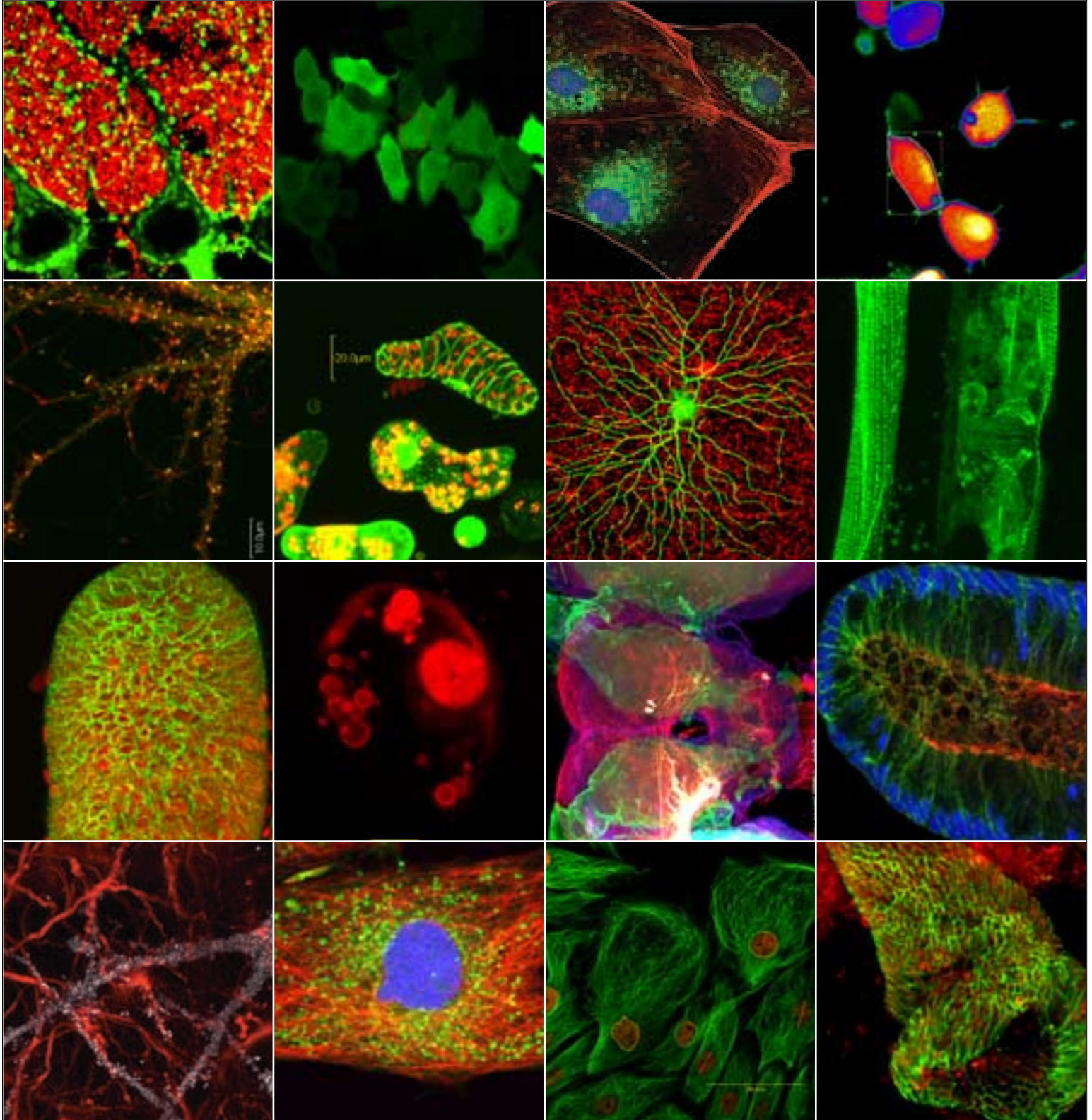


***CONFOCAL SCANNING IMAGES***

*UIS*  
UNIVERSAL  
INFINITY SYSTEM



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

The Fluoview FV300/FV500 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

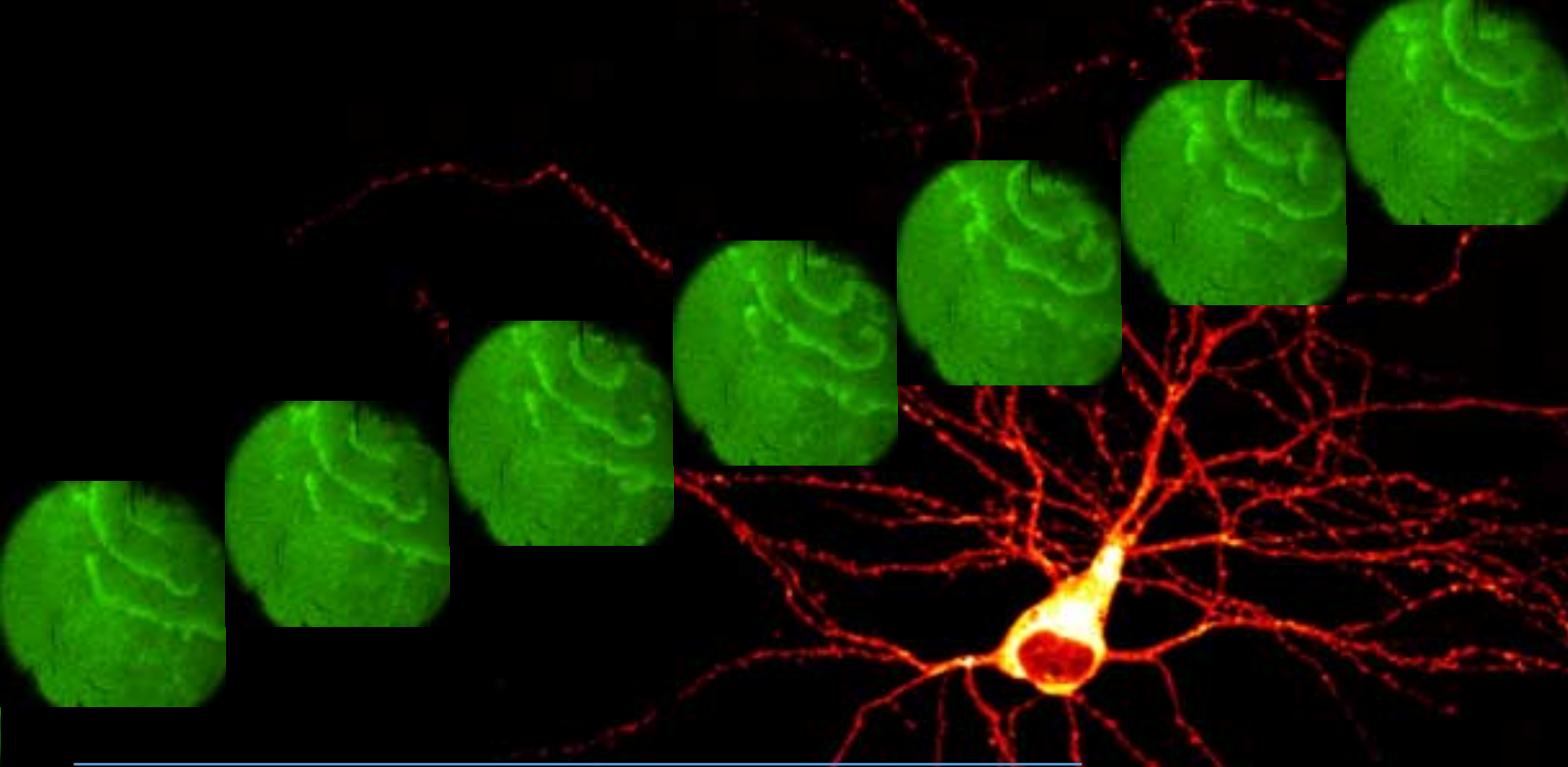
Highest image quality (12 bit, 2048x2048 pixel resolution) with economical cost

Simultaneous capturing of 2 fluorescence and 1 transmitted light detector images

Durable for the most demanding task with simple and efficient optical system

FV300+BX61WI+XY mover system:  
(BX61WI: fixed stage upright microscope)  
Ideal for physiological experiments,  
offering small enough to be placed in space  
on both sides





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

Complies with wide range of laser light sources from UV to near infrared lasers

•  
Up to 5 detectors (4 fluorescence and 1 transmitted light) available for simultaneous acquisition

•  
Fully motorized compact system when combined with BX61 or IX81

•  
Equipped with 3 laser port systems



FV500+IX81 back port system:  
(IX81: motorized system inverted microscope)  
Allowing the scanner to be placed at the back of the inverted microscope, with ample room on both sides

# Scanning Units

Superior expandability to accommodate future applications.

## 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.

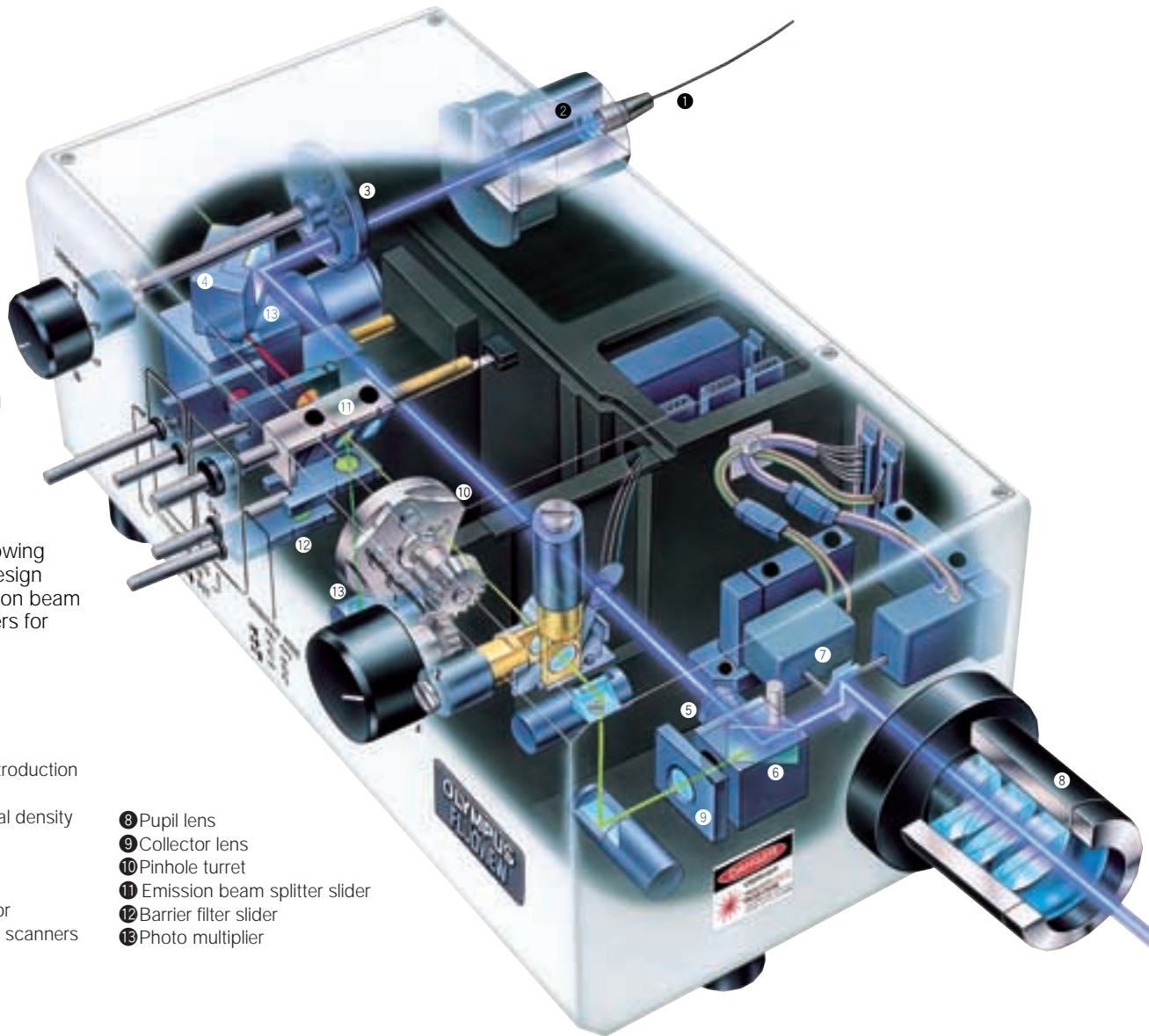
### Superior flexibility

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

## FV300

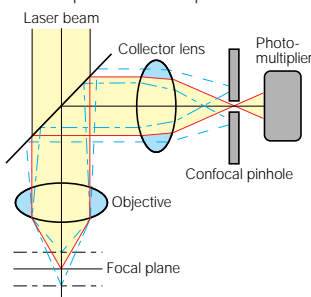
- ① Optical fiber for laser introduction
- ② Beam collimator
- ③ Laser adjustment neutral density filter turret
- ④ Dichroic mirror
- ⑤ Polarizer
- ⑥ Excitation dichroic mirror
- ⑦ XY galvanometer mirror scanners

- ⑧ Pupil lens
- ⑨ Collector lens
- ⑩ Pinhole turret
- ⑪ Emission beam splitter slider
- ⑫ Barrier filter slider
- ⑬ Photo multiplier



### 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.

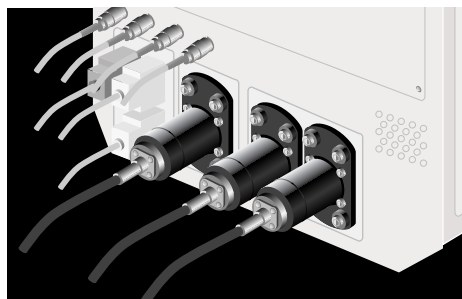


FV300	FV500
Up to 3 Channels	Up to 5 Channels
Visible Light Lasers — (IR Laser)	UV — Visible Light — IR Lasers
1 Laser Port	3 Laser Ports
Manual Operating Scanning Unit	Fully Automated Scanning Unit
5 Position Single Pinhole Turret	Individual Continuously Adjustable Pinholes
Automatic Laser Control (AOTF or ND) / 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

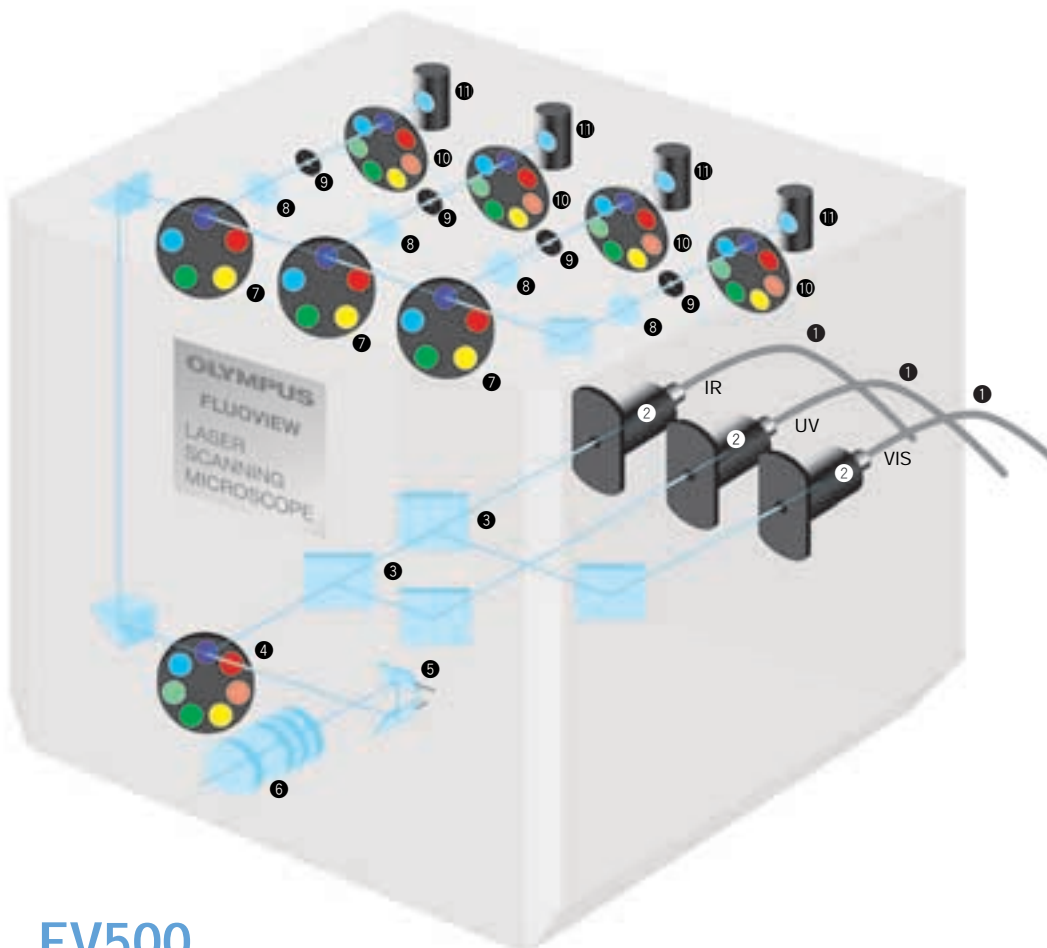
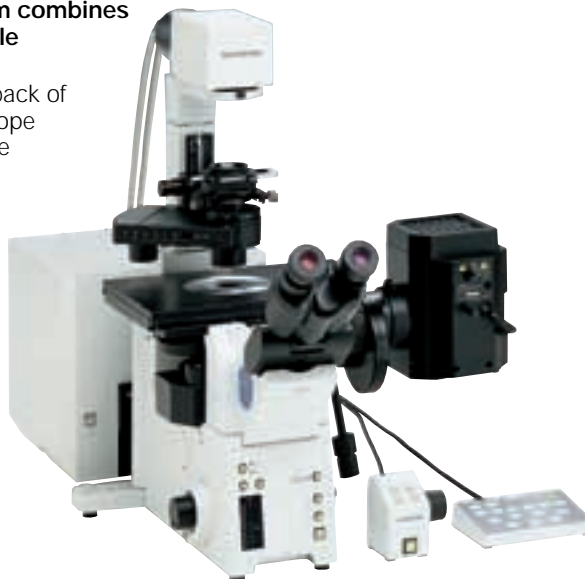
Olympus' unique design of barrier filters and dichroic mirrors for excitation and emission beam splitting allows easy exchange to adapt for specific needs of new applications.

### Shockless method

The FV500 scanner and special microscope tube feature a shockless operating method. For even greater effectiveness, they can be combined with the unique fixed stage & nosepiece focusing microscope BX61WI.

### FV500-IX81 back port system combines compact design with versatile performance

Positioning the scanner at the back of the motorized inverted microscope ensures plenty of working space on both sides of the microscope. Connection to the bottom and right-side ports makes it possible to use up to three video devices in addition to the scanner.



## 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 Collector lens
- ⑨ Adjustable Pinhole
- ⑩ Barrier filter turret
- ⑪ Photo multiplier

# Software Graphical User Interface

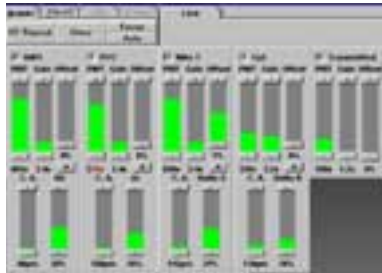
*Ultimate ease of operation and monitor display.  
The FV500 enables fully automatic image acquisition.*

## 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.



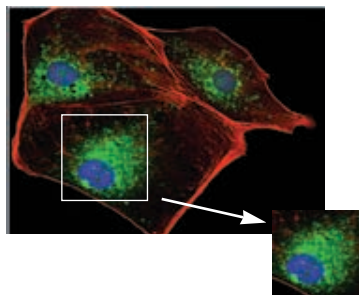
## Scan area: Graphic display, Pan and Zoom

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.

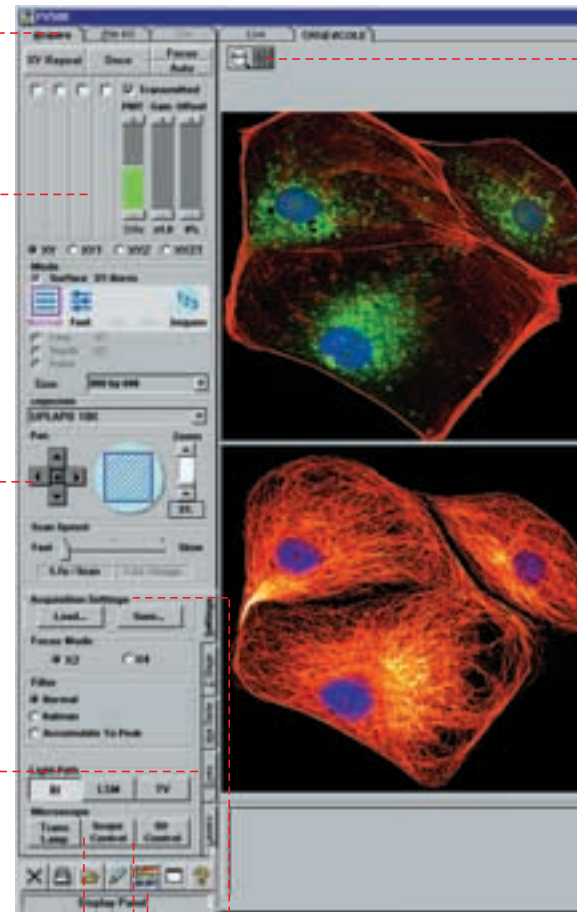


## Automatic operation of laser excitation and emission filters

Just choose the appropriate fluorescent dyes and the system will set up suitable filters and dichroic mirrors automatically (FV500). Automated microscopes such as IX81 and BX61 are also controlled by the same software. This automated features allow researchers to concentrate to their work.

## Registering operating conditions for individual researchers

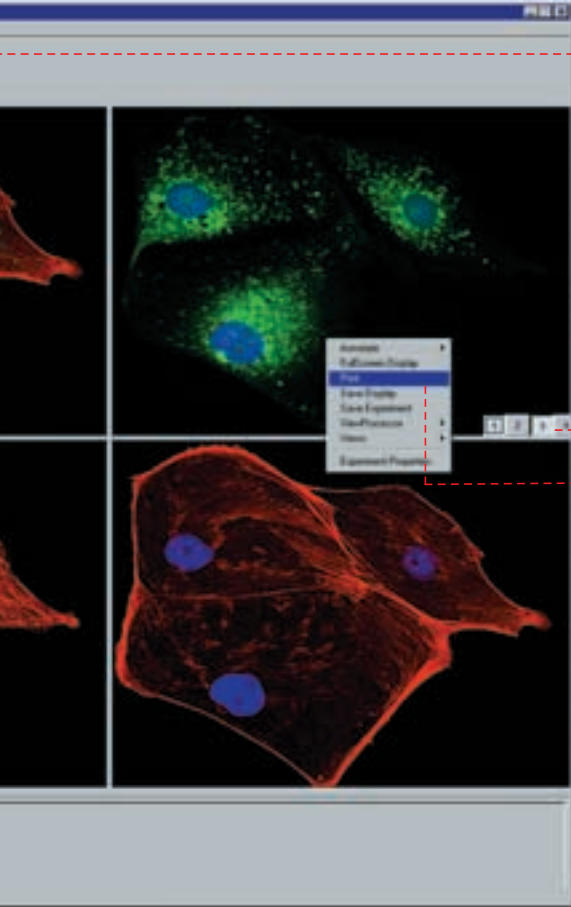
FV500's superior interface not only guarantees easy operation for beginners but also satisfies experienced researchers by its precise manual settings. In addition, each individual researcher's settings can be separately recorded and retrieved instantly — a real convenience when several researchers are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



## Microscope set-up monitor display



FV500



### 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.

### 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.

### Help function

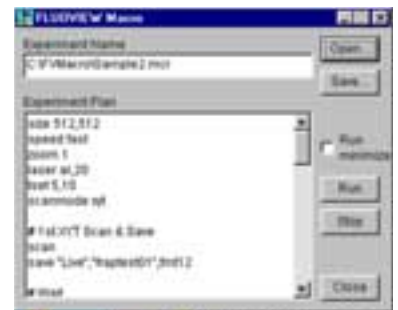
Online help allows the user to refer to individual functions and procedures while operating the applications. Supports are easy to see and understand — for instance, a light path exchange lever indicated by a flashing red light when setting up the microscope.

### 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.



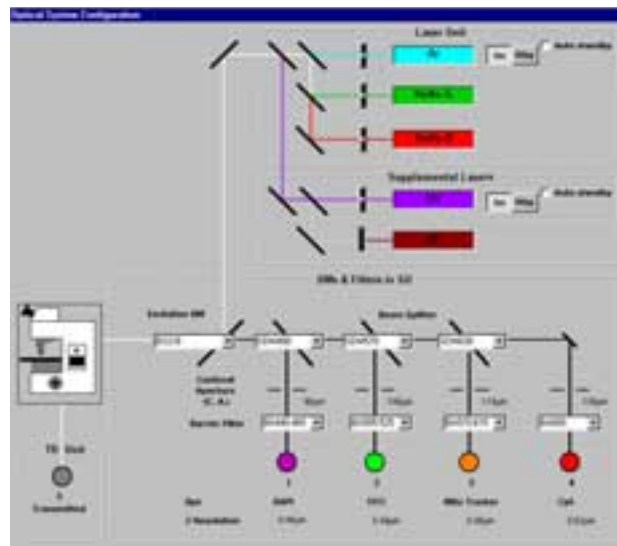
### Short-cut key

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

### Preset the conditions for image acquisition and loading

Preset storage and setting on a file of all the relevant image acquisition conditions enables immediate, one-touch recall. Adding new conditions or altering existing ones is quick and easy.

### Scanning unit set-up monitor display



FV500

### 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.

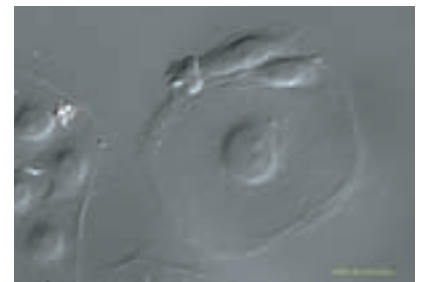
Icons simplify function identification: e.g. a color bar for pseudo-color processing through LUT editing, and a pencil for inserting comments on measurements and images.

### Software compensation filter for DIC background

The unevenness of DIC images can be compensated with a single click without any reference image. This function maintains every detail of the image.



Before compensation



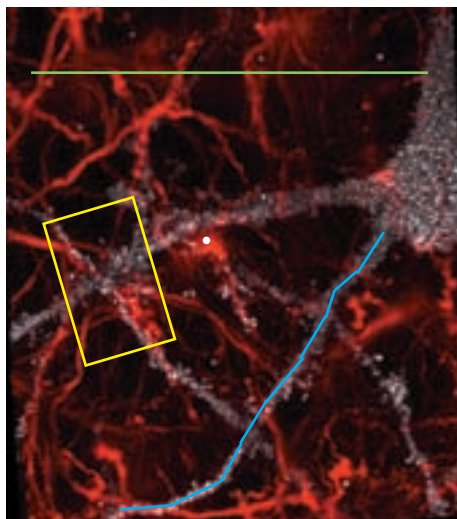
After compensation

# Scanning

Innovative scanning method for improved performance.

## Olympus efficient scanning modes

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



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



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.



### Rectangle scanning

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

Rect



### Point scanning

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

Spot



FreeLine

### Free line scanning

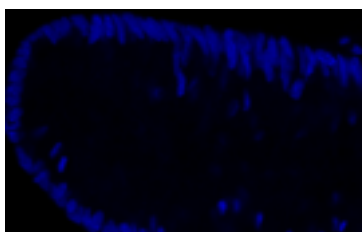
Intensity changes may be measured over a given period of time along the length of a freely drawn line, such as the trace of an axon or along a cellular junction.

## Sequential scanning to prevent cross talk

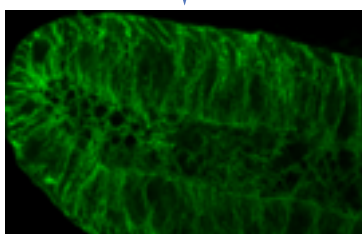
Sequential scanning is the technique to minimize the cross talk of the multi coloured samples between channels, by exciting each dye at a time.

The AOTF function (see page 11) enables line sequential scanning as well.

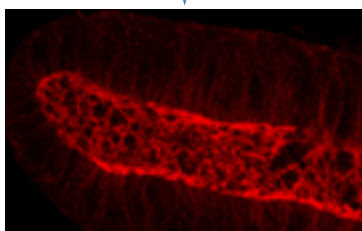
\* Setting before scanning: steps ①-④ can be performed by just one mouse click



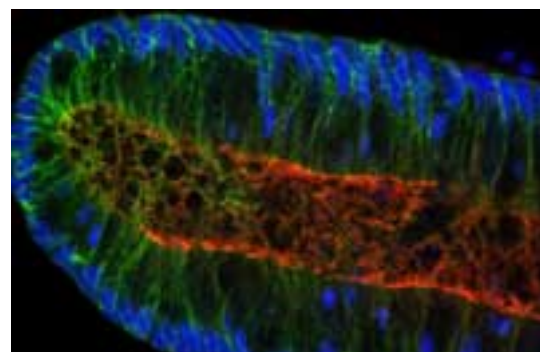
① Excited by only HeNe633



② Excited by only Kr568



③ Excited by only Ar488



④ Composition

### Human colon crypt

Nuclei (Blue) TO-PRO-3

Actin (Green) Alexa 488

APC gene product (Red) Alexa 568

Christine Anderson,

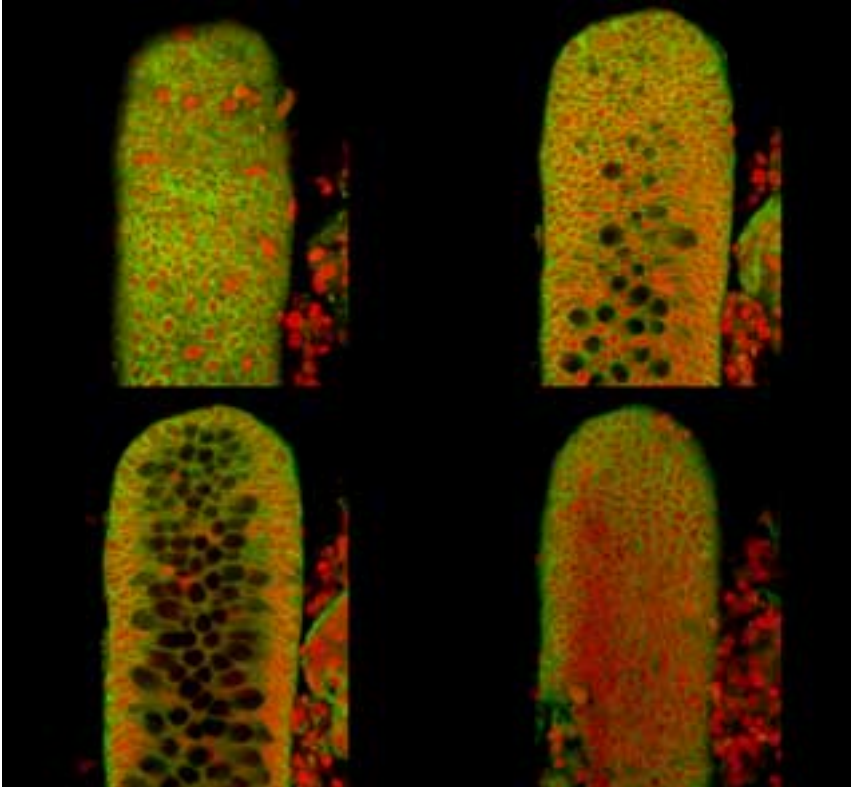
Laboratory of Prof. Ray White,

Huntsman Cancer Institute, Utah



# 3D Imaging

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



X-Y-Z



X-Y



X-Y-Z



Recto-Z



X-Z



Y-Z



SlantLine-Z

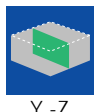
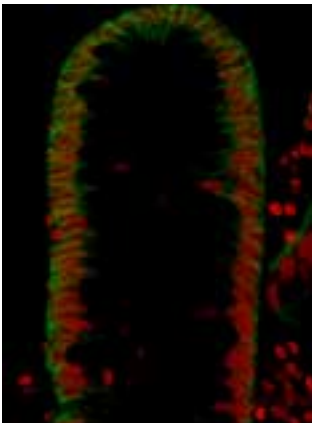


FreeLine-Z

X-Y-Z  
(Tile display)

## Easy Z axis operation and setting

The upper and lower limit of Z scanning can be specified interactively by actually scanning the sample or by direct input of the numerical value.



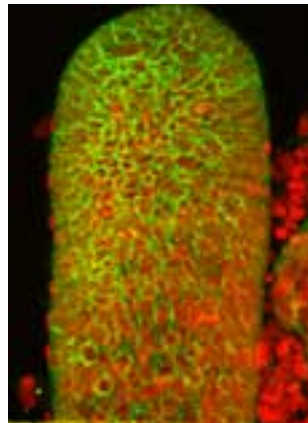
Y-Z

Y-Z  
(Cross-sectioning display)



X-Z

Y-Z (Cross-sectioning display)



3D display

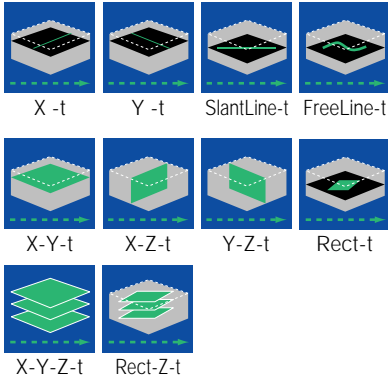
## Acquiring X-Y-Z and display X-Y cross sectional images quickly and continuously in increments of $0.01 \mu\text{m}$

Thank to the precision driving mechanism that enables  $0.01 \mu\text{m}$  step control, with motorized microscopes BX61, BX61WI and IX81, high quality continuous cross sectional images can be acquired. 3D function also provides extended focusing image, stereo view and 3D animation to explore the structure of the sample.

\*  $0.025 \mu\text{m}$  is the smallest increment for other microscope combinations.

# Time Course

Using different scanning modes to chart time-lapse changes efficiently

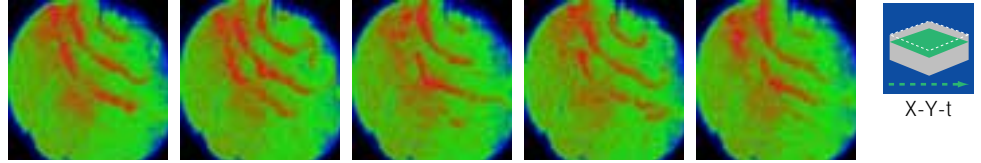


## High-speed (4 frames/sec) image acquisition

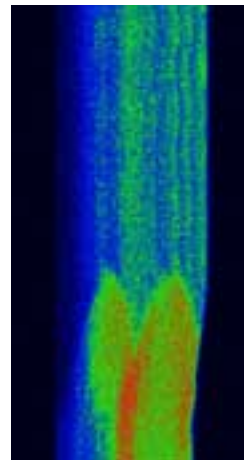
For the high speed observation of the sample, Fluoview is capable of scanning 4 frames per second in a fast scanning mode at an image size of 512X512. By limiting the image size, the frame rate will be even faster. This scanning mode is suitable for living cell observation.

## Versatile line scanning modes has many uses

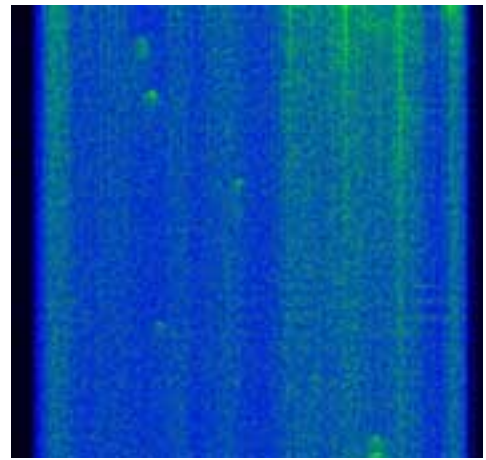
The wide variety of the line scanning modes (linear/oblique/free-line) enables flexible analysis of rapid time-lapse experiment.



Japan Science and Technology Corporation, Exploratory Research for Advanced Technology, Mikoshiba cell control project, Prof. Aya Muto



Dr. Sandor Gyorke, Texas Technical University



Dr. Sandor Gyorke, Texas Technical University

## Superior slice patching system

Using the FV300/500 in combination with unique fixed stage & nosepiece focusing upright microscope BX61WI provides a highly effective system for slice patching. This unique set up has small footprint that ensures enough room space limited cage. The remote control function will minimize the danger of accidental touching of the delicate experiment settings. Olympus also offers ideal non-cover glass long working distance water immersion objectives and optional movers that moves entire microscope system while sample and other experiment set up in a fixed position.

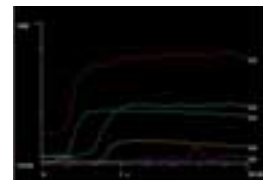
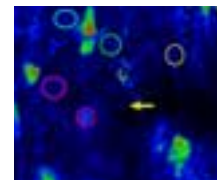
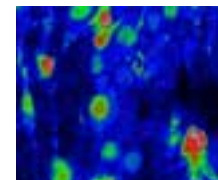
## Highly precise time-lapse analysis

Fluoview's wide dynamic range of 12-bit or 4096 grey levels gives enough precision to detect even slightest changes. The user can designate multiple regions of interest (ROI) by using drawing tools. The intensity or the ratio can be analysed with intuitive GUI driven program.



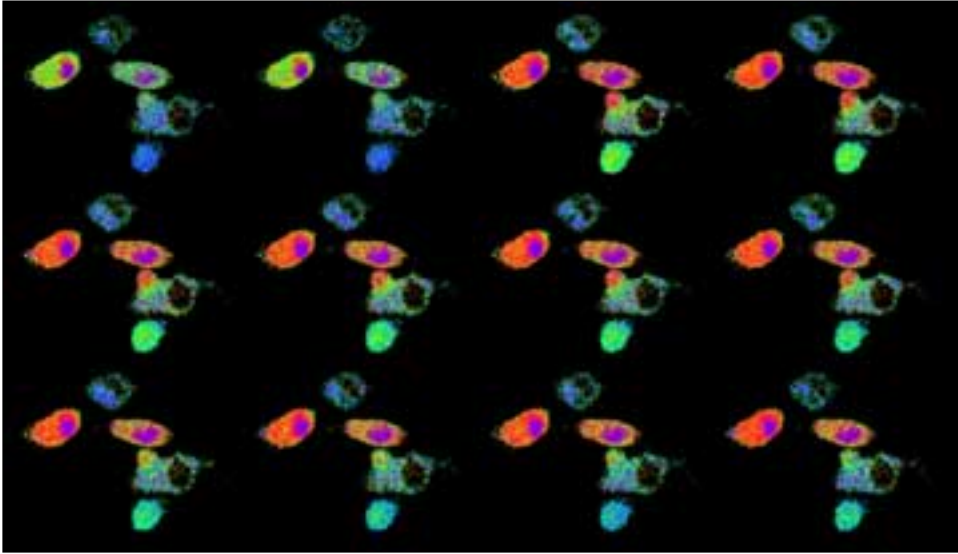
## Immersion-type LUMPLFL objectives

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 BX61WI (fixed stage & nosepiece focusing upright microscope) with water immersion objectives confocal imaging can be used to monitor time-lapse fluorescence changes in thick specimens such as brain slices.



# FRET

Hardware and software support to optimize the environment for FRET.



Ratio changes when cameleon is manifested on the HeLa cell and stimulated by histamine then inhibited by cyproheptadine.  
Cameleon genes provided by Dr. Miyawaki Atsushi in Brain Research Institute.  
Equipment: FV300 and HeCd laser  
Time period : 4 seconds.

## Helium-Cadmium (HeCd) laser can be added for CFP/YFP FRET imaging

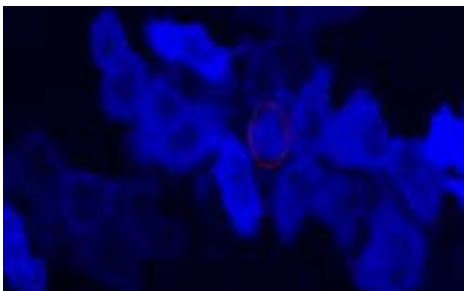
A Helium-Cadmium laser is optionally available for CFP/YFP imaging. 442nm of an HeCd laser ideally excites CFP, with minimum disturbance to YFP, and is therefore suitable for CFP/YFP FRET experiments.

The high performance LSM objectives, PLAPO40XWLSM and PLAPO60XWLSM, are precisely corrected in this wavelength range, and ensure the highest measuring reliability.

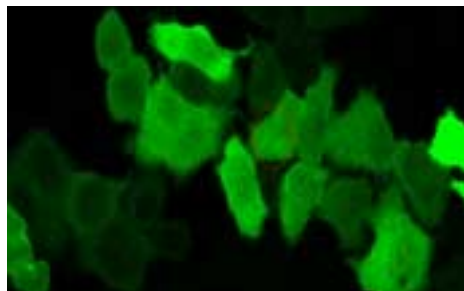
\*For simultaneous observation of CFP and YFP (442nm and 515nm are required.)

## Ratio imaging to analyze 2-wavelength images

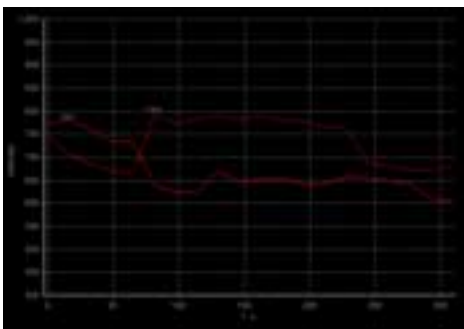
Using time course software, the ratio image can be continuously displayed in pseudo-color. At the same time, the intensity of each channel can be monitored graphically. The analyzing processes are presented as an instinctive flow chart. (optional time course software: TIEMPO)



CFP Fluorescence wavelength 485nm

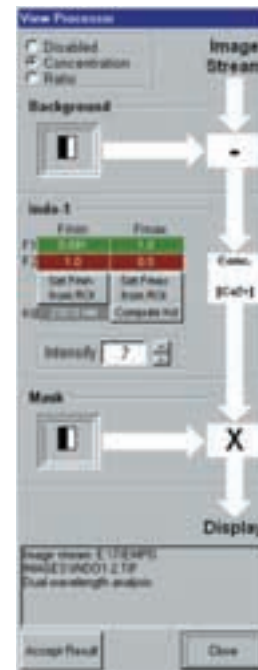


YFP Fluorescence wavelength 530nm



Measurement

CFP/YFP FRET  
Calcium ion concentration in a live HeLa cell using a cameleon (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.  
*Olympus Optical Co. Ltd.*



## Input/output of external trigger signal

The optional time course software gives control over the input/output trigger signal by GUI. It is suitable for combined experiments such as those involving patch clamping.

# AOTF

*AOTF: flexible control of the laser intensity to meet the specific demands*

## Minimal specimen fading

The laser exposure will be limited within the scanning area by default. Also there will be no laser exposure in the fly back motion of the galvanometer mirrors. Those features minimize the unnecessary bleaching of the specimen.

## Sequential line scanning for reduced cross talk

Individual lines can be scanned sequentially, minimizing the time difference between each wavelength and producing images with less cross talk.

## Any laser intensity for any excitation area ( "Region of Excitation" Mode )

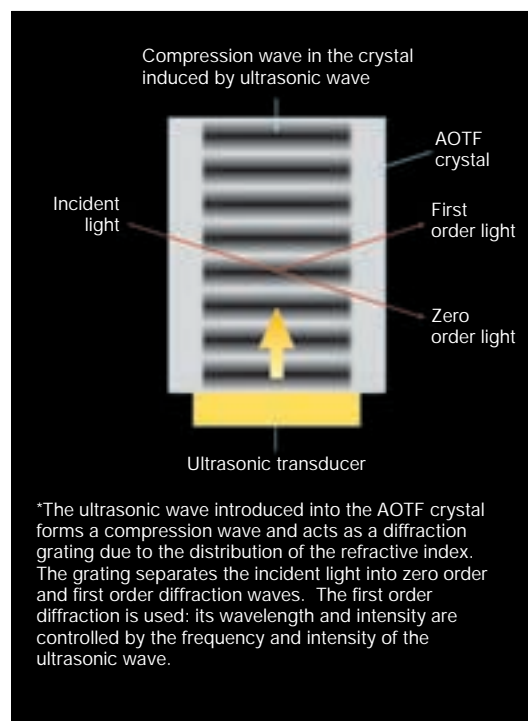
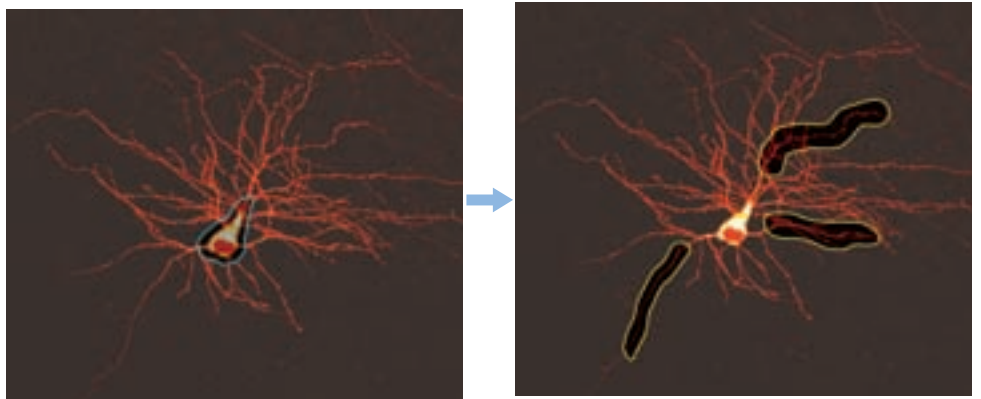
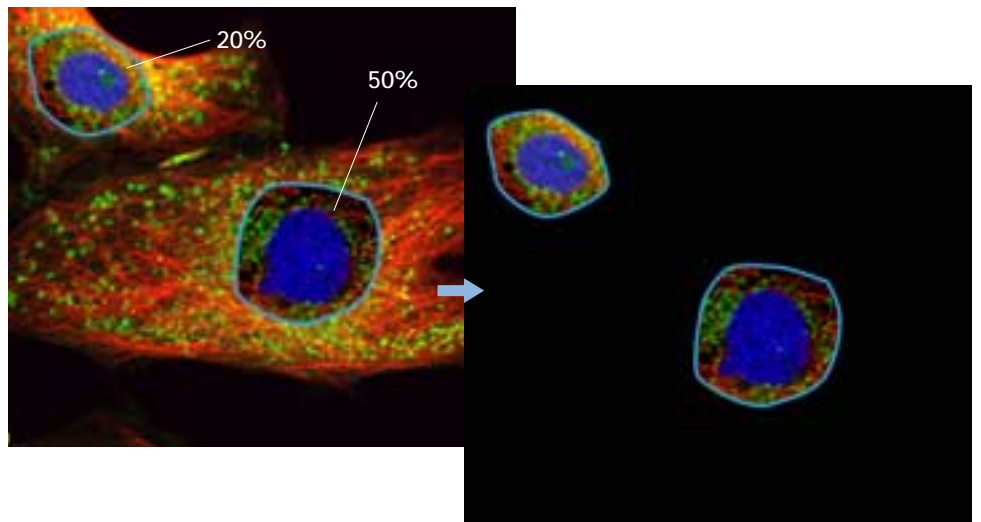
Users can designate several different areas on the specimen, and apply different laser intensities to each. Laser intensities can be set in 0.1 percent increments for each designated area. There is no limit to the number of areas which can be designated.

## Setting up multiple laser application patterns

Adding the time course software enables sequential time lapse observations, in which several application area patterns are combined. The freedom of bleaching area and intensity add even more variety to FRAP experiments.

## AOTF controller: easy to link with external equipment

This controller has input/output trigger terminals on the back and can synchronize laser application with the experiment being performed. It also allows the user to monitor laser intensity levels.

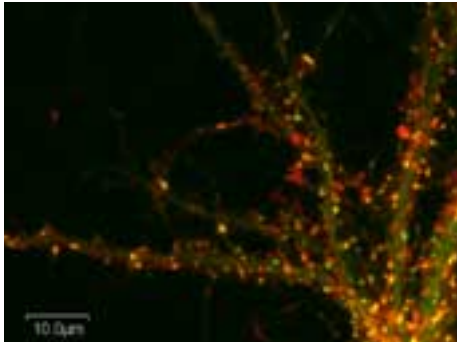


AOTF is an acoustic-optical element which controls light intensity by directing acoustic waves onto special crystals. Its principal feature is its high speed control of the light intensity. The AOTF system employed in the LSM (Laser Scanning Microscope) uses multiple acoustic frequencies to control each laser wavelength independently.



# Applications Gallery

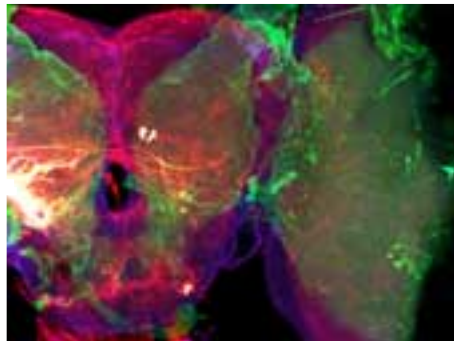
## Neuron



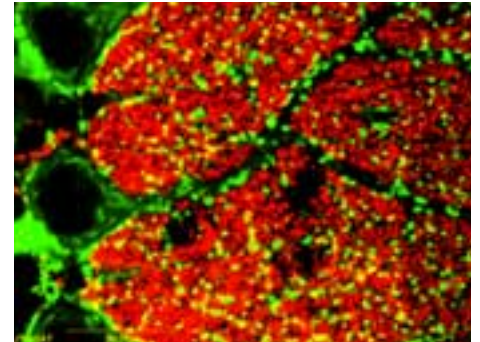
Mouse:hippocampal neurons  
green channel: a GFP-tagged postsynaptic density protein, red channel: actin staining using rhodamine-phalloidin  
Hippocampal neurons expressing a GFP-tagged postsynaptic density protein were fixed and stained with rhodamine-phalloidin to visualize the localization of cytoplasmic actin filaments. In dendrites, actin filaments are concentrated in the postsynaptic sites.  
Shigeo Okabe  
Department of Anatomy and Cell Biology  
Tokyo Medical and Dental University



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

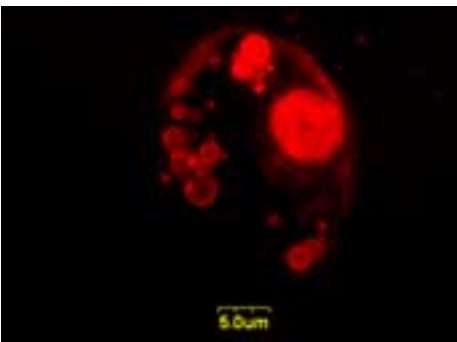


Lucifer yellow injected visual interneurons of swallowtail butterfly  
Extended focus is used for every 100μm on 383μm Z-range image and displayed by overlapping pseudo colors  
Mituyo Kinoshita, Pr. Kentaro Arikawa  
Laboratory of Neuroethology, Graduate School of Integrated Science, Yokohama City University

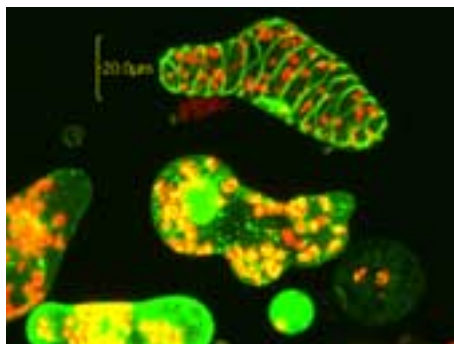


Purkinje cell in the rat cerebellum  
FITC: vesicular GABA transporter VGAT  
Cy3: vesicular glutamate transporter VGLUT1  
Pr. Masahiko Watanabe  
Department of Anatomy,  
Hokkaido University School of Medicine

## Plant

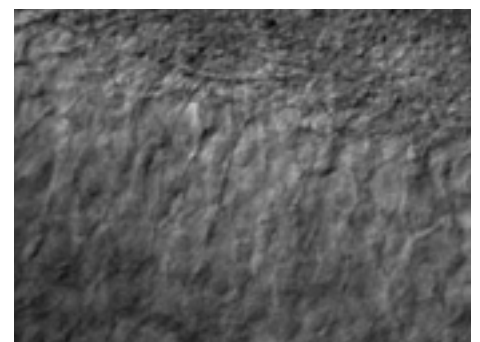


Apoptosis of Tobacco hybrid plant cells  
Dr. Wataru Marubashi  
Laboratory of Plant Breeding and Cell Engineering,  
School of Agriculture,  
Ibaraki University



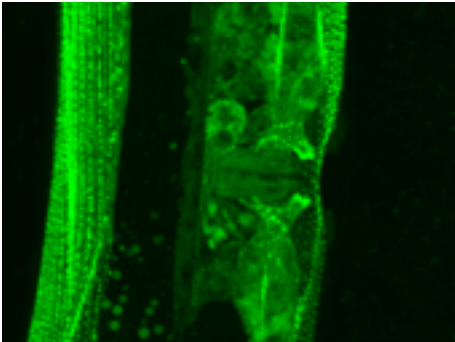
Isolated Zinnia mesophyll cells  
Keisuke Obara  
Pr. Hiroo Fukuda  
Department of Biological Sciences,  
Graduate School of Science,  
The University of Tokyo

## IR

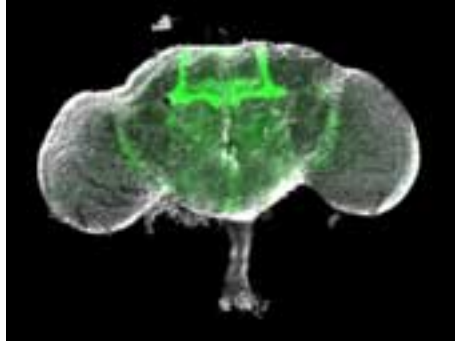


IR DIC image by 750nm near infrared laser  
Human skin tissue  
Depth: Approx. 80μm

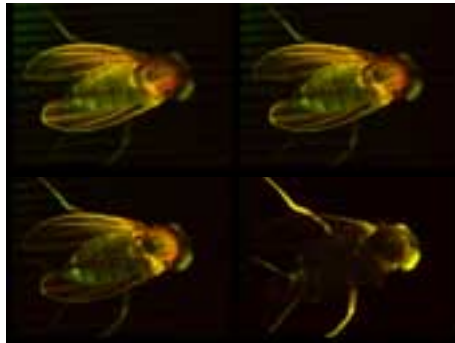
# Fluorescent Proteins



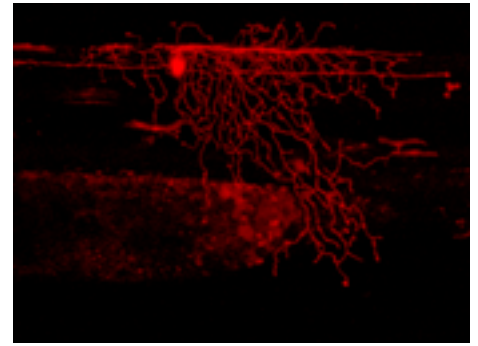
C elegans expressing beta-integrin fused to GFP  
*Dr. Xioping Xhu and Dr. John Plenefisch*  
*University of Toledo, Dept. of Biology*



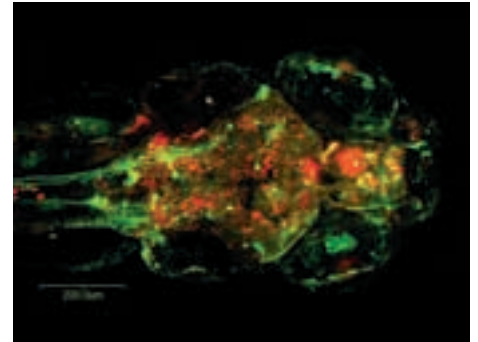
GFP-labeling of Drosophila adult brain with staining of mushroom bodies  
*Assistant Prof. Aigaki*  
*Cytogenetics*  
*Tokyo Metropolitan University, Science Dept.*



GFP-labeling of Drosophila adults

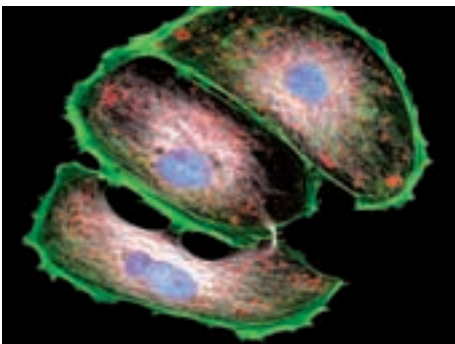


Expression of DsRed in a zebrafish embryo  
 Extended focus image of 5µm x 30 slice  
*Pr. Yasuhiro Kamei, Pr. Shunsuke Yumiba*  
*Institute for Molecular and Cellular Biology*  
*Osaka University*

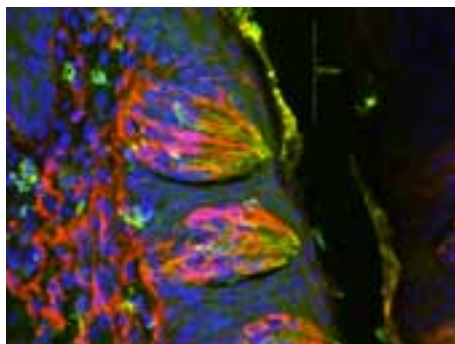


Coexpression of EGFP and DsRed in a zebrafish embryo  
 Extended focus image of 10µm x 28 slice  
*Pr. Yasuhiro Kamei, Pr. Shunsuke Yumiba*  
*Institute for Molecular and Cellular Biology*  
*Osaka University*

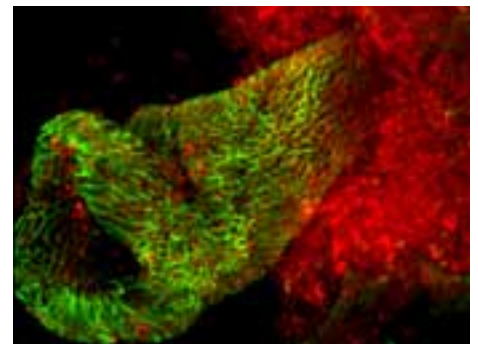
# Morphology



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



Rat tongue taste bud  
 DAPI: Nuclei  
 FITC: TrkB, high-affinity receptor for brain-derived neurotrophic factor  
 Texas Red: Protein Gene Products  
*Pr. Shigeru Takami*  
*Department of Anatomy,*  
*School of Health Science,*  
*Kyorin University*



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

# System components

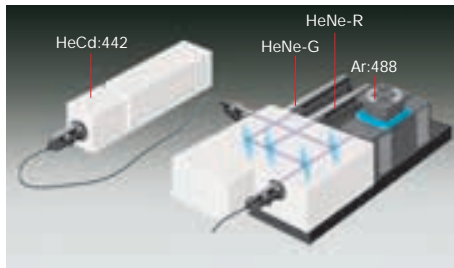
## Different types of laser combiners

Selectable from ND filter or AOTF combiner. The shutters and light intensity can be controlled via the Fluoview system computer.

\* Laser combiner for AOTF is indispensable with multi-Ar laser.



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



Combiner for CFP/YFP FRET



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



Laser combiner with UV laser system

\* Please consult your Olympus dealer for other combinable lasers.

## External transmitted light detector system and fluorescence illumination system

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 system

\* Standard equipment with FV500-BX61/BX61WI, FV300-BX51, BX61 and BX61WI combination

# Objectives

## Special objectives for LSM (visible area)

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

## New unique objective for UV confocal imaging (UV area)

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	0.14mm
UVAPO40XWLSM	0.9	0.12mm

Cover glass thickness range: 0.17±0.01mm

## Clear depth observation by using special near-infrared objectives with IR laser light (Visible-Infrared area)

The UPLAPO60XW/IR water immersion objective is corrected for wavelengths from 450nm to 1,100nm. Simultaneous IR-DIC observation is obtained, with no chromatic aberration between the visible fluorescence and IR DIC images. The IR laser port of the FV500 has a straight optical feature without reflection.

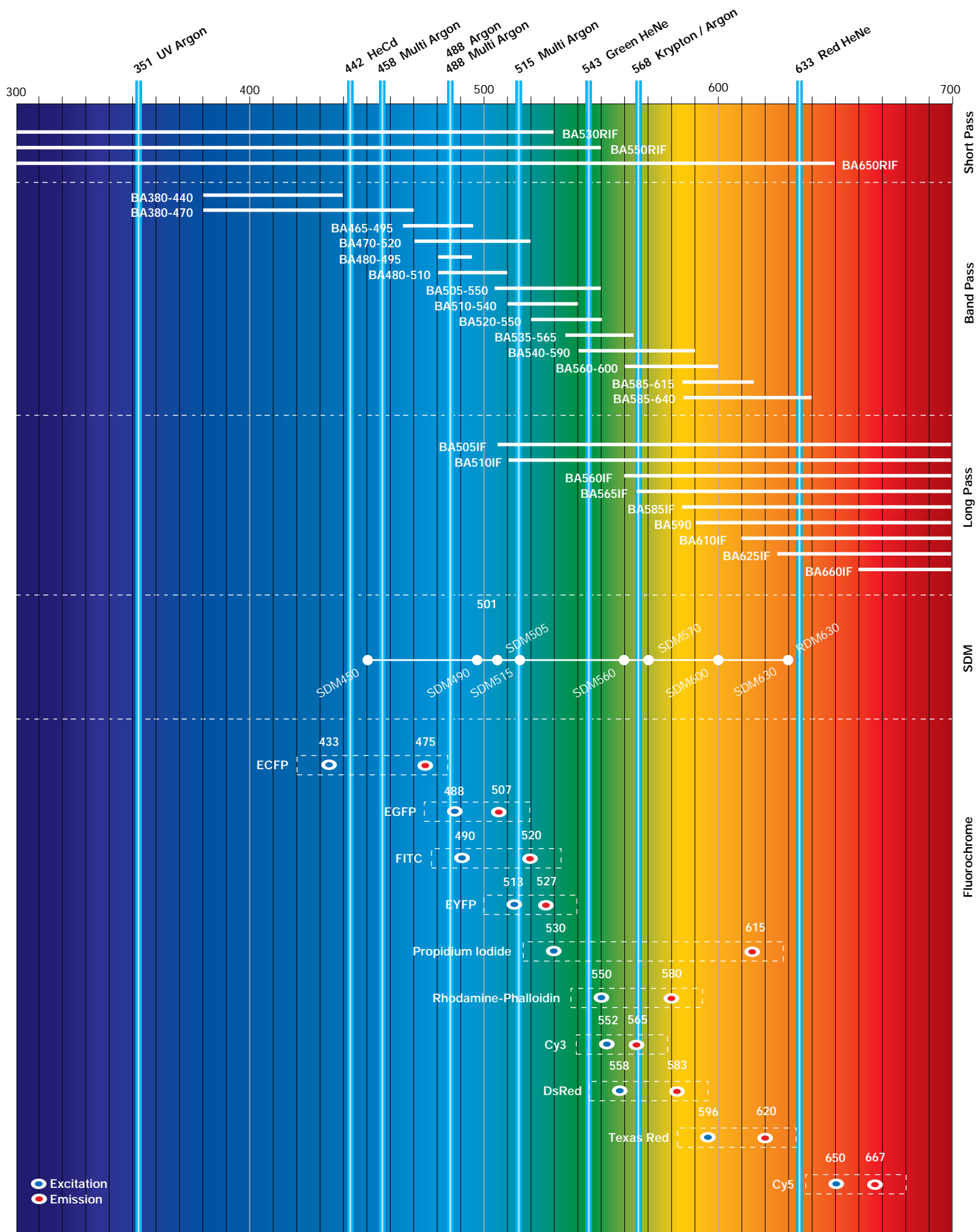


Objective	N.A.	W.D. (mm)
UPLAPO60XW/IR	1.2	0.28

Cover glass thickness: 0.13-0.21mm



# Fluorescence Dyes



## Specifications

		FV300	FV500
① Laser light source	Visible light laser source	Select from the following laser and to be mounted on laser combiner: Multi Ar laser (458nm, 488nm, 515nm, Total 40mW), Ar laser (488nm, 10mW), Kr laser (568nm, 10mW), HeNe (G) laser (543nm, 1mW), HeNe (R) laser (633nm, 10mW), HeCd (Helium cadmium) Laser (442nm 6mW)	
	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 or AOTF 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: 256 x 256 (0.45s) - 2048 x 2048 (10.835s) (Simultaneous scanning up to 5 channels) Bi-directional high-speed scanning mode: 512 x 512 (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	Automatic selection
	Scanning modes	1-dimension: Point scanning 2-dimension (space): X-Y, rect, 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 rect-Z 3-dimension (time): X-Y-t, X-Z-t and rect-t 4-dimension: X-Y-Z-t and rect-Z-t	
	Image depth resolution	12-bit (=4096 grey levels) per channel	
	Zoom	1X-10X (0.5X-step)	
	Z-drive	Step motor/Minimum step 10nm (BX61, BX61WI and IX81 combination), 25nm (other microscope combination)	
③ Microscopes	Upright	BX51, BX61, BX61WI	
	Inverted (special laser safe frame)	IX81FVSF, IX71FVSF (side port)	IX81FVBF/IX81FVBFUV (back port), IX81FVSF/IX71FVSF (side port)
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 Standard equipment of FV500-BX61, FV500-BX61WI, FV300-BX51, FV-300-BX61, FV300-BX61WI	
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, Windows 2000/Memory: 1GB RAM or larger, CPU: Pentium® 4 1GHz or higher, Hard disk: 40GB or larger, Special I/F board, Image acquisition: PCI bus, Monitor: Selectable from 21, 19, 17-inch, 1280 x 1024, Full color (16.77million colors)		
⑦ Fluoview application software	Image acquisition	Scanning condition setting: image size, scanning speed, zoom, panning etc. Real-time image calculation: Kalman filtering, peak integration, PAPP (Programmable Acquisition Protocol Processor)	
	Hardware control	Laser, scanning unit, microscope	
	Image display	Each image display: Single-channel side-by-side, merge, cropping, tiling, series (Z/T) pass and continuous LUT: Individual color setting, pseudo-color Overlay: Lines, text, scale bar, etc	
	Image processing	Individual filter: Average, Low-pass, High-pass, Sobel, Median, Prewitt, 2D Laplacian, edge enhancement etc. Calculations: Inter-image, mathematical and logical, DIC back ground leveling	
	Image analysis	Overview of fluorescence intensity within an area, histogram, perimeter measurement for user-assigned area, time-lapse measurement, etc. TIEMPO (Time course software)	
	3D visualization	3D animation, left / right stereo pairs, red / green stereoscopic images and cross section	
	Others	Graphic-based help, time course software (optional), trigger IN/OUT function (optional), 3D software / LSM viewer (optional)	
Power consumption	Microscope (115V 6A/230V 3A), scanning unit+PSU (115V 3.5A/230V 2A), computer & monitor (115V 4.5A/230V 10A), Ar laser (115V 10A/230V 5A), Multi Ar laser (115V 10A/230V 5A), Kr laser (230V 20A), HeNe laser each (115V 0.4A/230V 0.2A), UV laser (230V 30A), IR laser (115V 1A/230V 0.5A), HeCd laser (115V 5A/230V 3A)		

### Objectives for AX/BX (using U-UCD8, U-DICTS)

Objective	N.A.	W.D.	DIC prism	U-DICTS position
UPLFL10X	0.30	10.00	U-DP10	Normal
UPLAPO10X	0.40	3.10	U-DP10	Normal
UPLFL20X	0.50	1.60	U-DP20	Normal
UPLFL40XO	1.3	0.10	U-DPO40S	BFP1
UPLAPO20X	0.70	0.65	U-DPA20	Normal
UPLAPO40XO12	0.50-1.00	0.12	U-DPO40S	BFP1
UPLAPO40X	0.85	0.20	U-DPA40	Normal
UPLFL60XO	0.65-1.25	0.10	U-DPO60S	Normal
PLAPO60XO2	1.40	0.15	U-DPO60S	BFP1
UPLAPO100XOI	0.50-1.35	0.10	U-DP100	Normal
PLAPO40XWLSM	0.90	0.15	U-DPAW40 LSM	Normal
PLAPO60XWLSM	1.00	0.15	U-DPAW60 LSM	Normal
APO20XWLSM/UV	0.4	0.14	—	Normal
APO40XWLSM/UV	0.9	0.12	—	Normal
UPLAPO60XW	1.2	0.31-0.25	U-DPO60S	Normal
UPLAPO60XW/IR	1.2	0.31-0.25	U-DPO60S	Normal

### Objectives for IX (using IX-LWUCD, U-DICTS)

Objective	N.A.	W.D.	DIC prism	U-DICTS position
UPLFL10X	0.30	10.00	IX-DP10	Normal
UPLAPO10X	0.40	3.10	IX-DP10	Normal
UPLFL20X	0.50	1.60	—	Normal
UPLAPO20X	0.70	0.65	IX-DPA20	Normal
UPLFL40XO	1.3	0.10	IX-DPO40S	BFP1
UPLAPO40X	0.85	0.20	IX-DP40	Normal
UPLAPO40XO12	0.50-1.00	0.12	IX-DPO40S	BFP1
UPLFL60XOI	0.65-1.25	0.10	IX-DPO60S	Normal
PLAPO60XO2	1.40	0.15	IX-DPO60S	BFP1
UPLAPO100XOI	0.50-1.35	0.10	IX-DP100	Normal
UPLAPO60XW	1.2	0.31-0.25	IX-DPO60S	Normal
PLAPO40XWLSM	0.90	0.15	IX-DPAW40 LSM*	Normal
PLAPO60XWLSM	1.00	0.15	IX-DPAW60 LSM*	Normal
APO20XWLSM/UV	0.4	0.14	—	Normal
APO40XWLSM/UV	0.9	0.12	—	Normal
UPLAPO60XW/IR	1.2	0.31x0.25	IX-DPO60S	Normal

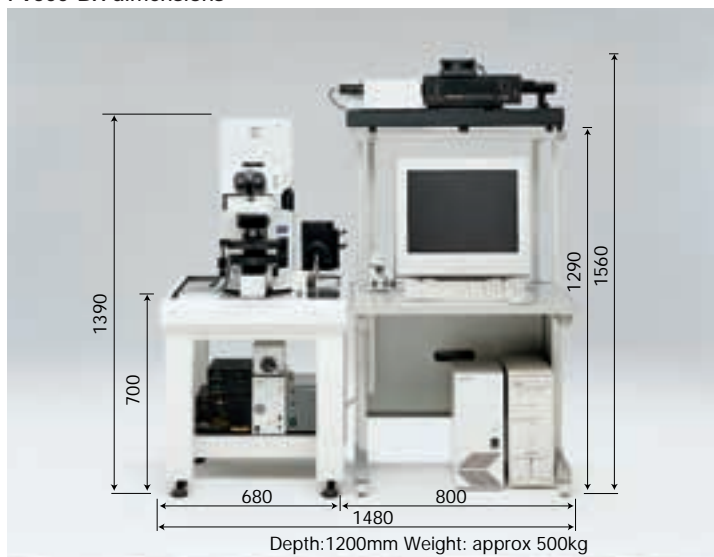
\* Custom-made product

### Objectives for fixed stage upright microscopes (using WI-UCD, WI-DICTHRA)

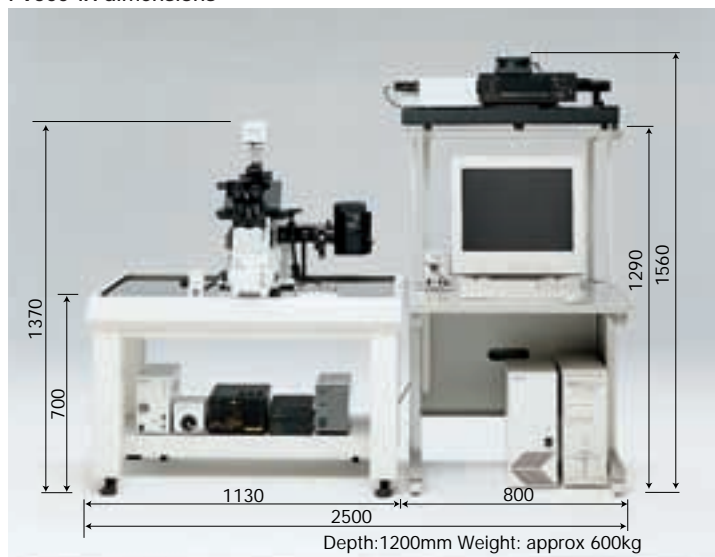
Objective	N.A.	W.D.	DIC prism	Revolving nosepiece
MPLSX	0.1	19.60	—	WI-SSNP, WI-SRE2
UMPLFL10XW	0.30	3.30	U-LDPW10H	WI-SSNP, WI-SRE2
UMPLFL20XW	0.50	3.30	U-LDPW20H	WI-SSNP, WI-SRE2
LUMPLFL40XW	0.80	3.30	U-LDPW40H	WI-SSNP, WI-SRE2
LUMPLFL60XW	0.90	2.00	U-LDPW60H	WI-SSNP, WI-SRE2
LUMPLFL40XW/IR	0.80	3.30	U-LDPW40H	WI-SSNP, WI-SRE2
LUMPLFL60XW/IR	0.90	2.00	U-LDPW60H	WI-SSNP, WI-SRE2
LUMPLFL100XW	1.00	1.50	U-LDPW60H	WI-SSNP, WI-SRE2
XLUMPLFL20XW	0.95*	2.00	U-LDPXLU20 HR	WI-SNPXLU

\* Note: These conditions are not met in confocal microscopy

**FV500-BX dimensions**

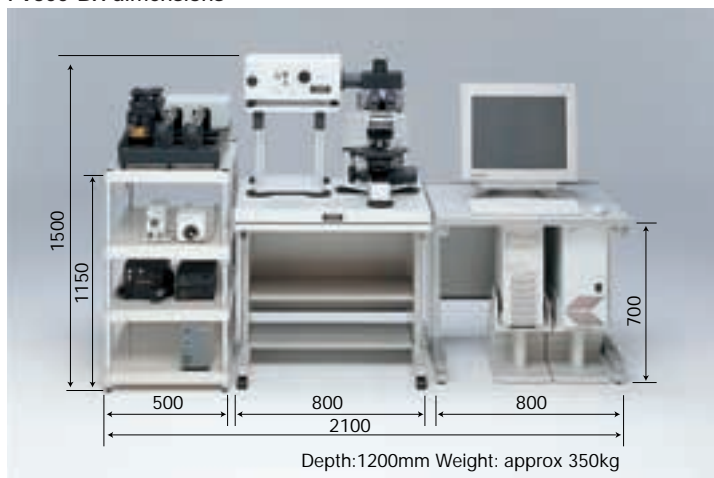


**FV500-IX dimensions**

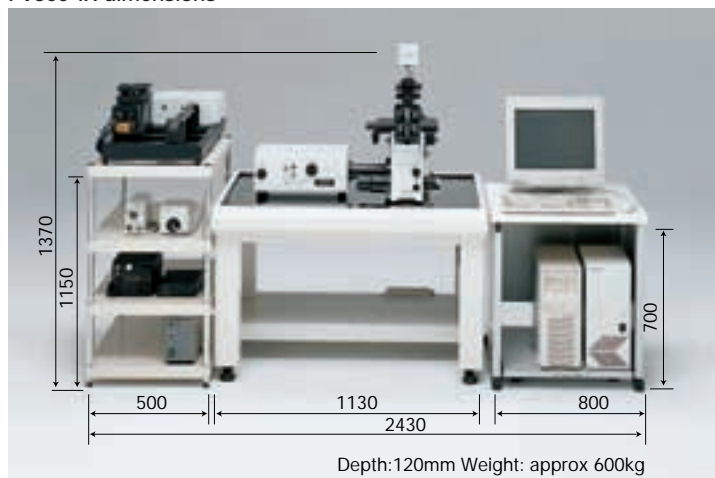


● Photos shown above are setting example using custom-made laser rack. Standard laser rack is shown below.

**FV300-BX dimensions**



**FV300-IX dimensions**



- 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 OPTICAL CO.,LTD.**  
 San-Ei building, 22-2, Nishi Shinjuku 1-chome, Shinjuku-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 BUSINESS AREAS



www.olympus.com