

# **Tender Notification for the procurement of a “Epifluorescence and Scanning Confocal Microscope at the Indian Institute of Science, Bangalore”**

Ref: MCB/SK/69/2016-17

December 9, 2016

**(Last Date for submission of tender: 23 December, 2016)**

Dear Sir/Madam,

Kindly send your best price quotation for the following items with specifications under mentioned as CIF Bangalore basis to the undersigned. Your quotation should clearly indicate the terms and conditions of the quotations, delivery, delivery schedule, entry tax, payment terms, warranty coverage etc. The tender should be submitted in two separate sealed envelopes – one containing the technical bid and other containing the commercial bid, from reputed Manufactures, both of which should reach the undersigned, duly signed on or before **23 December 2016**.

Please enclose a compliance certificate along with technical bid.

## **Detailed Specifications of Epifluorescence system:**

### **Fully Motorized Inverted Fluorescence Research Microscope:**

- a) Fully Motorized Inverted Fluorescence Microscope for BF/DIC/Fluorescence with touch-pad and remote control for controlling motorized components of the microscope.
- b) Tilttable binocular eyepiece
- c) Motorized XY-scanning stage with tile-scan capability and Multi well imaging capability with linear encoder for good accuracy, high XY stability and repeatability. Control by Joystic and touch pad (LCD-based). Fine and coarse control of speed. Holders for slides, 35/60 mm Petri dish, and 96-well dishes with multipoint, tile and mosaic imaging software (capable of fast 6D imaging). XY-motorized stage should accommodate stage top CO2 incubator.
- d) Built in fast motorised Z motor with a minimum step size of 10nm or better.

e) Motorised Continuous Automatic Drift Correction in IR (LED or LASER >750 nm) based Z-drift compensator by sensing the position of the coverslip for fine focusing during long-duration live-imaging controlled by touch screen panel. It would be a plus if such z-drift compensator also works for plastic bottom dishes, including 96-well plates.

f) Motorized filter turret with a minimum of 6 positions for accommodating fluorescent filters for sample visualization and camera based imaging. Narrow band pass filters cubes for UV, Blue (EGFP), Green, YFP, mCherry and siR (Alexa 647) excitation. Motorized control of epifluorescence filter turret. Motorized shutter in the fluorescence illumination light path (either on the turret or built-in in the light source). An additional deck/infinity space for future upgradation is preferable.

g) Stable 130 W Mercury Vapor Short Arc or a Metal Halide lamp having panel control: Power On/Off, reset accumulated lamp hours, with various intensity setting for example 100 %, 50 %, 25 %, 12 %, 6 %, 3 % 0 %. Panel Displays: Accumulated lamp hours.

h) 10X (semi Apochromatic), 20X (NA 0.45 or better) (semi Apochromatic capable of capturing phase contrast images), 40X NA (NA 1.3 or better) capable of conducting DIC, Apochromatic 60/63X (NA 1.4 or higher) DIC compatible, Apochromatic 100X (NA 1.4 or higher) DIC compatible. Automated shift free DIC accessories for all objectives.

i) 12V 100 W Halogen Lamp or LED-based transmitted light illumination for BF, DIC and phase contrast imaging.

j) Motorized condenser with motorised polariser and motorised shutter unit with 6 or more position, should be controlled by touch panel screen as well as with the software.

k) DIC prisms for 10X, 40X, 60/63X, and 100X objectives and phase ring for 20X objective

l) Microscope-based software to control all the feature of a camera, along with optional camera (please see specifications below)

m) Setup for long term live cell imaging including Incubation system with Temperature, CO<sub>2</sub>, humidity control. High performance heating, humidity and CO<sub>2</sub> control stage top incubator with built-in digital gas mixer for 100% CO<sub>2</sub> gas cylinder use must be provided. It should come with multiple attachments such as 96-well Plate, 35mm, 50mm, 60mm petri-dish, Chamber slide, Chambered cover-glass. Touch panel controller.

Setting Mode : Touch Panel, Humidity : Internal Humidifier more than 90%, CO<sub>2</sub> Control - CO<sub>2</sub> regulation : Digital, CO<sub>2</sub> setting range : 5.0~20% , CO<sub>2</sub> Accuracy : ±0.1% (at 5%), Gas flow rate : 160ml/min, Stage heater Regulation and Hi-speed ON/OFF.

Preference will be given to a hi-end new model of such incubators and CO<sub>2</sub>. Please attach the pamphlet including a complete description of the system.

n) At least 3 spares oil bottles of immersion

### **Optional Item**

#### **Cooled monochrome CCD camera**

Cooled monochrome CCD camera optimised for high sensitivity, 1.4 million net effective pixel resolution controlled by the same confocal software, capable of multichannel imaging, z stack, time lapse wide field imaging with fluorescence/DIC/phase contrast alone or in combination. High frame rate, Peltier cooling -10 degree@ 25 degree ambient or more, 2/3 inch CCD. Pixel size 6.45  $\mu$ m x 6.45  $\mu$ m, C mount type.

### **Confocal Imaging Unit**

#### **Point scanning confocal microscope with spectrally resolved detection feature**

##### **Detailed specifications of Confocal system:**

##### **1. Confocal imaging unit with high sensitivity detectors.**

a) Laser point scanning confocal system with the ability to conduct spectrally-resolved detection. User must have freedom to select the exact wavelength range, they wish to capture in every detection channel at nano-meter precision (2nm or better throughout the spectral range of for all the spectral detectors).

b) 2-channel multi-Alkali PMT detectors with spectral detection capability. At least 2 independent fluorescence signal implemented using 2-independent multi-Alkali PMT detectors with independent PMT gain and independent PMT offset controls for each detector. Simultaneous detection of minimum 2 fluorophores is a must. System should be capable of doing 4 colours in sequential mode. Compatible to upgradation for two or more high sensitivity spectral peltier cooled GaAsP detector (2nm or better). The detectors should directly be coupled to scan head (without any optical fibre) for better signal and sensitivity.

c) Spectral operation should be performed either using one or more of the following methods: i.) Reflection Diffraction Grating ii.) Pellin-Broca Prism iii.) Holographic Transmission Diffraction Grating.

d) Spectral pass-band selection using slit/knife edge based mechanism with continuously variable slits in all the detectors down to 2nm. Robust spectral resolution detection:

e) Transmitted detector unit with motorized switching to conduct DIC and Phase contrast with confocal imaging.

f) The system should have galvo-mirror with highest reflectivity from 400-1000nm (>90%) for better sensitivity from UV–near-IR Imaging.

## 2. Scanning

a) Fast scanning with at least 5 fps at 512X512, Optical zoom-1X-50X, Scan rotation 360 degree, and various scanning mode including region of interest (ROI) scanning mode. Optical zoom-1X-50X.

b) Scanning resolution: 64X64 to 4096X4096.

## 3. Laser modules with AOTF control

a) Solid-State Laser module for 405nm, 488nm, 561 nm and 640 nm, which should be upgradable to maximum 3 more lasers for future applications. Laser-scan head connection through fiber optic cable. Laser must switch fast synchronised manner for conducting photoactivation, photo-conversion and FRAP experiments at the particular ROI through AOTF.

b) All lasers should be diode or solid state with output power larger than or equals to 20mW.

c) All visible & UV lasers should be combined and connected to scanner through single optical fibre. Real ROI scan for FRAP, Photo-activation and photo-conversion experiments.

d) The scan head and the detector should be directly connected microscope and not through optical fibre to avoid signal loss.

## 4. System control and Imaging Software (must be provided with life time license agreement)

a) Software should be capable of controlling every component of the system including microscope, Confocal system.

b) Multidimensional Image Acquisition and analysis software.

c) Motorised stage control for multipoint, multi-well (in the case of 96-well plate).

d) Image stitching software module.

e) 2D Deconvolution.

f) Real ROI for FRAP, Photo-activation and Photo-conversion experiments.

f) Advance 3D-image reconstruction with rendering from a Z-stack image series.

- g) Standard geometry measurement such as length, angles, areas and intensity measurements like line profile, histogram and intensity statistics.
- f) FRET and FRAP acquisition and analysis module.
- g) Co-localization analysis.
- h) orthogonal plane viewing of the 3D time-lapse data set.
- i) User should be able to perform offline analysis of the data.
- j) Spectral un-mixing with the fingerprinting for separation of overlapping excitation/emission spectra of fluorophores (online and offline).
- k) Capability to perform Macro to micro imaging of large specimens with seamless stitching capability in real-time.

#### 5. Computer and Monitor

- a) High end CPU with fast processor (Intel Xeon 3.5 GHz or better)
- b) At least 1TB of storage space
- c) At least 8 GB RAM
- d) High performance graphic card with at least 2 GB VRAM
- e) 64-bit operating system
- f) Slim SuperMulti DVDRW
- g) 1TB 7200 RPM SATA 1st HDD , 1TB 7200 RPM SATA 2nd HDD
- h) USB Keyboard, USB 1000dpi laser mouse
- i) Win 7 Ultimate 64 bit or better, USB 2.0/ 3.0, Fire wire. Large 30" LED monitor.

#### 6. Service Support

- a) 2 years warranty including for all the lasers and 2 years Annual Maintenance Contract (AMC) post warranty .

The above mentioned technical specifications are highly desirable. However, lower technical specifications may be considered if the above mentioned specifications are found to be unsuitable in financial terms. The Institute reserves the right to go for lower specifications taking into considerations its financial constraints and technical preferences.

**Terms and conditions:**

The above mentioned technical specifications are highly desired.

The vendor should have a good track record of having previously supplied confocal systems at least five in Bangalore (please furnish the details).

The system should come with 2 years warranty including for all the lasers and 2 additional years of AMC as mentioned above.

The vendor should have qualified technical service support personnel in Bangalore with 24X7 assistance.

The payment will be through confirmed irrevocable Letter of Credit.

The lead time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.

The validity period of the quotation should be 90 days.

Yours Sincerely,

Dr. Sachin Kotak, Department of Microbiology and Cell Biology (MCB), IISc.

(on behalf of the purchase committee)