भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान मोहाली

मानव संसाधन विकास मंत्रालय, भारत सरकार द्वारा स्थापित
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IISERM(1113-3)20/21-Pur Dated :29-06-2020

CORRIGENDUM-I

Refer IISER Mohali E-tender Ref. No. IISERM(1113-3)20/21-Pur for **SUPPLY AND INSTALLATION OF SUPER-RESOLUTION MICROSCOPE FACILITY AT IISER MOHALI** Knowledge City, PO. S.A.S. Nagar, Mohali, Punjab. Due date for the on-line submission is further extended due to **Amendments/addition in Technical specification below schedule**:

Sr. No.	Details of Specifications of the Stores	Qty.
1.	**In the above notice the minor Amendments have been incorporated in ANNEXURE-I (attached). However, the complete documents with revise terms/conditions is provided in the attachment.**	**As per details given in BOQ/Anneuxre-I**

Revised date and Time

Sr. No.	Description	Extended Due date/Time
01	**Closing Date & Time (Online)**	**09-07-2020 upto 11:00 AM**
02	**Opening Date & Time of Technical Bid**	**10-07-2020 upto 11:30 AM**

For any information, other modifications and/or corrigendum may kindly visit IISER Mohali websites http://www.iisermohali.ac.in/ & https:/eprocure.gov.in/eprocure/app

Sd/-
Mukesh Kumar
Assistant Registrar (P&S)

ANNEXURE-I

SUPER-RESOLUTION MICROSCOPY FACILITY AT IISER MOHALI

SUPER-RESOLUTION IMAGING USING SINGLE MOLECULE LOCALIZATION SYSTEM WITH HIGH-RESOLUTION AND SENSITIVE SPECTRAL CONFOCAL WORKSTATION

A super-resolution imaging workstation should include high-resolution and sensitive spectral confocal imaging for fixed and live sample imaging for cell biology/developmental biology applications, protein-protein interactions and imaging of modal organisms. The system should be able to perform single-molecule localization using stochastic optical reconstruction microscopy (STORM) / photo-activated localization microscopy (PALM) and should include multichannel fluorescence imaging with Z-stack, time-lapse including co-localization, fluorescence resonance energy transfer (FRET), fluorescence recovery after photobleaching (FRAP), photo-activation and conversion imaging and analysis. Apart from conventional confocal system the system should be equipped for carrying out a quick high-resolution ($\leq$ 150 nm) imaging that will be needed prior to more involved super-resolution single-molecule localization. The illumination source(s) would be primarily laser-based across the visible spectrum with spectral detection and should be capable of accommodating a wide range of fluorescent dyes. The super-resolution image should be a direct outcome of the microscope and not a mere result of any post-processing. The system should be available with the configuration mentioned below:

A. Motorized Inverted Fluorescence Research Microscope:

a) Fully Motorized Inverted Fluorescence Research Microscope for BF/DIC/phase contrast/Fluorescence preferably with dedicated touch screen TFT display for controlling motorized components of the microscope.
b) Programmable motorized X-Y scanning stage, Universal sample holders for slides, 35/60 mm Petri dish, labtek chambers with multipoint, tile and mosaic imaging software.
c) A fast piezo focusing stage insert for fast z stack imaging with travel range of 100 microns or better.
d) IR LED (840nm Hardware based) focus drift compensation mechanism for long term live cell imaging application should be available as standard with the system and controlled by the software.
e) 12V/100W halogen illumination for transmitted light & 120W metal halide illumination for Fluorescence should be offered.
f) Motorized 6 position DIC nosepiece, Universal Motorized Condenser NA 0.55 or better with modules for DIC, 6 position fluorescence turrets for accommodating fluorescent filters for sample visualization and camera-based imaging.
g) High precision Z-focus drive with step size of 15 nm or better.
h) High resolution confocal grade objectives of 10X/0.4 or better, 20X/0.80, 40x/1.30oil, 60/63x/1.40oil immersion or better for Imaging and SR work. Dedicated TIRF objective 100X/1.46 or better for TIRF and single molecule localization should be offered. Additionally, water immersion 40X/60X (1.20) WD 0.20 mm or better should also be quoted for FCS/FCCS work in cells and solutions.

Amendment: We amend "20X/0.80" to "20X/0.8/0.75"

i) Automated shift free DIC accessories for all objectives.
j) Band pass fluorescent filters for DAPI, GFP and Cy3 should be offered.
k) An active anti-vibration table with compressed air damping, bread board table top with M-6 threading for the complete microscope system.

l) Monochrome cooled CCD camera, 2/3''Chip with 2.6 million or better net effective pixel resolution (FireWire based/USB III) with frame rate of 30 fps or better at full format, controlled by the same confocal software for multichannel, z stack, time lapse wide field imaging. Deconvolution software

Amendment: We amend "CCD camera" to "CCD/CMOS camera"

m) Facility for live cell imaging including Incubation system with Temperature, CO2, humidity control and complete safety regulations should be offered. The parameters for Incubation system should be controlled by confocal software.

n) Dedicated attachment for converting Inverted Microscope to Upright Microscope for Tissue Imaging with depth up to 200 microns or better (depending on transparency of samples). Additionally, one Water Dipping 20/25X and 60X, NA 1.0 and WD of 2.1mm or better for deep tissue imaging should be incorporated.

B. Spectral confocal imaging unit with built-in highly sensitive detectors:

a) Laser point scanning and Confocal detection unit with built-in Spectral PMT and HyD/GaAsP Spectral detectors. All detectors should be capable of working in Intensity and Spectral mode Imaging. Should be capable of simultaneous detection and separation of minimum 4 fluorophores or more based on high-sensitivity GaAsP/HyD or equivalent detectors with QE 45% or more.

b) Scanner unit should have laser ports for Vis, UV and IR lasers. It should include highly efficient excitation laser suppression beam splitting device with low angle of incidence dichorics.

c) The scanner should have real "ROI" scan capability for fast scan. Maximum scan resolution should be at least 4K x 4K or better per channel and should reduce to 16X16 resolution.

Amendment: We amend "real ROI scan capability" to "real ROI scan capability/ROI scan capability in real time".

d) Scan speed should be 12 - 15 fps or better @ 512x512. The scan head should be able to perform fast dynamic live cell time lapse imaging with a high speed of at least 200 fps or better @512X 32 resolution.

Amendment: We amend "12 - 15 fps" to "10-15 fps".

e) Transmitted PMT for laser based DIC imaging should be included.

f) The scan field diagonal should be 18 mm or better. Scan Zoom range 1X to 40X with increments of 0.1X.

C. Laser module with AOTF control:

The following laser lines are needed 405 nm, 445 nm, 488 nm, 515 nm, 561 nm, 594 nm and 640 nm (preferably solid-state lasers).

All visible & UV 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 Real 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.

Amendment: We amend "Real ROI scan" to "Real ROI scan/ROI scan in real time".

D. FCS/FCCS system for single molecule detection: Based on minimum 2 channel FCS/FCCS with high sensitivity and minimum after pulsing. The FCS unit should perform auto and cross correlation measurements in live cells and solution for a wide range of dyes and proteins. The unit should have the facility for elimination/suppression of other excitation laser lines. All laser lines for confocal imaging should be capable of working in FCS/FCCS mode. FCS measurement software for auto- and cross-correlation capabilities should be quoted. System should also be included with POL Anisotropy accessories to perform quantitative anisotropy experiments and should be duly supported by literatures and references.

E. Real-time Online High-Resolution Imaging:

a) Fully automated, real-time and Online SR attachment with suitable sensitive detectors for complete visible spectrum.
b) Should be able to achieve Lateral resolution of 120-150 nm and axial resolution of 350 - 450nm.
c) The system should be capable of working with cell culture, cell lines, modal organisms and tissues with depth of penetration of 100 microns or more.
d) Frame rate in SR mode should be 15 fps or better.
e) Should be capable of simultaneous dual-color imaging in SR mode.

F. Single Molecule Localization System (STORM / PALM) (for Proteins, organic dyes and fluorophores)

a) STORM / PALM for single molecule localization to achieve resolution down to 20 nm or better in XY and 130 nm in Z (TIRF regime). Should be supported for all laser lines in the spectral region.

b) Acquisition in various modes i.e. localization, single particle tracking, fiducial correction, activation power controlled, Wide field, TIRF imaging, HILO mode and ultra-high TIFR modes should be available.

c) On-line processing for on-the-fly PALM/STORM analysis. Data should become available as the images are being acquired.

d) Image based auto focussing and activation power ramp. Frame time in tracking down to 40 ms. Multi-channel or multi-color acquisition in a sequential mode should be possible for applications in Cytoskeleton, Focal adhesions, Membrane organization, Vesicle transport and organelle architecture.

e) Pixel-by-pixel overlap calibration and sample independent drift compensation by fiducial tracking on all detection channels.

f) Dedicated high sensitivity EMCCD camera for single molecule imaging with 512X512 pixel resolution and QE of 95% with frame rate of 55 fps or better at full format, TE cooling of -100 °C, 16 µm X 16 µm pixel size for best sensitivity coupled to the camera port of the microscope.

g) Laser module with AOTF control for Single Molecule Localization System:

High-power solid-state lasers 488 nm (100 mW or better for Ax 488, GFP, FITC fluorophores), 561 nm (100 mW or better for TRITC, Rhodamine, Texas Red, Cy3, Ax 546), 405 nm (50 mW or better for DAPI,

Hoechst dyes), 640 nm (100mW or better for Ax 647, Cy5, Dil, DIO). All the laser lines should be controlled through a computerized AOTF device for fast laser switching and attenuation.

G. Control computer and Monitor:

Latest 64-bit control computer with Intel Xeon 6 Core Processor, DDR RAM 64 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" LCD/ TFT monitor.

H. System control and Imaging Software:

a) Software should be capable of controlling Motorized components of microscope, digital camera, confocal scan head, laser control including AOTF and Image acquisition & processing for confocal and super resolution imaging.
b) Saving of all system parameters with the image for repeatable/reproducible imaging.
c) Line, curved line, frame, Z-stack, Time series imaging capabilities.
d) Real ROI bleach for FRAP, Photo-activation/conversion experiments.

Amendment: We amend "Real RO bleach" to "Real ROI bleach/ROI bleach in real time".

e) FRET imaging as well as Quantitative data analysis capability.
f) Standard geometry measurements like length, areas, angles etc including intensity measurements.
g) Advanced 3D image reconstruction with rendering from a Z-stack image series.
h) Co-localization and histogram analysis with individual parameters.
i) Spectral un-mixing with fingerprinting for separation of overlapping excitation/emission spectra of fluorophores.

Amendment: We amend "fingerprinting" to "fingerprinting/real time unmixing".

j) Image acquisition and processing tolls for SR with various modes of visualization/ analysis tools should be available.
k) Additional Offline software with complete features as the main software with high end dedicated PC and monitor (same specs as main PC) should be available.

Note:

1. Bidders should clearly specify the after sales service/application support capabilities without any additional cost.
2. Warranty for the complete system and additional 4 years AMC should be included.
3. Provide all information as regards pre-installation requirements (i.e. room, environment) for system installation.
4. Online UPS for the complete system including lasers should be included in the supply. The system should have a dedicated online branded UPS system with at least 30 min back up for the whole system.
5. Onsite training should be available.