



# Indian Institute of Technology, Kanpur

Department of Chemical Engineering

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February 01, 2012

## Quotation Request Notice

Sealed quotations are invited from dealers/distributors by 'Confocal Laser scanning Microscope' of at least following specifications. The quote should be submitted to the Department of Chemical Engineering, IIT Kanpur by 09.02.2012.

Enquiry No: Nanoscience/CHE/SS

Opening date: 01.02.2012

Closing date: 09.02.2012

The Following Specifications are as under:

### **SPECTRAL CONFOCAL LASER SCANNING MICROSCOPE SYSTEM WITH LIVE CELL ACCESSORIES.**

The spectral confocal microscope system should be of latest technology and should be capable of meeting various challenging biological experiments with live cell imaging capability. System should be of high sensitive detection for Live Cell imaging applications for FRAP, FRET, photo activation and photo-conversion experiments. The system should be upgradable to FCS, Multiphoton and FLIM etc.

The system configuration should include:

#### **A. Fully Motorized & Computer Controlled Inverted Fluorescence Research Microscope:**

1. Optics for Bright field, Fluorescence and DIC observations.
2. Motorized Z-focus drive with minimum step resolution of 10 nm or better.
3. Dedicated TFT/LCD touch screen capable of controlling all motorized functions of microscope.
4. 6 position motorized FL filter wheel, 6 position motorized DIC nose piece.
5. Mechanical stage with universal sample holder for slides as well as Petri dish.
6. 100W halogen illumination for BF & DIC and Hg illumination for FL.

7. High resolution Confocal grade objectives 10x/0.30, 20x/0.80 or higher, 40x/1.3 or higher (oil), & 60/63x/1.40 oil immersion with complete DIC accessories for all objectives.
8. Band pass Fluorescent filters for DAPI, FITC/GFP& TRITC/Rhodamine.
9. An imported (Newport or equivalent) anti-vibration table with air damping, bread board table top with M-6 threading.
10. **Laser Based Focus Drift compensation** for long term time lapse imaging should be included.
11. **Programmable and software controlled fully automatic on stage incubation system** with temperature, humidity and CO<sub>2</sub> control, capable of operating with 100% CO<sub>2</sub> gas supply should be offered. The incubation system should be controlled for same confocal software for optimal performance and compatibility.

#### **B. Spectral Confocal Laser Scan head with built-in detectors:**

1. Confocal laser point scanning and detection unit with built-in spectral detectors for high efficient and sensitive detection of emission fluorescence signal.
2. The detection unit should have **dual detection capability with intensity based Confocal Imaging as well as Spectral (lambda stack) confocal Imaging.**
3. Scan head should have built-in 3 or more spectral detection PMT's for online spectral detection and separation. **Detection system with capability of higher number of simultaneous fluorophore imaging will be preferred.**
4. All detectors should have computerized freely selectable spectral emission bandwidth for optimal detection of signals. The spectral dispersion of the emission light should be of latest technology with high efficient reflection grating or with prism dispersion. The scanner unit should be included with sensitivity improving components like spectral recycling /low angle incidence dichroic / crystal based dichroic.
5. System should be capable of **ONLINE separation and display of over-lapping emission signals through emission finger printing technique.**
6. Motorized & computer controlled continuously variable confocal pinhole with software control.
7. High speed XY galvo scanner with min.200 deg scan rotation with scan flexibilities for Line, free hand curved line, XY, XYZ, XYZ t and XYZ t λ combinations.
8. The laser scanner should have capability of real ROI fast scan bleaching/photo-activation including scan for Imaging for FRAP, FRET & photo conversion experiments.
9. Scan resolution should be **6K x 6K or better** and can be selected freely down to **16x16 pixels.**
10. Scan Zoom range 1.0 x to 40 x or more and should be adjustable in steps of 0.1.
11. Scan frame rate should be at least **8-10 fps or higher @ 512x512.**
12. The **scanner should have high speed imaging capability with frame rate of at least 200 fps @ 512x16 or higher for dynamic imaging experiments such as Ca<sup>2+</sup> flow.**
13. Scan field diagonal should be 20 mm or better.
14. An additional transmitted light PMT detector for bright field / DIC imaging.

#### **C. Laser module with AOTF control:**

1. Air cooled multi-line Ar laser with 458/488/514nm.
2. Air Cooled He Ne 543nm laser.

3. Air cooled He Ne laser with 633nm.
4. Blue Diode laser 405/408nm to be offered optionally.

All the lasers should be connected to the scan head through fiber optic cable and should be computer controlled through **8-channel AOTF** for fast laser switching and attenuation.

#### **D. Control computer and Monitor:**

1. Latest control computer with dual Processor: Core 2 Duo E8400, memory: 4GB DDR2-800, hard disc: 2x HDD SATA II 500GB 7.2k, DVD SuperMulti SATA, ATI Fire GL V5600 512MB, Gigabit Ethernet, Vista Ultimate MuLi, USB 2.0, Firewire.
2. A high resolution large TFT screen with 30" diagonal, 2560x1600 pixel resolution.

#### **E. System control and Confocal Imaging Software:**

Software should be capable of controlling Motorized components of microscope, digital camera, scan head control, laser control including AOTF and Image acquisition & processing.

1. Saving of all system parameters with the image for repeatable/reproducible imaging.
2. Line, curved line, frame, Z-stack, Time series imaging capabilities.
3. **Real ROI bleach functionality** for FRAP, Photo-activation/conversion experiments.
4. FRET imaging as well as Quantitative data analysis capability.
5. Standard geometry Measurements like length, areas, angles etc including intensity measurements.
6. **3D image reconstruction** with rendering from a Z-stack image series.
7. Co-localization and histogram analysis with individual parameters.
8. Spectral un-mixing with emission fingerprinting technique for separation of overlapping emission spectra.( bleed through)

#### **F. Optional accessories for the confocal system**

1. Pulsed/CW blue diode laser 405/408 nm (25mW or better) for imaging as well as FLIM applications
2. Multi array detector for simultaneous acquisition of six or higher flourophores.
3. Vis- FLIM system based on TCSPC including PMT/hybrid detectors, correlator cards and dedicated software with laptop.

The bidders should provide full details of after sales service supports, detailed list of users with contact details. Also the system should be supplied with an online UPS system for the complete system for trouble free operation. Please mention the warranty and terms/conditions for the complete supply.

#### Terms & Conditions of the quotations are as under:

1. The quotations should be submitted in the properly sealed envelope, addressed to the undersigned. The enquiry no. and date should invariably be quoted on the top of the envelope.

2. The time allowed for carrying out the above note work is 15(fifteen days) days.
3. The rate quoted should be inclusive of sales tax and other taxes including freight charges (if any).
4. The quotations shall remain valid for two months from the date of opening.
5. The material should be used as per enclosed approved list of make.
6. The Institute reserves the right of accepting or rejecting any quotations without assigning any reason thereof.

Kindly send your quotation before respected date in the following address:

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