

Chapter 8: Specification and Allied Technical Details (Item No. 4)	
Revised Technical Specification after Pre-Bid Meeting January 2017	
Name of the Item: Confocal Laser Scanning Microscopy	
Sl. No.	Revised Specification (After Pre-bid Meeting)
1	Inverted Microscope (Fully Motorized)
1a	Bright field, Fluorescence and differential interface contrast (DIC) illumination with facility for confocal scan head attachment
1b	Automatic (motorized) beam path selection for visual and confocal imaging
1c	Motorized Z focus facility i.e., highest resolution drive with minimum stable resolution of 30 nm or better
1d	Online display screen on microscope body for the motorised functions or on microscope controlling unit
1e	Minimum 6 position or higher motorized fluorescent light (FL) filter wheel, with minimum 6 position motorized DIC nosepiece
1f	Motorised XY scanning stage for the movement of specimen using suitable joy-stick with in built software to control the joy-stick
1g	Minimum 12v/100w halogen / LED illumination for transmitted light
1h	High resolution Plan Apo (confocal grade) objectives of 4x,10x, 20x, 40x, 60x/63xoil (N.A 1.4 or better) and 60x/63x water (NA 1.20 or better) & 100x oil immersion (N.A 1.4 or better)
1i	Minimum 120w/130w metal halide or mercury lamp with a minimum of 1 year of lamp life for fluorescence observation with automatic shutter having DC (direct current) to provide constant and non-fluctuating light
1j	Dedicated attachment for converting inverted microscope to upright microscope for deep imaging applications in the sample such as biofilms and porous material
1k	The equipment should accompany with the facility to install in suitable long term platform
2	Scanhead and detection system of Confocal
2a	Scan head with dual imaging capability with conventional fluorescence imaging (filter/prism based) and real time confocal imaging.

2b	Detectors should be capable of working in Intensity and Spectral mode Imaging. Should be capable of simultaneous detection and separation of minimum 5 fluorophores . The detection unit should be a combination of 2 PMT & 3 GaAsP/HyD . The high sensitive detectors should have QE approx. 45% or better
2c	Computer controlled continuously variable single pinhole system, which should cover wider area for higher brightness and without affecting sectioning performance.
2d	The scanner should have "ROI" scan capability for fast scan. Maximum scan resolution should be at least 6Kx6K or better per channel and should reduce to 16X16 resolution or better .
2e	The scan head should be able to perform fast dynamic live cell time lapse imaging with ROI capability with a high speed of 100-300 fps or better @512X32 resolution OR scan speed should be 7-10fps or better @512X512 resolution
2f	The scan field diagonal should be atleast 20 mm or better. Scan Zoom range from 1X to 40X or better with increments of 0.1X.
2g	System should possess efficient dichroic mirror with low angle incidence for higher transmission efficiency.
2h	Maximum scan resolution of up to 4Kx4K or better with a scan field of 18mm or higher
2i	Scan zoom of 1-40X or more continuous variable. Multi step scanning zoom preferred
2j	It should be capable of conducting long time live cell imaging applications without focus drift through hardware LED (more than 850nm) based continuous focus correction System.
2k	Onstage CO2 incubator for live cell imaging, which can hold petriplate & multiwall plate etc. The Incubation parameters such as Temperature, CO2, Humidity to be controlled, so that incubation gets synchronized with the system as well as with the experiment.
2l	Transmitted light detector to be provided for capturing bright field and DIC images
3	<p>Lasers: Pre aligned Solid State/ Gas State laser module with laser lines of</p> <p>a) Multi-line Ar laser with 458/488/514nm.</p> <p>b) DPSS 561 nm</p> <p>c) HeNe 633 nm</p> <p>d) Blue Diode Laser 405/408nm.</p> <p>All visible lasers should be connected to the scan head through fiber optic cable and should be controlled through AOTF for fast laser switching and attenuation in pixel precise synchronization with the laser scanner for ROI scan for FRAP, Photo activation/conversion experiments. All the laser lines should be controlled through a computerized AOTF device for fast laser switching and attenuation.</p>

4	<u>Hardware Based high Resolution Imaging Attachment:</u>
4a	Fully automated and motorized High Resolution attachment with suitable high sensitive Detectors for complete Vis Spectrum.
4b	The system should be able to work in High resolution as well as Confocal Mode for normal imaging.
4c	Should be able to achieve Lateral resolution of atleast 120-150 nm and Axial resolution of approximately 300-400nm.
4d	Detection should be based on GaAsP/HyD or high sensitive detectors
4e	Any sample used for Confocal system should be used for imaging in High resolution mode without changing sample preparation techniques/protocol.
4f	Live cell imaging should be a must in high resolution mode. All laser lines for Confocal Imaging should be used for imaging in high resolution mode.
4g	Microscope should be equipped with either peizo stage or bidirectional galvo stage for fastest possible Z sections, with travel range of at least 100 microns or better for fast imaging in Confocal and SR mode.
5	<u>Computer Workstation (To be supplied from principal company) with the following specifications or similar/ better:</u> Latest 64 bit control computer with Intel Xeon 6 Core Processor DDR RAM 48 GB HDD: 4 TB SATA upgradable to 8 TB or better, DVD, SuperMulti SATA +R/RW Graphics: AT Fire GL V5200 256MB DH DVI, Gigabit Ethernet, Win 7 Ultimate 64 bit, USB 2.0, Fire wire. Large 32" or better LCD TFT monitor.
6	<u>Controlling and Analysis Software</u>
6a	Basic image acquisition, Complete microscope control, Scan head control and Laser control software. Same software should be capable to control Super-Resolution microscope.
6b	Saving of all instrument parameters along with the image for repeatable/reproducible imaging

6c	Frame/line/lambda capturing, Z-Stack, Time series imaging capabilities
6d	ROI bleach for FRAP experiments
6e	FRET Imaging, Multipoint Time Lapse Imaging.
6f	Co-localization analysis and volume rendering
6g	Real time ratio-display
6h	2 D and 3D image deconvolution
6i	Diverse measurement and statistical processing
6j	Software should be capable to record Live graphs of different Live cell imaging experiments as a recorded data.
6k	System should be capable to enhance the resolution above diffraction limit using hardware OR software to improve confocal resolution appr. 160nm in XY and minimum of 350-400nm in Z.
7	General
7a	On-site Comprehensive Warranty for the Equipment for 5 (five) years after successful installation and commissioning.
7b	Suitable Online UPS (inductive load) with built-in isolation transformer with minimum 2 (two) hours back-up time under full load for complete system will be required.
7c	All necessary components / accessories required for installation and smooth running of the equipment to be quoted.
7d	The company should clearly specify the pre-installation requirements.
7e	Detailed list of users in India and especially in North East region wit contact details should be given.
7f	Training on operation and maintenance of the machine are to be imparted by the firm during installation and commissioning.
7g	g) Bidder should ensure availability of spares for at least 10 (ten) years.
7h	Annual Maintenance Contract (AMC) for 5 (five) years with 2 (two) preventive and 1 (one) break down visit minimum. The rates will be obtained but not included in the total cost for price comparison.
7i	Insurance coverage and liaising with insurance company for any matter will be the responsibility of the supplier up to the installation of the instrument
	NOTE: All other terms and conditions of tender document except the above Chapter 8, Item No. 4 will remain same. All prospective bidders may quote accordingly.