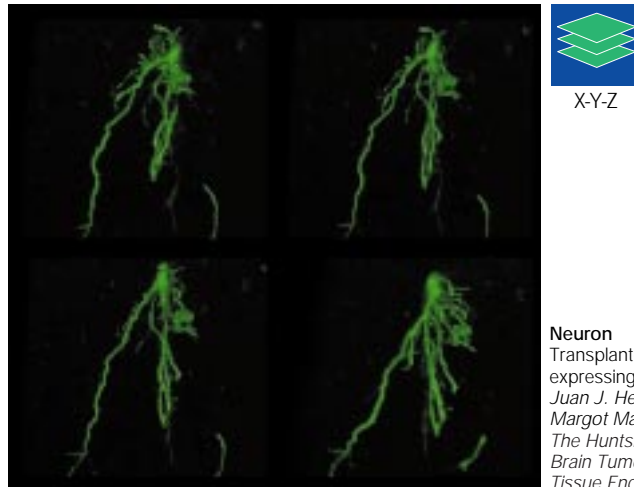
Extended depth images as well as red/green stereographic images may also be generated. The lateral structure of a cell may be analyzed through an X-Z cross-sectional observation.



X-Y (Plane display)



X-Z (Cross-sectioning display)



Tiled display of 3D measured image stack

### Neuron

Transplanted glial precursor cell expressing Green Fluorescent Protein (GFP)  
 Juan J. Herrera,  
 Margot Mayer-Pröschel's Laboratory,  
 The Huntsman Cancer Institute  
 Brain Tumor program, and W. M. Keck Center for  
 Tissue Engineering, Salt Lake City, Utah

# Analysis

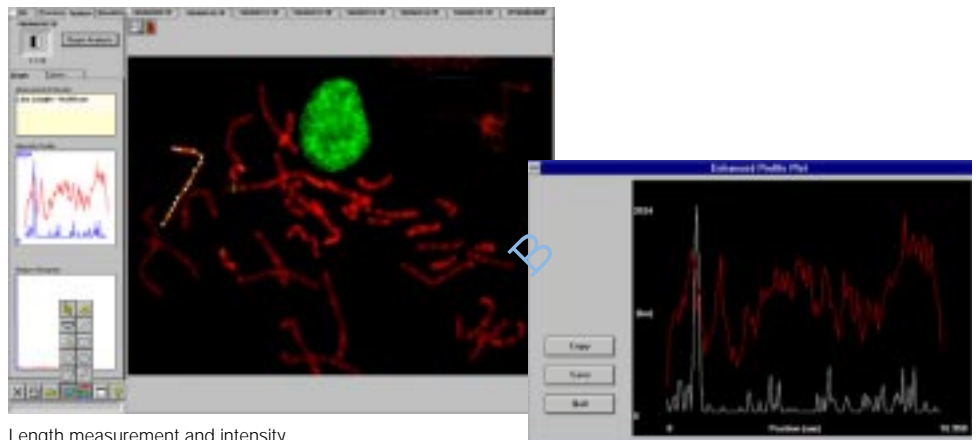
High resolution 12 bit image, the basis of quantitative imaging

## Comprehensive analysis software

Fluoview images may be analyzed for multiple parameters including length, distance, size, area integrated and average fluorescence intensity measurements, as well as intensity changes over time or distance. All quantitative data may be stored in a spreadsheet format for analysis in programs such as Microsoft Excel.

## Clear images provided by 12 bit-depth image resolution

12-bit, 2,048x2,048 pixel high-resolution images provide maximum spatial and intensity information. Flexible color look up table manipulation over the wide dynamic range of 4,096 gradations highlights even the slightest changes in fluorescence intensity.

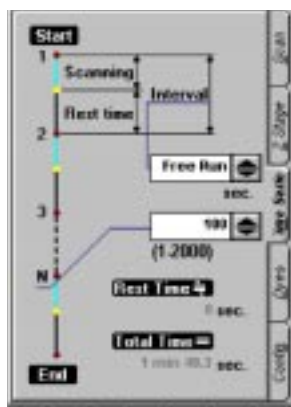
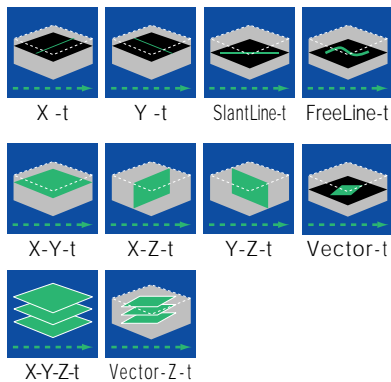


Length measurement and intensity

Intensity along free-line

# Time Course

Using different scanning modes to chart time-lapse changes efficiently



## High-speed (4 frames/sec) image acquisition

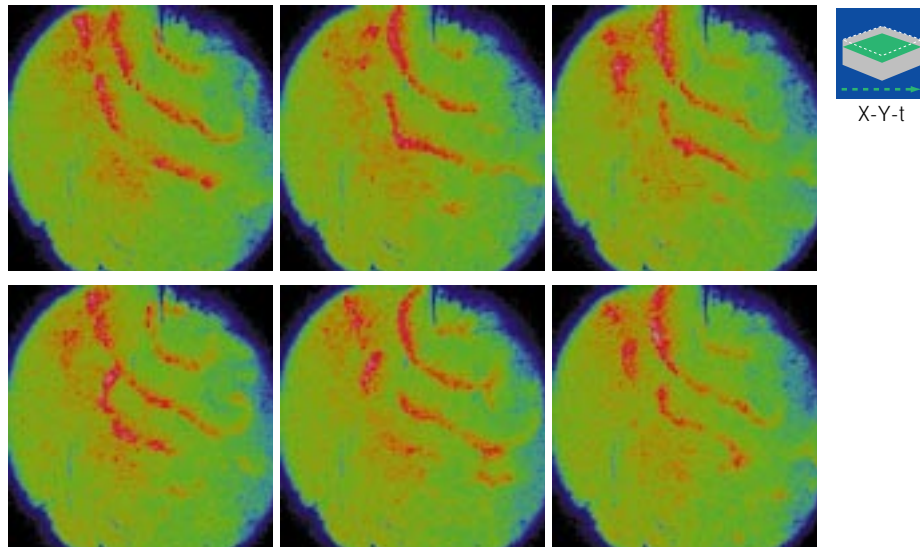
The unit's high-speed image capturing mode provides 4 confocal frames (512x512 pixels) per second. This bi-directional fast scanning mode can be used to record rapid changes such as calcium ion density.

## Versatile line scanning modes has many uses

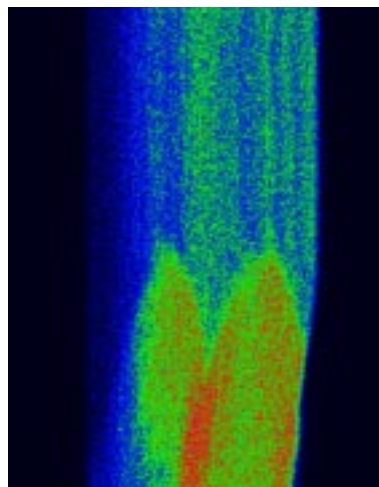
The wide range of line scanning modes (linear/oblique/free-line) enables flexible analysis of rapid time-lapse changes in the specimen.

## High precision analysis of time-lapse changes

The wide dynamic range of 12-bit images with 4,096 gray levels covers subtle as well as dramatic changes in fluorescence. By using rectangles, circles or free-line areas, the operator can designate several regions of interest (ROI), observe and measure them simultaneously during (on-line plot) or following time lapse observations through the display of intensity versus time graphs.

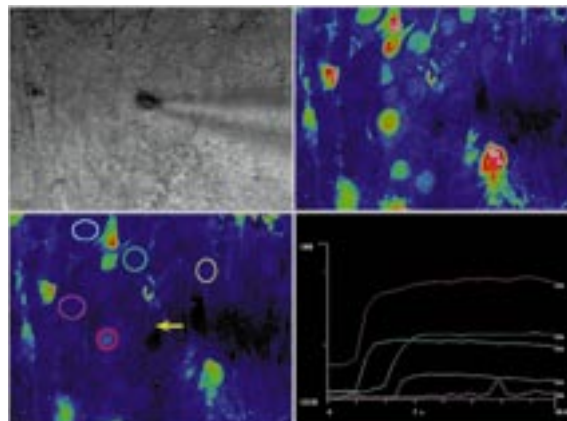


Calcium wave in *Xenopus* oocyte, Calcium Green staining, fluorescence pseudo-colored fluorescence image after injection of inositol 3-trisphosphate  
Japan Science and Technology Corporation, Exploratory Research for Advanced Technology, Mikoshiba cell control project, Prof. Aya Muto



X-t

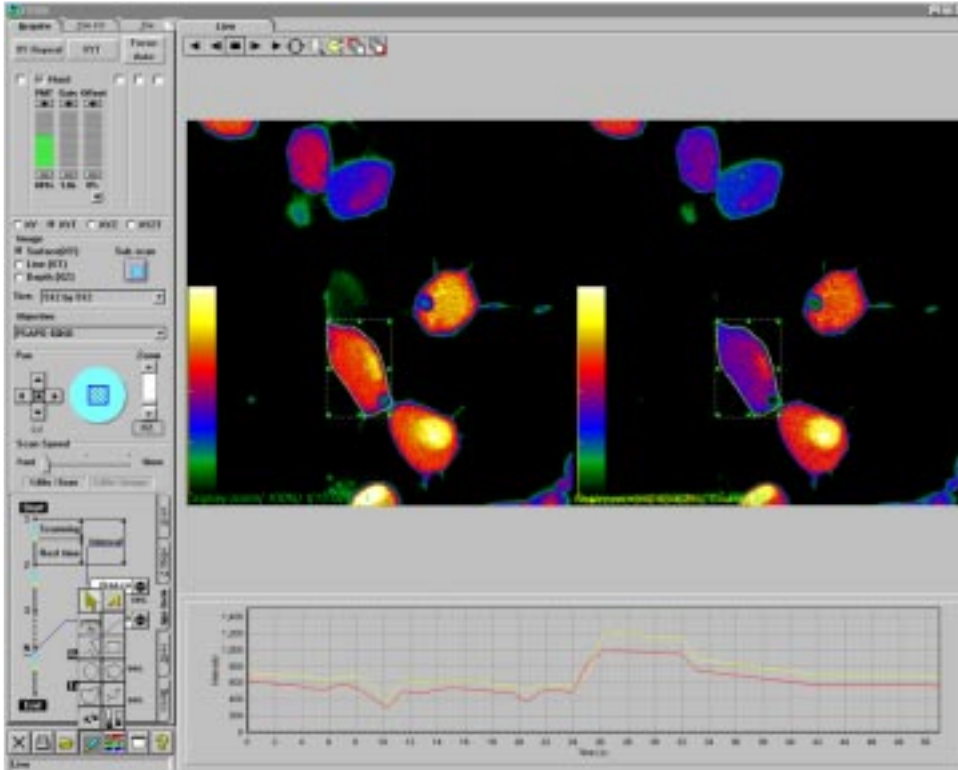
Calcium wave in isolated cardiac myocyte  
Dr. Sandor Gyorke  
Texas Technical University



## Immersion-type LUMPLFL objectives

The 40x water immersion objective in this series has a 3.3mm working distance and an extremely fine tip which is suitable for micromanipulation using a fixed stage upright microscope. It has a large N.A. (0.8) and is also ideal for confocal observations. When using the AX70WI or BX50WI (fixed stage upright microscopes) with water immersion objectives confocal imaging can be used to monitor time lapse fluorescence changes in thick specimens such as brain slices.

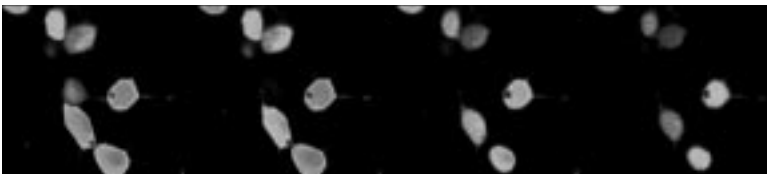




Real time kinetic measurement display

### Real-time kinetic measurement

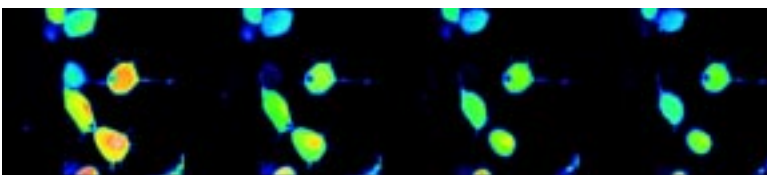
Time course software permits the real-time display of intensity graphs during the acquisition of fluorescence images over time. Event markers may also be inserted during the experiment to correlate changes in experimental conditions (optional).



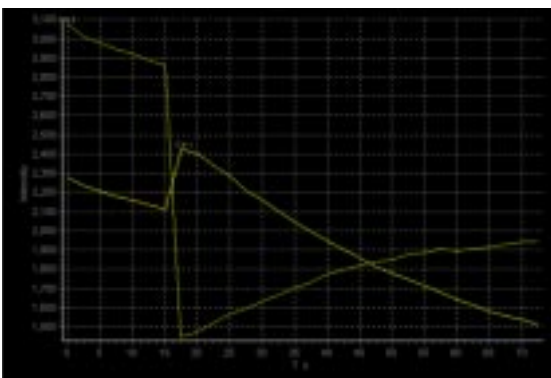
X-Y-t  
Ch1  
Fluorescence  
wavelength 405nm



Ch2  
Fluorescence  
wavelength 485nm



Ratio image

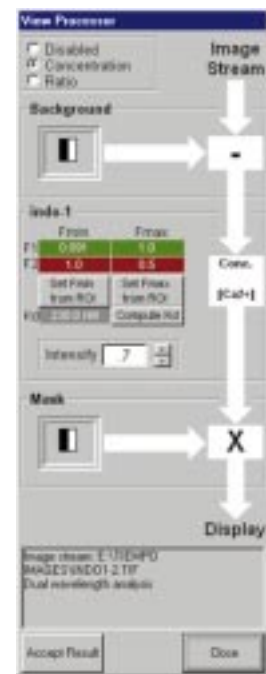


Time-lapse  
intensity change graph

Fluorescence image of nerve cell culture NG108-15 stained by INDO-1 and stimulated by bradykinin. Graphs show intensity change over time.

### Ratio imaging for analysis of 2-wavelength fluorescence images

Using the view processor function, time course software allows a series of images obtained for two different wavelengths to be displayed as a pseudo-colored ratio image.



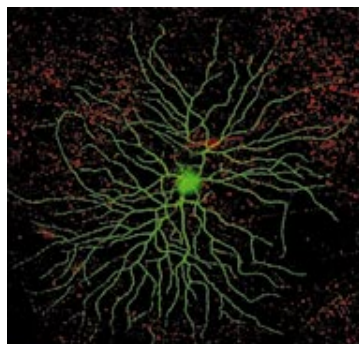
Extensive quantitative analysis of defined regions can be displayed using embedded graphing capabilities (optional).

### Input/output of external trigger signal

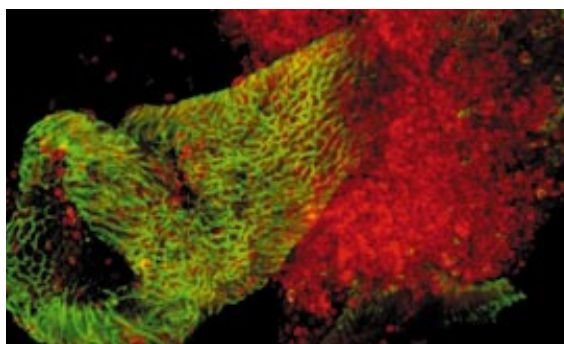
External devices such as those used in patch clamp experiments can be synchronized with image acquisition using the input and output of trigger signals (optional).

# Applications

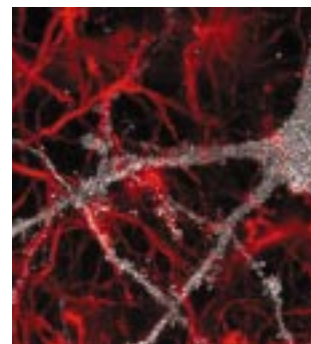
Capable of a wide range of fluorochromes and imaging modalities



Lucifer Yellow: retina ganglion cell  
TexasRed: dopamine-operated  
amacrine cell  
Dept. of Biological Sciences, Kyoto Univ.  
Faculty of Medicine,  
Prof. Shigetada Nakanishi



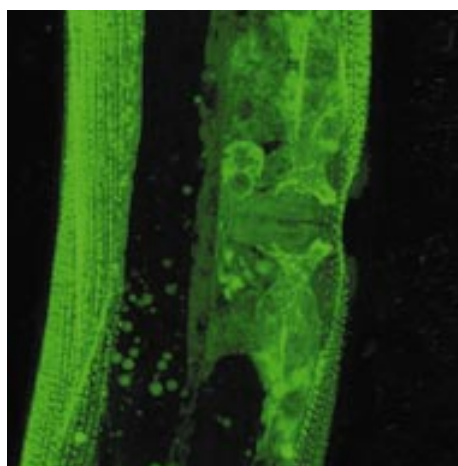
Human Colon Crypt  
Alexa 488 and To-Pro 3,  
Christine Anderson, Prof. Ray White's laboratory,  
Huntsman Cancer Institute, U. Utah



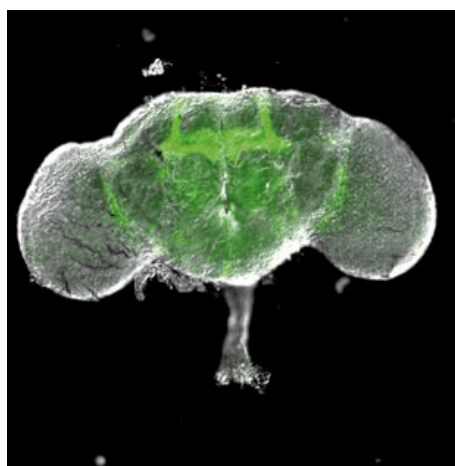
Brain slice: Golgi stain (white/black) reflection  
image, GFAP (Red)  
Alexa 594  
Matt Blurton-Jones, Prof. Mark Tuszynski's Laboratory,  
University of California, San Diego

## Fluorescent Proteins

Live cell observations using spectral variants of  
Green fluorescent protein (GFP)



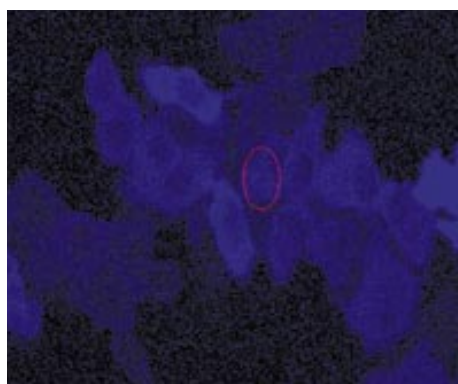
C elegans expressing beta-integrin fused to GFP  
Dr. Xioping Xhu and Dr. John Plenefisch  
University of Toledo, Dept. of Biology



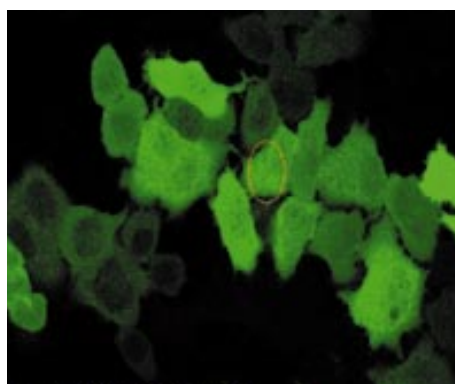
GFP-labeling of Drosophila adult brain with staining  
of mushroom bodies  
Tokyo Metropolitan University, Science Dept.  
Cytogenetics  
Assistant Prof. Aigaki

### Imaging of multiple GFP related fluorescent proteins

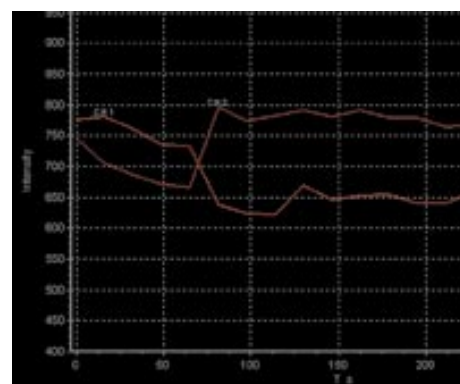
The factors which control the expression of  
genes in live cells and developing  
organisms can be studied using hybrid  
fluorescent proteins genetically fused to  
genetic sequences of interest. By using  
spectral variants of GFP, multiple genetic  
markers can be studied at the same time.  
By combining Nomarski DIC images, the  
localization of GFP expressing areas in the  
cell or organism can be clearly confirmed.



CFP Fluorescence wavelength 485nm



YFP Fluorescence wavelength 530nm

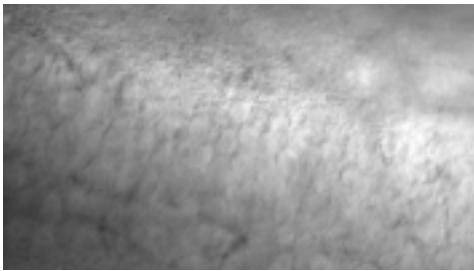


FRET — Time course of fluorescence intensity changes on time

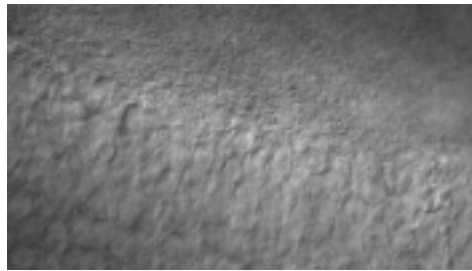
### CFP/YFP FRET

Calcium ion concentration in a live HeLa cell using a chameleon (split type) indicator. Energy transfer between CFP and YFP is proportional to bound calcium. The time series shows the increase of calcium ion density caused by stimulation of histamine and the effect of blocking by proheputajin.

# IR observations *Clear observation of depth In living cells with near-infrared laser diode*



DIC image by 543nm Helium Neon laser  
Human skin tissue Depth: Approx. 80µm



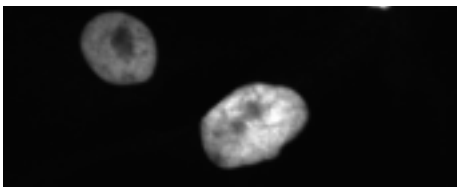
DIC image by 750nm near infrared laser  
Human skin tissue Depth: Approx. 80µm

FV500

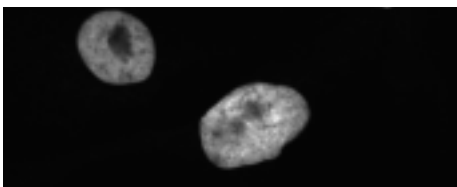
## Deep tissue imaging

Deeper parts of the tissue are well observed by using near-infrared laser light, which shows high transmission rate and causes less photo damage to the cell or tissue.

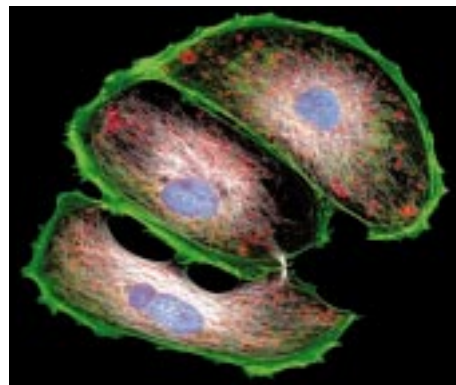
# UV observations *Optimum performance with Olympus unique UV optics*



Standard UV water immersion objective  
UAPO40xW/340, PtK2 Nucleus (DAPI)



Unique UV water immersion objective for LSM  
UVAPO40xWLSM, PtK2 Nucleus (DAPI)



Structure of PtK2 cell  
Nucleus: DAPI (Blue)  
Actin: FITC (Green)  
Mitochondria: Mito Tracker (Red)  
Microtubules: Cy5 (White)

FV500

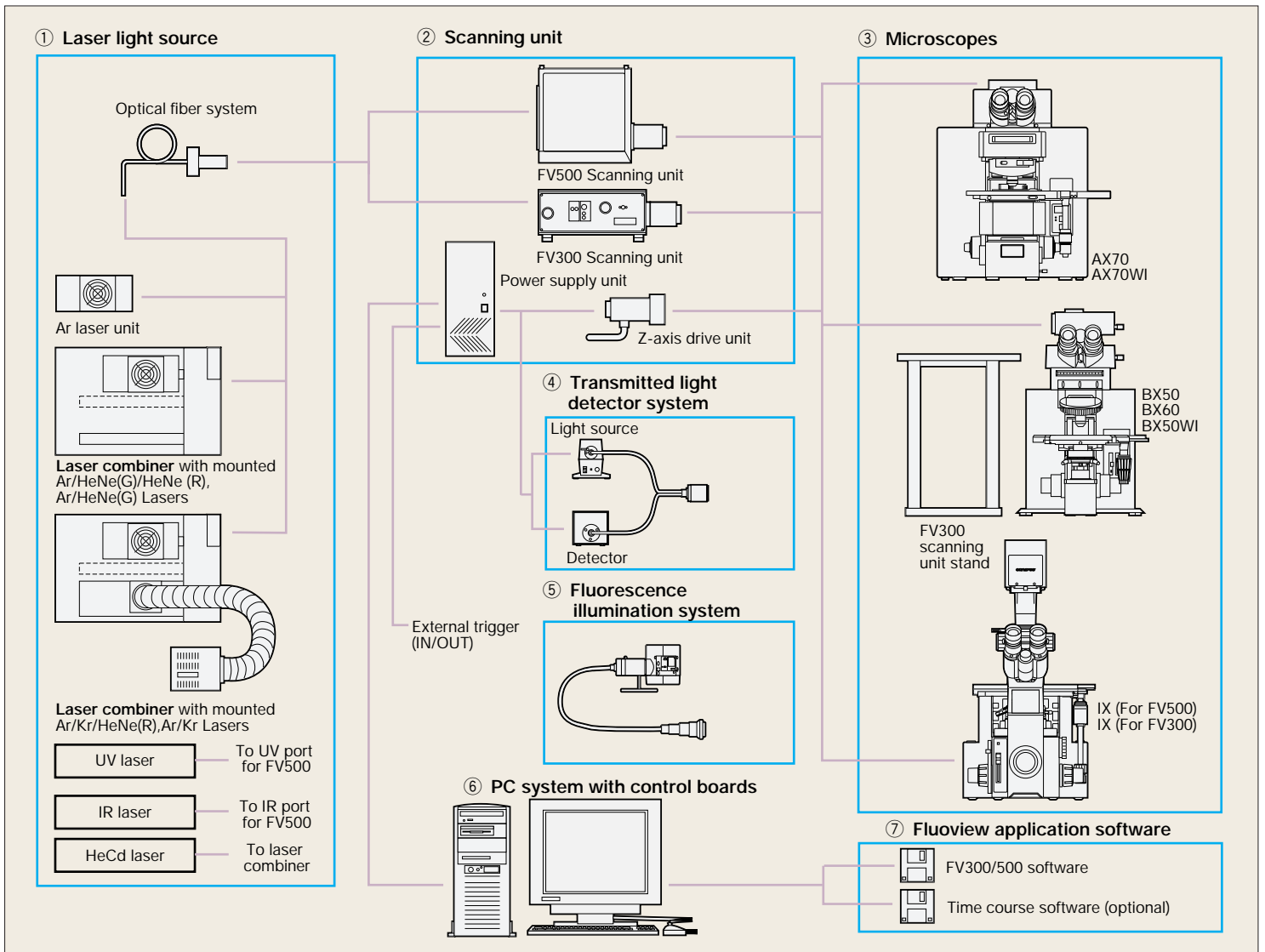
## Simultaneous observation of fluorescence (UV-VIS)

Olympus new unique UV-corrected optics allows superior confocal imaging of UV excited fluorochromes combined with standard visible light fluorescence dyes. The FV500 simultaneously captures up to 5-channels, 4-channels for fluorescence plus one channel for DIC.

## Spectral data of fluorescence dyes

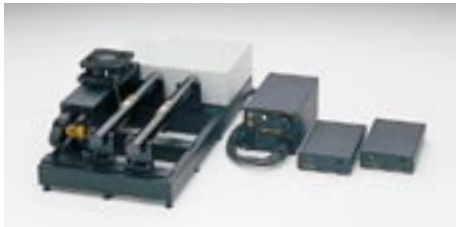
Fluorochrome	Excitation peak wavelength (nm)	Emission peak wavelength (nm)	Remarks
Alexa Fluor 350	346	442	Antibody labeling
Indo-1	350	405/480	Ca <sup>2+</sup> (2-wavelength fluorescence)
Hoechst 33342	355	465	A-T range of nucleic acid
Hoechst 33258	365	465	A-T range of nucleic acid
4,6-diamidino-2-phenylindole HCl (DAPI)	372	456	A-T range of nucleic acid
Lucifer yellow CH	430	535	Tracer, fixable
Alexa Fluor 430	431	541	Antibody labeling
CFP	433,455	475,501	Cyanin fluorescent protein
Acridine orange	490	530/640	Single/double stained nucleic acid
Carboxy SNARF-1	490	580/630	pH indicator
Calcein	495	520	Bone growth
Marocyanine 540	500	572	Membrane potential
Rhodamine 123	500	540	Mitochondria, Apoptosis
Calcium Green	506	526	Calcium indicator
Fluo-3	506	526	Calcium indicator
YFP	513	527	Yellow fluorescent protein
Carboxy SNARF-1	530	580/630	pH indicator (2-wavelength fluorescence)
Ethidium bromide	545	605	DNA, RNA
Evans blue	550	610	Retrograde labeling
RFP (DsRed)	558	583	Red fluorescent protein
Pararosaniline-Feulgen	560	625	DNA
Cascade Blue	372	456	Antibody labeling
BFP	380	440	Blue fluorescent protein
DIOC <sub>6</sub> (3)	480	501	Endoplasmic reticulum
DIO	484	501	Positive ionicity, tracer
GFP	488	507	Green fluorescent protein
FM 1-4 3	488	520	Synapse, endoplasmic reticulum
Cy2	489	506	Antibody labeling
FITC	490	520	Antibody labeling
YOYO 1	490	510	DNA
Alexa Fluor 488	495	519	Antibody labeling
BCECF-AM	500	530	pH indicator
BODIPY FL	503	512	Antibody labeling
Propidium iodide	530	615	DNA, RNA
Alexa Fluor 532	531	554	Antibody labeling
TRITC	541	572	Antibody labeling
Dil	550	565	Positive ionicity, tracer
Cy3	552	565	Antibody labeling
Alexa Fluor 568	578	603	Antibody labeling
Alexa Fluor 594	590	617	Antibody labeling
Texas Red	596	620	Antibody labeling
Cy5	650	667	Antibody labeling
Cy7	743	767	Antibody labeling

Note: Dot in spectrum indicates the excitation peak wavelength



**Laser combiner / wide variety of lasers**

The use of an electronic laser combiner provides a platform to mount a variety of visible light lasers as well as to adapt external UV and IR lasers (only FV500). The Software controlled shutters and continuous ND wheels allow activation of each individual laser line and intensity selection.



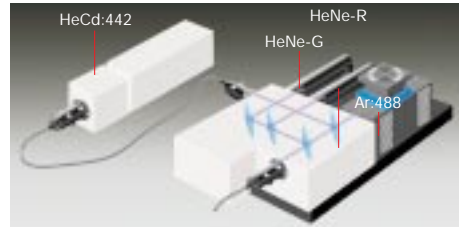
Laser combiner with Ar+HeNe (Red) / (Green) lasers



Laser combiner with Ar+HeNe (Red)+Kr laser systems

**He-Ne (HeCd) laser for CFP/YFP FRET imaging**

An optional Helium-Cadmium laser is available for optimal FRET imaging. The 442nm HeCd emission is required to excite CFP without exciting YFP (cross-talk) and is suitable for CFP/YFP FRET applications.



Combiner for FRET

**External transmitted light detector system and fluorescence illumination unit**

The former consists of the external PMT for transmitted light detection and transmitted light illumination, both adapted to the microscope frame via dual fiber system (patent pending). The latter is the fluorescence illumination unit using a fiber.



External transmitted light detector system



Fluorescence illumination unit

## Specifications

		FV300	FV500
① Laser light source	Visible light laser source	Select Ar laser(488nm, 10mW)/Kr laser (568nm, 10mW)/HeNe (G) laser (543nm, 1mW)/HeNe (R) laser(633nm, 10mW), to be mounted on laser combiner/HeCd (Helium cadmium) Laser 442nm 12mW to laser combiner	
	UV laser	—	Connect UV-Ar laser (351nm, 40mW) to the special port via fiber system
	IR laser	—	Connect IR diode laser (CW750nm, 2mW) to the special port via fiber system
	Laser combiner	Each laser light path is equipped with a continuously variable neutral density filter and a shutter. All laser lines are combined to apsis along the same fiber optic.	
② Scanning unit	Scanning method	Galvanometer mirror scanners (both X and Y)	
	Field number (N.A.)	20	18
	Pinhole	5-position pinhole turret	Continuously adjustable pinhole for each individual detection channel
	Image memory and scanning speed	Standard scanning mode: 256x256(0.45s) - 2048x2048(10.835s) (Simultaneous scanning up to 5 channels) Bi-directional high-speed scanning mode: 512x512(0.25s) (Simultaneous scanning of up to 2 channels)	
	Image channel	Selectable from 2-channel (fluorescence) or 2-channel (fluorescence) + 1-channel (transmitted light)	Selectable from 2-channel (fluorescence) + 1-channel (transmitted light); 3-channel (fluorescence) + 1-channel (transmitted light); or 4-channel (fluorescence) + 1-channel(transmitted light)
	Selection of filters according to staining	Manual selection	
	Scanning modes	1-dimension: Spot scanning 2-dimension (space): X-Y,vector, X-Z, linear line-Z and free line-Z 2-dimension (time): X-t, linear line-t and free line-t 3-dimension (space): X-Y-Z and vector-Z 3-dimension (time): X-Y-t, X-Z-t and vector-t 4-dimension: X-Y-Z-t and vector - Z-t	
	Image depth resolution	12-bit (=4096 grey levels)	
	Zoom	1x-10x (0.5x-step)	
	Z-drive	Step motor/Minimum step 0.025µm	
③ Microscopes	Upright	AX70, AX70WI, BX50, BX60, BX50WI	
	Inverted	With special modified IX body for FV300	With special modified IX body for FV500
④ External transmitted light unit	Transmitted light illumination unit	External halogen light source connected to microscope via fiber cable	
	Transmitted light detector	External detector unit with built-in photomultiplier. Connected to microscope frame via fiber cable	
⑤ Fluorescence illumination unit	Connect to external mercury light source and microscope via fiber cable		
⑥ PC with system control boards	IBM PC-AT compatible, OS: Windows® NT4.0/Memory: 256MB RAM or larger,CPU: Pentium® III 550MHz or higher Hard disk: 9GB or larger, Special I/F board, Image acquisition: PCI bus Monitor: Selectable from 19, 21-inch, 1280x1024, Full color (16.77million colors)		
⑦ Fluoview application software	Image acquisition	Scanning condition setting: image size, scanning speed, zoom, panning etc. Automatic PMT sensitivity adjustment, Real-time image calculation: Kalman filtering, peak integration	
	Hardware control	Scanning unit, laser set-up, external transmitted detector	Laser setup, scanning unit, external transmitted detector, microscope (AX70)
	Image display	Each image display: Single-channel, side-by- side, merge, cropping, tiling, series and continuous LUT: Individual color setting, pseudo-color Overlay: Lines, text, scale bar, arrows, ROI, etc	
	Image processing	Individual filter: Average, Low-pass, High-pass, Sobel, Median, Prewitt, DIC background shading correction, 2D Laplacian, edge enhancement etc. Calculations: Inter-image, mathematical and logical	
	Image analysis	Overview of fluorescence intensity within an area, histogram, perimeter measurement for user-assigned area, time-lapse measurement etc.	
	3D visualization	3D animation, left/right stereo pairs, red/green stereoscopic images and cross section	
	Others	Image format:16-bit Olympus multi TIFF, 8-bit TIFF/BMP, 24-bit TIFF/BMP, Help (Text and graphic-based help), time-lapse measurement etc., Time course software, Trigger IN/OUT function	
Power consumption	Microscope (100V 6A/230V 3A), scanning unit+PSU (100V 3.5A/230V 2A), computer & monitor (100V 4.5A/230V 10A), Ar laser (110V 20A/230V 10A), Kr laser (230V 20A), HeNe laser each (100V 0.4A/230V 0.2A), UV laser (230V 30A), IR laser (110V 1A/230V 0.5A), HeCd laser (110V 5A/230V 3A)		

### Special objectives for LSM

Changes in refractive index adversely affect the intensity and apparent distance during deep confocal imaging. Water immersion type objectives are recommended for observation of biological samples because the refractive index of the objective is the same as the specimen. The PLAPO40xWLSM and PLAPO60xWLSM objectives perfectly correct spherical and chromatic aberrations in the 400-750nm wavelength range.



Objectives	N.A.	W.D. (mm)
PLAPO40xWLSM	0.9	0.15
PLAPO60xWLSM	1.0	0.15
PLAPO60xOLSM	1.1	0.13

Cover glass thickness range:  
0.17±0.01mm

### AX/BX

Objectives	N.A.	W.D.	DIC
UPLFL10x	0.30	10.00	U-DP10
UPLAPO10x	0.40	3.10	U-DP10
UPLFL20x	0.50	1.60	U-DP20
UPLAPO20x	0.70	0.65	U-DPA20
UPLAPO20xO	0.80	0.19	U-DPA20
UPLAPO40xOI	0.50-1.00	0.12	U-DPA040
UPLAPO40x	0.85	0.20	U-DPA40
PLAPO60xO	1.40	0.10	U-DPA060
UPLAPO100xOI	0.50-1.35	0.10	U-DP100
UPLAPO60xW	1.2	0.28	

### New unique objective for UV confocal imaging

Olympus unique UV-corrected apochromatic objective allows superior confocal imaging of UV excited fluorochromes. The objective is corrected from 350 - 650 nm to acquire superior quality multi-channel confocal images.



The infinity-corrected water immersion 40x objective brings both the UV excitation and the blue emission to the same focal point as visible light. Therefore it enables true confocal imaging throughout the field of view.

Objective	N.A.	W.D. (mm)
UVAPO20xWLSM	0.4	0.15mm
UVAPO40xWLSM	0.9	0.13mm

Cover glass thickness range:  
0.17±0.01mm

### IX

Objectives	N.A.	W.D.	DIC
UPLFL10x	0.30	10.00	IX-DP10
UPLAPO20x	0.50	1.60	IX-DPA20
UPLAPO40x	0.85	0.20	IX-DP40
UPLFL60xOI	0.65-1.25	0.10	IX-DPO60
PLAPO60xO	1.40	0.10	
UPLAPO100xOI	0.50-1.35	0.10	IX-DPO100
UPLAPO60xW	1.2	0.28	IX-DPO60

### Clear depth observation by using special near-infrared objectives with IR laser light

The UPLAPO60xW/IR water immersion objective is corrected for wavelengths from 450nm to 1,100nm.



Simultaneous IR-DIC observation is obtained, with no confocal aberration between the visible fluorescence and IR DIC images. The IR laser port of the FV500 has a straight optical feature without refraction.

Objective	N.A.	W.D. (mm)
UPLAPO60xW/IR	1.2	0.28

Cover glass thickness:  
0.13-0.21mm

### AX70WI/BX50WI

Objectives	N.A.	W.D.	DIC
MPL5x	0.10	19.60	
UMPLFL10xW	0.30	3.30	U-LDPW10H
UMPLFL20xW	0.50	3.30	U-LDPW20H
LUMPLFL40xW	0.80	3.30	U-LDPW40H
LUMPLFL60xW	0.90	2.00	U-LDPW60H
LUMPLFL40xW/IR	0.80	3.30	U-LDPW40H
LUMPLFL60xW/IR	0.90	2.00	U-LDPW60H
LUMPLFL100xW	1.00	1.50	U-LDPW60H