WIDEFIELD FLUORESCENCE MICROSCOPE WORKSTATION - SPECIFICATIONS

IISER Mohali seeks to procure a **Computer-controlled Widefield Fluorescence Microscope Workstation for live cell imaging experiments** with the following features and technical specifications. Since this is a workstation involving different components, manufacturers quoting for combinations of self-manufactured and third-party-sourced items such as camera/light source will be expected to integrate all hardware/software items for instrument control/data acquisition/analyses before supply of the workstation, and demonstrate all features in compliance with specifications during installation, bearing full responsibility for the entire workstation. Also, a compliance statement must be accompanied by annotated brochure pages (or certificates from the manufacturer) demonstrating compliance with stated specifications.

1. Anti-vibration platform
2. Full microscope incubator for live cell imaging, with digital control of CO2, temperature and humidity, and arrangements (e.g., window) for accessing sample/stage during experiments
3. 'Factory-integrated' EM-CCD camera with 90 percent quantum efficiency, 512 x 512 pixels, 60 frames per second acquisition (or better)
4. Solid-state illumination with lifetime of 10000 hours (or better) and software control for automated wavelength switching, beam combiner for all modules, optimized shift-free filter set, and illumination wavelengths falling in each of the following six specified broad wavelength ranges, for exciting all fluors specifically mentioned in parentheses: 381-399 (DAPI), 426-450 (CFP), 461-489 (GFP/FITC), 505-515 (YFP), 529-588 (Cy3, MRFP, m-Cherry), 621-643 (Cy5).
5. Software and hardware capable of performing multichannel fluorescence, DIC-fluorescence, time lapse images at > 10 frames per second, 2D imaging, 3D imaging, z-stack, 6D Imaging (x, y, z, t, lamda, and large image), volume rendering and measurement for converting z-stacks to 3D (x,y,z) or 4D (x,y,z,t) data, 3D real time deconvolution for image processing, multi-point imaging, tile imaging, mosaic imaging, intensity plots of regions of interest during imaging
6. High speed computer (Xeon 6 or better) for all instrument control, data acquisition and analyses, with Windows 7 operating system, 12/16 GB RAM, 16x PCI slot and RAID configuration for HDDs, Disk space of 4 TB of higher for storage of data, high speed trigger boards to synchronize with various hardware components, firewire card, 2 X (27 inch TFT monitor screen)
7. Suitable online UPS to support the complete system with minimum 30 minutes
   back-up time

8. Microscope body, stand, stage and stage-control, objectives, eyepiece, automation, motorization, condensers, filters, analyser, polarizer, turret and triggering arrangements compliant with the following detailed specifications :
    a. suitable arrangements for Bright Field, DIC & Fluorescence illumination.
    b. motorized built in z-focusing drive with a minimum settable step size of 15 nm or less
    c. sextuple DIC objective nosepiece
    d. motorized fluorescence reflector turret with automatic filter
    e. 5 (or more) positions condenser for prisms for brightfield or DIC
    f. optimized/corrected fluorescence light path
    g. motorized/electronically-controlled shutters
    h. arrangements for homogenous and uniform illumination
    i. dedicated touchscreen/key-panel/joystick arrangements to control all motorized components
    j. LED/halogen illumination for transmitted light
    k. motorized X-Y scanning stage with travel range suitable for working with cover slips (25 x 25 mm or better) and resolution of 100 nm (or better)
    l. complete integration of stage movement with software for multipoint, tile, and mosaic imaging
    m. Siedentopf observation tube for 22 or 23 mm field of view
    n. Paired widefield 10 X eyepieces with 22 or 23 mm field of view
    o. IR laser-based or LED-based drift compensation in z with software control of all parameters
    p. The following objective lenses, with correction rings wherever necessary, and complete DIC accessories for 20 X, 40 X, 60 X/63 X, and 100 X objectives : (i) 10 X super apochromat with 0.4 NA (or better); (ii) 20X super apochromat with 0.75 NA (or better); (iii) 40 X Semi Apochromat with 1.3 NA (or better), (iv) 40 X oil-immersion Plan Apochromat with 1.4 NA (or better); (v) 60 X / 63 X oil-immersion Plan Apochromat with 1.4 NA (or better), (vi) 100 X oil-immersion Plan Apochromat with 1.4 NA (or better)
    q. arrangements for Analyzer to come into the light path automatically when DIC mode is selected through keypad/touchscreen/software.
    r. High efficiency bandpass filters suitable for CFP, MRFP, mCherry, GFP/YFP, FITC, DAPI, Cy3, TxRed, Cy5, with arrangements for automatic switching between wavelengths
    s. TTL signals (or equivalent) Trigger Board-based technology with arrangements for synchronizing image acquisition, hardware, and raw data streaming directly to hard disk.
9. Warranty documents should be provided separately for all third-party-sourced items at the time of supply, along with manufacturer’s warranty documents. Authorization letters from third parties should also be provided, wherever applicable.