CONFOCAL LASER SCANNING BIOLOGICAL MICROSCOPES

FV300
FLUOVIEW
The FV300 is the ideal choice of laser scanning microscopes for personal users. Its optical system is fully integrated, from scanner to microscope, and not only delivers outstanding optical sectioning, but also ensures the easy, flexible expandability required for any future upgrade.

With its wide choice of options and configurations, including the Olympus inverted, upright and fixed-stage upright microscope platforms, the FV300 offers excellent versatility as well as top-class laser scanning performance.

- Highest image quality (12 bit, 2048x2048 pixel resolution) with economical cost
- Easy operation, with user-friendly software
- Simultaneous capture of 2 fluorescence and 1 transmitted light detector images
- Capable of the most demanding tasks, with a direct and efficient optical system
- Optical system chromatically corrects aberrations from UV to NIR (near infrared red) spectrum
- Fiber illumination system separates fluorescence and transmitted light sources from the microscope body for improved temperature stability
Optical fiber for laser introduction
Beam collimator
Polarizer
Dichromatic mirror
Excitation dichromatic mirror
XY galvanometer mirror scanners
Pupil lens
Collector Lens
Pinhole turret
Emission beam splitter slider
Barrier filter slider
Photo multiplier
Software Graphical User Interface

Ultimate ease of operation and monitor display.

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

Versatile display options
Exchange between condensed and full image display modes can be performed with a single touch. Individual panel layouts can be changed at will, and the panel in use can be placed in any desired position.

Simplified toolbar
A newly designed toolbar with various dedicated buttons has greatly improved ease of use. The user can execute a succession of selected processes with one-click operation for each.

Flexible setting of scanning size, zoom, movement and rotation
The observation field and scanning area are both displayed graphically. Settings can be confirmed while scrolling through the zoom ratios. The "pan" button lets the operator move the image acquisition area at will, and rotation scanning of images is also possible.

Preset the conditions for image acquisition and loading
Storage of Acquisition Settings enables immediate, one-touch recall of all the relevant experimental settings and conditions. Adding new conditions or altering existing ones is quick and easy.

Flexible scanning:
- **ZoomIn scanning**: Scan over any designated rectangular area. Since only the region of the targeted, zoomed-in area is acquired, scan time and laser exposure of the specimen is minimized.
- **Point scanning**: The ultimate in fast scanning, the point scan enables accurate quantitation of intensity changes during rapid physiological events.
- **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.
- **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.
- **Clip scanning**: By cropping the image, selected areas can be cut out of complex image stacks.

AOTF: flexible control of the laser intensity to meet the specific demands (optional)
The laser exposure will be limited within the scanning area by default, minimizing unnecessary bleaching of the specimen. Option includes:
- Any laser intensity for any excitation area ("Region of Excitation" mode)
- Multiple laser applications
- AOTF controller that provides easy link with external equipment

Innovative scanning method for improved performance
ZoomIn scanning

ZoomIn

Point scanning
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Ultimate ease of operation and monitor display.
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.

Data stored in the gallery window are displayed as thumbnails for easy viewing.

Sequential scanning to prevent cross talk
Sequential scanning may be used to minimize the fluorescence cross talk often seen between channels in multicolored samples. This is achieved by exciting each fluorochrome independently, one dye at a time. With the AOTF function, line sequential scanning is available as well.

* Once optimized: steps 1-4 can be performed easily

Tiling display function for see-at-a-glance comparison of multiple images
The FV300’s live tiling function, which is especially valuable in time course experiments, allows observations of multiple images or changes in the specimen while the experiment is in progress. Images in series (e.g. XYt or XYZ) can be freely displayed.

Easy exchange between display methods
Independent navigation bars for each image window enable the display method to be changed quickly and easily.

Thumbnail display
Single monitor display is also possible.

Scanning unit set-up monitor display

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**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 have many uses**

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

**Superior slice patching system**

In combination with the unique fixed stage & nosepiece focusing BX61WI microscope, the FV300 provides a highly effective system for slice patching. This unique setup has a small footprint for increased room in a space-limited cage. The remote control microscope options minimize the danger of accidentally touching the delicate experimental settings. Olympus also offers ideal non-cover glass long working distance water immersion objectives and an optional XY translation stage that moves the entire confocal microscope system while the sample and other experimental hardware remains in a fixed position.

**Highly precise time-lapse analysis**

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

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**Calcium wave in Xenopus oocyte, Calcium Green staining, fluorescence pseudo-colored fluorescence image after injection of inositol 3-trisphophate**

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

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**Calcium wave in isolated cardiac myocyte**

Dr. Sandor Gyorke
Texas Technical University

**Calcium sparks in isolated cardiac myocyte**

Dr. Sandor Gyorke
Texas Technical University

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**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.

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**BX61WI fixed stage upright microscope+translation stage**

Long working distance, non-cover glass water immersion objective
The 440nm diode laser can be added for CFP/YFP FRET imaging. A 440nm diode laser is optionally available for CFP/YFP imaging. The 440nm laser line ideally excites CFP, with minimal disturbance to YFP, and is therefore suitable for CFP/YFP FRET experiments. The high performance LSM objectives, PLOAPO40XWLSM and PLOAPO60XWLSM, are precisely corrected in this wavelength range, and ensure the highest measuring reliability.

*For simultaneous observation of CFP and YFP, 440nm and 515nm laser lines 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 analysis process is presented as an intuitive flow chart. (optional time course software: TIEMPO)

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.

**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.

**FRET**
Hardware and software support to optimize the environment for FRET.

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**CAMELEON**
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 proheputadine.
PAPP for FRAP Application

PAPP: Programmable Acquisition Protocol Processor
Easy, reliable flow of experiments for fluorescence recovery after photobleaching.

AOTF and PAPP function for effective FRAP (Fluorescence Recovery After Photobleaching)
Fluorescence recovery after photobleaching can be analyzed on any designated area by means of the AOTF-equipped laser combiner. During the processes of photobleaching and recovery, the PAPP function enables time scales to be freely and easily programmed to suit different experiment purposes.

New PAPP (Programmable Acquisition Protocol Processor) makes it easy to program a wide range of experiments
Using the new PAPP function, which is included in standard software, the experiment protocol is created by describing the individual steps or phases within the experiment. Users can specify detailed conditions and parameters for each step. This function enables users to construct complex experimental protocols with minimal effort. PAPP is suitable, for example, for FRAP experiments that require more flexibility.

Mouse; hippocampal neurons; fluorescence of GFP
Living neurons expressing GFP were maintained in culture and fluorescent images were obtained. Subsequently, FRAP analysis was performed on the same cell to determine the diffusion rate of GFP proteins into the dendritic spines. Rapid fluorescence recovery (within seconds) was observed.
Shigeo Okabe
Department of Anatomy and Cell Biology
Tokyo Medical and Dental University

Fluorescence quantitation
Line graph depicting average fluorescence intensity versus time.

Fluorescence Baseline
Photobleaching at 0.22 sec interval
Fluorescence recovery at 0.32 sec interval
Multi-point time lapse system

High-magnification multi-point time lapse observation of living cells.

Wide-ranging specimen observations for improved experiment throughput
Use of a motorized XY stage allows the analysis of time lapse changes in many points scattered over a wide area. The system is therefore effective for work with thick specimens, such as observing changes in the states and movements of stem cells using a brain slice, or analyzing expression mechanisms at the individual level in an embryo. In wide-ranging tasks such as analyzing cell functions using GFP, the system provides many different kinds of data at the same time, enabling a higher overall level of experiment efficiency even in long-lasting observations. In addition, using separate chambers at the same time makes it possible to perform different experiments at the same time. These are just some of the ways in which this system dramatically improves the throughput of experiments requiring long-duration observations.

Features
1. Measure up to 254 points
A variety of scan conditions can be set for each point, such as XYZ coordinates, the Z-axis acquisition range and the detector sensitivity.

2. Up to 5 X 5 adjacent fields of view registered automatically
Since adjacent fields of view are registered automatically, it is possible to broaden any given field while maintaining a high magnification level.

3. High-precision XY stage scanning
A wide area can be observed with highly precise position reproduction. Errors from repetition are not accumulated. (High-precision XY stage complies exclusively with the "PROSCAN" model from PRIOR Scientific)

4. Flexible scanning conditions
The system combines scan flexibility with time lapse imaging for monitoring changes in the specimen over time.

Introduction of DsRed2 expression vector into brain of 14th day mouse embryo through womb electroporation. Taking a specimen slice from the 15th day embryo and observing the living nerve stem cell and nerve cells subsequently born from it.

No1 No2 No3 No4 No5 No6

Using multi-point software*, it is possible to acquire an XYt, an XYZ or and XYZt image series at multiple positions through automated software control of the motorized XY stage.

* Multi-point software and motorized XY stage are optional
3D Imaging

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

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.

Acquire X-Y-Z images and display X-Y cross-sectional images quickly and continuously in increments of 0.01*µm
Thanks to the precision driving mechanism that enables 0.01µm step control within the BX61, BX61WI and IX81 motorized microscopes, high-quality continuous cross-sectional images can be acquired. The 3D function also provides extended focus projections, red/green stereo views, topographic projections and 3D animations for exploring the structure of the sample. Multi-plane images can be created from an XYZ image series, enabling easy measurement and observation of horizontal and vertical cross sections. Other useful procedures include 3D image cropping, series animation and simple volume measurement.

* 0.025µm is the smallest increment for other microscope combinations.

Topographic projection
Height of 3D structure indicated by color.
Colocalization

Analyzing the degree of intensity overlap between channels.

By using this function to analyze multi-color specimens, it is possible to discover whether different labeled substances are present in the same region. The ability to quantify the Pearson correlation, the overlapping coefficient and the colocalization index allows colocalization volumes to be compared between different specimens. Images can also be analyzed in series.

Threshold Mode
Threshold lines can be interactively altered.

Regions/Min-Max Mode
Setting the ROI (region of interest) on the histogram makes it possible to create a colocalization image. Values can also be obtained for Pearson correlation, overlapping coefficient and colocalization index.

Physiolink

Analyzing the state of a cell interior by synchronizing electrophysiological and confocal image data. (Optional software).

Link with patch clamping data
- With PCs linked through a LAN, Physiolink can synchronize electrophysiological and confocal image data simultaneously.
- With the same time stamp recorded in the two PCs, it is possible to access and analyze an image and its patch clamping data corresponding to the Physiolink software time scale.
- The patch clamping graph and Physiolink software are interlocked and activated concurrently.
- Physiolink software complies with the FV300’s high-speed scanning, enabling msec analysis.

Physiolink software (FV300 side)

Physioview software (Axon PC side)
Working conditions: Clampex Ver. 8.0 or later

Pacemaker neuron: Sea-slug (nudibranch)
Dr. Stuart Thompson, Department of Biological Sciences, Hopkins Marine Station, Stanford University.

Connecting two PCs by LAN is required.
Applications Gallery

Neuron

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

Mouse hippocampal neurons
GFP: postsynaptic density protein
Rhodamine-phalloidin: actin
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 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

Morphology

Mouse hippocampal neurons
Nucleus: DAPI (Blue)
Actin: FITC (Green)
Mitochondria: Mito Tracker (Red)
Microtubules: Cy5 (White)

Rat tongue taste bud
DAPI: Nuclei
FITC: Trk8, 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
**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.

**Expression of DsRed in a zebrafish embryo**
Extended focus image of 5µmx30 slice
Pr. Yasuhiro Kamei, Pr. Shunsuke Yuba
Institute for Molecular and Cellular Biology
Osaka University

**GFP-labeling of Drosophila adults**

**Plant**

**Coexpression of EGFP and DsRed in a zebrafish embryo**
Extended focus image of 10µmx28 slice
Pr. Yasuhiro Kamei, Pr. Shunsuke Yuba
Institute for Molecular and Cellular Biology
Osaka University

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

**Apoptosis of Tabacco hybrid plant cells**
Dr. Wataru Manubashi
Laboratory of Plant Breeding and Cell Engineering,
School of Agriculture, Ibaraki University
### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Laser light source</strong></td>
<td>Visible light laser source: Select from the following laser, to mounted on laser combiner: Multi-line 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), LD405 (405nm, 25mW), LD440 (440nm, 5.3mW)</td>
</tr>
<tr>
<td><strong>Laser combiner</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Scanning unit</strong></td>
<td><strong>Scanning method</strong>: Galvanometer mirror scanners (both X and Y)</td>
</tr>
<tr>
<td></td>
<td><strong>Field number</strong>: 20 (10 with use of LD405 laser)</td>
</tr>
<tr>
<td></td>
<td><strong>Pinhole</strong>: 5-position pinhole turret</td>
</tr>
<tr>
<td></td>
<td><strong>Image memory and scanning speed</strong>: Standard scanning mode: 256 x 256 (0.45s) - 2048 x 2048 (0.83s) Bi-directional high-speed scanning mode: 512 x 512 (0.25s) (Simultaneous scanning of up to 2 channels)</td>
</tr>
<tr>
<td></td>
<td><strong>Image channel</strong>: Selectable from 2-channel (fluorescence) or 2-channel (fluorescence) + 1-channel (transmitted light) 3-channel (fluorescence) using virtual channel</td>
</tr>
<tr>
<td></td>
<td><strong>Selection of filters according to staining</strong>: Manual selection</td>
</tr>
<tr>
<td></td>
<td><strong>Scanning modes</strong>: XY, XYZ, XYZ, XZ, XT, point, Line-t, free line-t, line-z, free line-z, Clp, Zoomln</td>
</tr>
<tr>
<td></td>
<td><strong>Image depth resolution</strong>: 12-bit (≈0.096 grey levels)</td>
</tr>
<tr>
<td></td>
<td><strong>Zoom</strong>: 1X-10X</td>
</tr>
<tr>
<td></td>
<td><strong>Z-drive</strong>: Step motor/Minimum step 10nm (BX61, BX61WI and IX81 combination), 25nm (other microscope combination)</td>
</tr>
<tr>
<td><strong>Microscopes</strong></td>
<td><strong>Upright</strong>: BX51, BX61, BX51WI, BX61WI</td>
</tr>
<tr>
<td></td>
<td><strong>Inverted (special laser safe frame)</strong>: IX81VFS, IX71VFSF (side port)</td>
</tr>
<tr>
<td><strong>External transmitted light unit</strong></td>
<td><strong>Transmitted light illumination unit</strong>: Connect to external mercury light source and microscope via fiber cable</td>
</tr>
<tr>
<td></td>
<td><strong>Transmitted light detector</strong>: External detector unit with built-in photomultiplier</td>
</tr>
<tr>
<td><strong>Fluorescence illumination unit</strong></td>
<td>Connect to external mercury light source and microscope via fiber cable</td>
</tr>
<tr>
<td><strong>PC with system control boards</strong></td>
<td><strong>Software</strong>: Hardware control: Laser, scanning unit, microscope</td>
</tr>
<tr>
<td></td>
<td><strong>Application software</strong>: Fluoview Image acquisition: Scanning condition setting: image size, scanning speed, zoom, panning etc. Real-time image calculation: Kalman filtering, peak integration,</td>
</tr>
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<td></td>
<td><strong>Hardware control</strong>: Laser, scanning unit, microscope</td>
</tr>
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<td></td>
<td><strong>Image display</strong>: 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</td>
</tr>
<tr>
<td></td>
<td><strong>Image processing</strong>: 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</td>
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<td><strong>Image analysis</strong>: Overview of fluorescence intensity within an area, histogram, perimeter measurement for user-assigned area, time-lapse measurement, etc.</td>
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<td><strong>3D visualization</strong>: 3D animation, left / right stereo pairs, red / green stereoscopic images and cross section</td>
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<tr>
<td><strong>Others</strong></td>
<td>Graphic-based help, PAPP (Programmable Acquisition Protocol Processor), time course software (optional), calculations: Inter-image, mathematical and logical, DIC: background leveling</td>
</tr>
</tbody>
</table>

### Objectives for BX and IX

#### (using U-UCD8, IX-LWUCDA and U-DICTS)

<table>
<thead>
<tr>
<th>Description</th>
<th>NA</th>
<th>W.D.</th>
<th>Cover glass thickness</th>
<th>Immersion</th>
<th>Correction ring</th>
<th>Condenser for U-UCD8 optical element</th>
<th>Condenser for IX-LWUCDA optical element</th>
<th>U-DICTS position</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPLSAPO 4X</td>
<td>0.16</td>
<td>0.13</td>
<td>—</td>
<td>—</td>
<td>U-DIC10</td>
<td>IX2-DIC10 normal</td>
<td>IX2-DIC10 normal</td>
<td>normal</td>
</tr>
<tr>
<td>UPLSAPO 10X</td>
<td>0.40</td>
<td>0.31</td>
<td>0.17</td>
<td>Oi</td>
<td>U-DP10</td>
<td>IX-DP10 normal</td>
<td>IX-DP10 normal</td>
<td>normal</td>
</tr>
<tr>
<td>UPLAPO 10XO3</td>
<td>0.40</td>
<td>0.24</td>
<td>0.17</td>
<td>Water</td>
<td>U-DP10</td>
<td>IX-DP10 normal</td>
<td>IX-DP10 normal</td>
<td>normal</td>
</tr>
<tr>
<td>UPLSAPO 20X</td>
<td>0.40</td>
<td>0.43</td>
<td>0.17</td>
<td>Water</td>
<td>U-DP10</td>
<td>IX-DP10 normal</td>
<td>IX-DP10 normal</td>
<td>normal</td>
</tr>
<tr>
<td>UPLSAPO 20X3</td>
<td>0.75</td>
<td>0.6</td>
<td>0.17</td>
<td>Oi</td>
<td>U-DP20</td>
<td>IX2-DIC20 normal</td>
<td>IX2-DIC20 normal</td>
<td>normal</td>
</tr>
<tr>
<td>UPLAPO 20XO3</td>
<td>0.80</td>
<td>0.19</td>
<td>—</td>
<td>Oi</td>
<td>U-DP20</td>
<td>IX2-DIC20 normal</td>
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<tr>
<td>UPLAPO 4X20</td>
<td>0.90</td>
<td>0.2</td>
<td>0.11-0.23</td>
<td>Oi</td>
<td>U-DIC40</td>
<td>IX2-DIC40 normal</td>
<td>IX2-DIC40 normal</td>
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<tr>
<td>UFLEFL 400X</td>
<td>1.30</td>
<td>0.24</td>
<td>0.17</td>
<td>Oi</td>
<td>U-DIC40</td>
<td>IX2-DIC40 normal</td>
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<tr>
<td>PLAPLO 60XO</td>
<td>1.42</td>
<td>0.15</td>
<td>0.17</td>
<td>Oi</td>
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<td>IX2-DIC60 normal</td>
<td>BFP1</td>
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<td>UPLSAPO 60OX</td>
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<td>0.15</td>
<td>0.17</td>
<td>Oi</td>
<td>U-DIC60</td>
<td>IX2-DIC60 normal</td>
<td>IX2-DIC60 normal</td>
<td>BFP1</td>
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<td>0.28</td>
<td>0.15-0.2</td>
<td>Water</td>
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<tr>
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<td>U-DIC100</td>
<td>X2-DIC100 normal</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description</th>
<th>NA</th>
<th>W.D.</th>
<th>DIC ring</th>
<th>Reviving nosepiece</th>
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<tr>
<td>MPL5X</td>
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<td>19.60</td>
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<td>WI-SSMP, WI-SRE2</td>
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<tr>
<td>UMLPLFL100W</td>
<td>0.30</td>
<td>3.30</td>
<td>U-LDP90H</td>
<td>WI-SSMP, WI-SRE2</td>
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<tr>
<td>UMLPLFL200X</td>
<td>0.50</td>
<td>3.30</td>
<td>U-LDP90H</td>
<td>WI-SSMP, WI-SRE2</td>
</tr>
<tr>
<td>UMLPLFL400X</td>
<td>0.80</td>
<td>3.30</td>
<td>U-LDP90H</td>
<td>WI-SSMP, WI-SRE2</td>
</tr>
<tr>
<td>UMLPLFL600X</td>
<td>0.90</td>
<td>2.00</td>
<td>U-LDP60H</td>
<td>WI-SSMP, WI-SRE2</td>
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<tr>
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<td>3.30</td>
<td>U-LDP90H</td>
<td>WI-SSMP, WI-SRE2</td>
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<tr>
<td>UMLPLFL600X/W2</td>
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<td>2.00</td>
<td>U-LDP60H</td>
<td>WI-SSMP, WI-SRE2</td>
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<tr>
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<tr>
<td>XULMLPLFL200X</td>
<td>0.95</td>
<td>2.00</td>
<td>U-LDP100</td>
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</table>

*Note: These conditions are not met in confocal microscopy*
Different types of laser combiners

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

* Laser combiner for AOTF is required for multi-line Argon laser.

Laser combiner with Ar+HeNe (Red) / (Green) lasers
Laser combiner with Multi Ar+HeNe (Red) / (Green) lasers
* Installation stand is not included in the unit.

* Please consult your Olympus dealer for additional laser combinations.

External transmitted light detector system

Fluorescence illumination system

• Standard configuration for FV300-BX51/FV300-BX61/FV300-BX51WI/FV300-BX61WI combination.