DynaMyc

Fluorescence Lifetime Mapping Microscope
**Time-resolved fluorescence on the micron-scale**

The DynaMyc is the ultimate tool to investigate dynamic events in microscopic samples, such as energy transfer and molecular binding. HORIBA Scientific, leader in fluorescence spectroscopy, offers an advanced system to apply time-resolved fluorescence spectroscopy on the micron-scale.

The DynaMyc is an automated, confocal microscope featuring the precision and sensitivity of Time-Correlated Single-Photon Counting (TCSPC). Its FLIM capabilities include an automated X,Y,Z fast scanning stage, which, combined with its confocal ability, can generate fluorescence lifetime mapping with a spatial resolution at micron level.

The DynaMyc is a flexible research grade tool that combines a large range of picosecond pulsed laser diode sources (spanning wavelengths from 375 to 670 nm and repetition rates from CW to 20 MHz), multiple filter configurations and various detector options to suit your needs. Its imaging capabilities include a CCD camera for the definition of the area of interest, with direct fluorescence imaging possible using an optional high dynamic range low noise cooled camera. The DynaMyc is fully-automated and controlled from the intuitive user interface of our DataStation software. Full reconvolution analysis can be performed to generate maps of the fit parameters such as lifetimes, relative amplitudes, average lifetime, and fluorescence intensity.

**Applications:**

- Biological as well as material science samples
- Cell and tissue analysis
- Auto-fluorescence (proteins, DNAs & antibodies)
- Conjugated fluorescence labels & quantum dots
- Thin films and semiconductors
- Fluorescence dyes
- Nanoparticles
- Quantum dots
- FRET

*Example: Lifetime imaging on Lilly pollen grain*
**Unique features:**

- Fully-automated system with fiber coupling, confocal head unit and single-photon counting module
- Lifetime determination from 100 ps to 10 µs, 7ps resolution
- New PicoBrite™ high repetition rate lasers, CW or pulsed operation
- Intuitive data acquisition and analysis software
- Optional cooled fluorescence camera

**Components:**

**Picobrite sources**
Repetition rate up to 20 MHz

- 375 nm
- 405 nm
- 440 nm
- 470 nm
- 488 nm
- 635 nm
- 650 nm
- 670 nm

**X-Y-Z motorized stage**
Automated X-Y-Z stage
0.5 µm resolution

**TBX series PMT**
Spectral response 185nm-650nm
Dark counts < 20cps typical, 80cps maximum

**FluoroHub**
Time-correlated single photon module
Resolution 7ps/channel as standard

**Example:** Lifetime and fluorescence intensity imaging on 5 euro bill

**DataStation software**
## Technical specifications

| **Microscope** | Based on upright Olympus BX51 microscope |
| **Objectives** | Plan achromat x10 and x50, other magnifications available. 5 position turret. |
| **Confocal pinhole** | 4 diameters, from 100µm to 1000 µm, Motorized, computer-controlled |

| **Camera** |  |
| **Color USB CCD** | 2 Mpix, 8 bits |
| **Fluorescence camera** | 1.4 Mpix cooled, optional |

| **Excitation sources** | Fiber-coupled pulsed laser sources |
| **Repetition rate** | 10 kHz to 20 MHz, with PicoBrite sources |
| **Wavelength range** | 10 kHz to 1 MHz, with NanoLED sources |
| **Excitation sources** | From 375 to 670nm. Refer to table on p3. |

| **Motorized stage** |  |
| **Resolution** | 0.5 µm |
| **Travel range** | 75 x 50 mm |
| **Manual control** | With joystick |
| **Automatic control** | Through DataStation software |

| **TCSPC electronics** | Single-photon counting detection |
| **Resolution** | 7ps/channel as standard |
| **Lifetime range** | 100 ps to 10 µs, depending on sample |

| **Detector** | TBX fast PMT |
| **Spectral range** | 185-650nm / 300-850nm |
| **Transit spread time** | 200 ps |
| **Dark count** | < 80cps |

| **Filters** |  |
| **Excitation filters** | 10nm BP filters |
| **Fluorescence filters** | 2 positions |
| **Emission filters** | Motorized, computer-controlled |
| **Emission filters** | 2 positions: 40nm BP filters |
| **ND filters** | Motorized, computer-controlled |
| **ND filters** | 6 positions: 0, 0.3, 0.6, 1, 2 and 3 OD |
| **ND filters** | Motorized, computer-controlled |

| **Software** |  |
| **Data acquisition** | DataStation software |
| **Data analysis** | DAS6 software, inc. optional reconvolution |
| **Operating system** | Windows XP / Windows Vista |

| **Dimensions** | 140 cm x 90 cm x 80 cm |