BOSE INSTITUTE
KOLKATA

AMENDED SPECIFICATIONS (HIGHLIGHTED PORTION) AS FINALIZED BY THE COMPETENT AUTHORITY

SPECIFICATIONS FOR SPECTRAL LASER SCANNING CONFOCAL MICROSCOPE FOR BIOLOGICAL SCIENCES APPLICATIONS

The high sensitivity detection system should have the capability of meeting various imaging needs of the biological scientists of this institute, including live cell imaging for FRAP and FRET experiments.

The configurations of the system should be as follows:

Fully-motorized inverted research microscope:

Fully motorized inverted microscope with motorized switching between LSM light path and fluorescence illumination. Must be compatible for bright field, fluorescence and DIC observations.
Suitable motorized XY stage.
System must haveLED illumination for transmitted light imaging
Must have at least 6 positions in filter wheel turret Must have at least 6 positions on motorized DIC nose piece
System must have the following high resolution, confocal grade (apochromatic) objectives: 10X dry with NA of 0.4 or better 40X with NA of 0.8 or better 60/63X oil with NA of 1.35 or better All objectives must be DIC compatible
In addition to the slide holder, system should include mount for 35 mm petridish.

Laser modules:

Combination of following gas/solid statelasers, with minimum power of 20 mW (higher power will be preferred):

1. 405 nm
2. 488 nm
3. 552/561 nm
4. 630 – 640 nm

Each laser line must have a minimum of10,000 h lifetime. In case of Multiline Ar laser, the minimum power should be 30mW and the company should give warranty of the laser for at least 10,000h. If the laser, or the electronics associated with it, malfunction within this 10000 h working lifetime, it needs to be replaced free-of-cost.

All lasers lines are to be connected to the scan head through fibre optic cable and should be controlled through computer and AOTF for fast laser switching and attenuation, in synchronization with the scanner.

Spectral confocal laser scan head with built-in detectors:

Scanner module must have at least 2 filter-free spectral detectors with independent voltage and offset controls. Of the 2 detectors, at least 1 should be a high sensitive built-in GaAsP detector, or equivalent, with more than 40% QE. The system should be capable of being upgraded to 4 detectors. An additional transmitted light detector should be offered for brightfield and DIC imaging in confocal mode.

The spectral dispersion of the emission light within the scan head should be based on either reflection grating with 32 array detector/transmission grating/prism-based dispersion with highly efficient spectral detectors. The system should be capable of acquiring at least 6fps, at 512 X 512-pixelresolution in spectral mode (without line skipping and interpolation), with full FOV. In absence of this, company may quote their high-speed scanner. Maximum scan resolution should be at least 4K X 4K for all channels; systems with higher scan resolution will be preferred.
Scanner should have a FOV of at least 18 mm.
System should have spectral resolution of at least 5 nm.
Photobleaching/photoactivation/FRET capability should be included within the quoted system.

Control workstation:

System must be controlled with computer control unit having the latest configuration (processor of 3.5 GHz or better, with at least 16 GB RAM, 3 TB SATA hard disc drive, Windows 10 Professional (64 bit) operating system, USB 3.0/2.0, Firewire, NVIDIA 1GB high performance GPU.
OneUltra-HD LED monitor(at least 30”).

Software for system control and imaging:

Software should be capable of controlling all motorized components of microscope, as well as scan head, XYstage, laser control and image acquisition & processing. For the sake of repeatability, it should be capable of saving all system parameter for a given image. It should capable of XY, XYZ, XYZt, XYZtλ imaging. Must be capable of enabling photactivation, FRAP and FRETexperiments. The system should be capable of tile, mosaic and multipoint imaging. Must have capability of making standard geometric measurements such as length, area and angle, including intensity and colocalization measurements. Should allow 3D image reconstruction from a Z-stack image series along with colocalization and histogram analyses with individual parameters. Spectral unmixing and emission fingerprinting should be a standard feature.
At least one offline software must be provided along with the company’s own factory-tested advanced workstation (2 TB, 8GB RAM, 1 GB NVDIA) with 30” monitor.

Ancillary equipment:

The microscope must be place on a suitable importedanti-vibration table. Specifications of table should be provided.
Tables with suitable surfaces must be provided for placing control unit and monitor.

Installation and service support:

System must be under warranty for 3 years. Site preparation to include dehumidification and partitioning such that system is installed in ideal room conditions. System must have power backup with appropriated 5 KVA online UPS system (at least 15 min battery backup) to support complete system. Bidders must clearly state the dimensions of the offered system. Bidders must clearly specify regarding after-sales service and application support capabilities. Bidders must clearly state the installation base of the quoted model in eastern region in last five years,

with contact details of the local in-charge of each instrument. Extensive, with at leastthree separate on-site training sessions for users by the national-level application specialist should be provided. Each session should be at least 3 days duration and will be scheduled as per user's requirement.

1. Superresolution module with lateral resolution of 140 nm or better and axial resolution of 400 nm or better. This resolution should be achieved using completely programmable hardware of the system and online processing. It is preferable if the system capable of taking super-resolution images while live imaging and multiple channels with minimum 2 live channels.
2. IR range LED/laser hardware-based drift compensatorto retain the same focus position in real time for long time lapse imaging (Define Focus, Adaptive Focus control, ZDC or PFS).
3. Deconvolution software based on suitable image restoration algorithms.
4. On stage full-chamber 37ºC CO_2 incubator for live cell imaging
5. Beam Expander for FRAP and photo activation for the vendors who required that for mentioned application.

Optional accessories:

Company should provide separate price quote for each optional accessory item, with part number of the principal.