(राष्ट्रीय पशु जैव प्रोद्योगिकी संस्थान)

National Institute of Animal Biotechnology

Corrigendum -- Change of Date & Specifications

Please refer NIAB Tender Details as follows. Tender ID : 2018_DBTEC_419126_1

Tender Reference Number : NIAB/SP/2018-19/81

Tender Title : Super Resolution Microscope

The following changes may please be noted before submission of bids with respect to the tender details mentioned bove.

In place of old dates mentioned in Tender , please consider following dates.

Document Download End Date :- in place of Existing old date --- Read As :- 09/01/2019

Bid Submission End date : in place of Existing old date --- Read As :- 09/01/2019

Bid Opening Date in place of Existing old date --- Read As :- 10/01/2019

Revised /New changes in specifications

Specificaton in place of Existing old specifications --- Read As : - Annexure -1 (as attached below)

The specification mentioned below should be treated as revised specification and bid must be submitted accordingly.

Rest of the tender conditions remains same.

Manager (S&P)
NIAB-Hyderabad
Date:- 03/01/2019

Tender No- NIAB/SP/2018-19/81

# Change of Specification	**Annexure - 1**

Specification No.	**Existing Specification**	**Modified Specification**
Name of the Item	HIGH RESOLUTION & SENSITIVE SPECTRAL CONFOCAL WORKSTATION WITH SUPERRESOLUTION IMAGING	HIGH RESOLUTION & SENSITIVE SPECTRAL CONFOCAL WORKSTATION WITH SUPERRESOLUTION IMAGING
1	The imaging workstation should include high resolution & sensitive spectral confocal imaging for fixed and live sample imaging for cell biology applications, protein-2 interactions and imaging of modal organisms. The system should include multichannel Fluorescence imaging with Z-stack, time-lapse including co localization, FRET, FRAP , Photo activation and conversion imaging & analysis The system should be available with the below mentioned configuration:	

A. Motorized Inverted Fluorescence Research Microscope

a)	Fully Motorized Inverted Fluorescence Research Microscope for BF/DIC/Fluorescence preferably with dedicated touch screen TFT display for controlling motorized components of the microscope.	Fully Motorized Inverted Fluorescence Research Microscope for BF/DIC/Fluorescence with or without touch screen 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.	Programmable motorized X-Y scanning stage, Universal sample holders for slides, 35/60 mm Petri dish, labtek chambers, multi well chamber (36 and 98 well) adopters 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.	A fast piezo/Galvo focusing stage insert for fast z stack imaging with travel range of 100 microns or better.
d)	IR LED (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.	12V/100W halogen or LED 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 turret for accommodating fluorescent filters for sample visualization and camera based imaging.	Motorized 6 position DIC nosepiece, Universal Motorized Condenser NA 0.52 or better with modules for DIC, 6 position fluorescence turret 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.	High precision Z-focus drive with step size of 15/20 nm or better with piezo/galvo

h)	High resolution confocal grade objectives of 10X/0.4 or better, 20X/0.75, 40x/1.30oil, 60/63x/1.40oil immersion or better for Imaging and SR work. Additional 100X/1.40 oil immersion should be offered optionally.	High resolution confocal grade objectives of 10X/0.4 or better, 20X/0.75, 40x/1.30oil, 60/63x/1.40oil immersion or better, dedicated 100X/1.40 oil immersion for Imaging and SR work.
i)	Automated shift free DIC accessories for all objectives	DIC accessories for all objectives.
j)	Band pass fluorescent filters for DAPI, GFP, Cy3 and Cy5 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)	Optionally quote for Monochrome cooled CCD camera, 2/3''Chip with 2 million or better net effective pixel resolution (FireWire based/USB III) controlled by the same confocal software for multichannel, zstack, time lapse wide field imaging. (Quoted optionally)	Optionally quote for **Monochrome cooled CMOS/CCD camera with 1.4 million or better net effective pixel resolution** (FireWire based/USB III) controlled by the same confocal software for multichannel, z stack, time lapse wide field imaging. (Quoted optionally).
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	

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

B. Confocal imaging unit with **built-in or separate** high 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 5 fluorophores. Out of same minimum 4 fluorophores should be imaged on high sensitive GaAsP/HyD or equivalent detectors with QE 45% or more and remaining with PMT.	Laser point scanning and confocal detection unit **with built-in/separate PMT and HyD/GaAsP detectors**. **All detectors should be capable of working in Intensity and Spectral mode Imaging**. Should be capable of simultaneous detection and **separation of minimum 4/5 fluorophores**. **Out of same minimum 2 fluorophores should be imaged on high sensitive GaAsP/HyD or equivalent detectors with QE 45% or more and remaining with PMT.**
b)	Scanner unit should have laser ports for Vis, UV and IR lasers. It should include high efficient excitation laser suppression beam splitting device with low angle of incidence dichorics.	Scanner unit should have laser ports for UV,Vis, and IR lasers or 405, Vis and IR. It should include high 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 6Kx6K or better per channel and should reduce to 16X16 resolution.	The scanner should have ROI scan capability for fast scan. Maximum scan resolution should be at least 4Kx4K or better per channel and should reduce to 64X64 resolution.
d)	Scan speed should be 7-10 fps or better @ 512x512. The scan head should be able to perform fast dynamic live cell time lapse imaging with a high speed of 200 fps or better @512X 32 resolution.	Scan speed should be 7-10 fps or better @ 512x512. The scan head should be able to perform fast dynamic live cell time lapse imaging with a high speed of **100 fps or better @512X 32/64 resolution.**
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: **C. Laser module with AOTF control: Gas/Solid**

a) b) c) d) e)	Blue diode (UV) Laser 405/408nm. Laser line for 458/488/514nm. Laser for 543nm. Laser 594 nm. Laser 633 nm.	Gas/Solid Laser with 5 year Warranty Blue diode (UV) Laser 405/408nm.With **30mW or above** Laser line for 458/488nm. With **20mW or above** Laser for 514nm. With **20mW or above** Laser 561 nm. With **20mW or above** Laser 633 nm. With **10mW or above** Laser 594nm. (optional)
	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.	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 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.

D. FCS system for single molecule detection: **D. Optional TCSPC/ FCS/FCCS system for single molecule detection:** (Price will be used for comparisons)

	Based on Minimum 2 channel GaAsP or APD's for 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. Dedicated Plan Apo 40x/1.2 water should be offered with the system. FCS measurement software for auto and cross correlation capabilities should be quoted. System should be included with POL Anisotropy accessories to perform quantitative anisotropy experiments and should be duly supported by literatures and references	Based on Minimum 2 channel GaAsP or APD's for TCSPC/FCS/FCCS with high sensitivity and minimum after pulsing. The TCS/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 TCS /FCS/FCCS mode. Dedicated Plan Apo 60x/1.2 or 63x/1.4 Oil should be offered with the system. TCS/FCS measurement software for auto and cross correlation capabilities should be quoted. System should be included with POL Anisotropy accessories to perform quantitative anisotropy experiments and should be duly supported by literatures and references

E. Realtime High Resolution Imaging : **E. Real-time Super Resolution Imaging with hardware attachment of SIM/Airy scan/STED**

	Fully automated , realtime and Online HR attachment with suitable high sensitive Detectors for complete Vis Spectrum.	Fully automated, real-time and **Online/offline SR attachment hardware SIM/Airy scan/STRD** with suitable high sensitive Detectors for complete Vis Spectrum.
	The system should be able to work in HR mode, Virtual Pinhole mode for better sensitivity and Confocal Mode for normal imaging.	The system should be able to work in SR mode, Virtual Pinhole mode for better sensitivity and Confocal Mode for normal imaging.
	Should be able to achieve Lateral resolution of 120-150 nm and Axial resolution of 350 - 450nm.	
	Detection should be based on GaAsP or high sensitive detectors.	
	At least 2 fluorophores imaging in simultaneous mode should be possible with the SR system. Any dye used for confocal system can be used for imaging without changing sample preparation techniques/protocol. Should be able to perform at least 4 fluorophores imaging in sequential mode.	
	Should be able to perform live cell HR Imaging. All laser lines for Confocal	Should be able to perform live cell SR Imaging. All laser lines for Confocal Imaging should be used for imaging in SR mode.

	Imaging should be used for imaging in SR mode.	
	Frame rate of 15 fps@512X512 or better and should improve to 100 fps @512X16 and ROI in HR mode without compromise on the lateral and axial resolution mentioned above.	Frame rate of 7/10 fps@512X512 or better and should improve to 100 fps @512X64 and ROI in SR mode without compromise on the lateral and axial resolution mentioned above.

F. Control computer and Monitor:

	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" LCD/ TFT monitor.	Latest 64 bit control computer with Intel Xeon 6/10 Core Processor, DDR RAM 64 GB HDD: 8 TB SATA upgradable to better, DVD, SuperMulti SATA +R/RW, Graphics : 4GB graphics card, Gigabit Ethernet, Win 7 Ultimate 64 bit , USB 2.0, Fire wire. Large 32" LCD/ TFT monitor.

G. 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.	ROI bleach for FRAP, Photo-activation/conversion experiments.
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.	

j)	Image acquisition and processing tolls for SR, VP images with various modes of visualization with tools should be available.	Image acquisition and processing tolls for SR, images with various modes of visualization with tools should be available.
k)	Additional Offline software with complete features as the main software with high end dedicated PC and monitor should be made available.	

H. Single Molecule Localization System **H. Single Molecule Localization System/ STED SR**

	Single Molecule Localization System attached to the LSM system (for Proteins , organic dyes and fluorophores) PAL-M/ STORM for single molecule localization to achieve resolution down to 20 nm or better in XY and 130-140nm in Z. Should be supported for all laser lines in the UV/Visible region. Acquisition in various modes i.e. localization, single particle tracking, fiducial correction, activation power controlled, Widefield and TIRF imaging modes should be available. On-line processing for on-the-fly PALM/dSTORM analysis. Data should become available as the images are being acquired. 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 organisation, Vesicle transport and organnel architecture. Pixel-by-pixel overlap calibration and sample independent drift compensation by fiducial tracking on all detection channels. Dedicated high sensitivity EMCCD camera for super resolution imaging with at least 512X512 pixel resolution and QE of 90% or more coupled to the camera port of the microscope. The system should be able to use a wide range of available fluorescent proteins as well as organic dyes (photoactivable, photo convertible and photochromic) for working	Single Molecule Localization System attached or independent to the LSM system (for Proteins , organic dyes and fluorophores) PAL-M/ STORM / STED for single molecule localization to achieve resolution down to 20 nm or better in XY and 50-140nm in Z. Should be supported for all laser lines in the UV/Visible region. Acquisition in various modes i.e. localization, single particle tracking, fiducial correction, activation power controlled, Widefield and TIRF imaging modes should be available. On-line / Real time processing for on-the-fly PALM/dSTORM / STED analysis. Data should become available as the images are being acquired. 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 organisation, Vesicle transport and organnel architecture. Pixel-by-pixel overlap calibration and sample independent drift compensation by fiducial tracking on all detection channels. 2 Dedicated high sensitivity EMCCD/ SCMOS camera for super resolution imaging with at least 512X512 pixel resolution and QE of 90% or more coupled to the camera port of the microscope. The system should be able to use a wide range of available fluorescent proteins as well as organic dyes (photoactivable, photo convertible and photochromic) for working with the system. Photoactivation controls and processing tools for PALM / STORM should be available.

	with the system. Photoactivation controls and processing tools for PALM / STORM should be available.	In case of STED Fully automated beam alignment Software based Switch between confocal and STED Two colour simultaneous STED SR

Laser module with AOTF control for Single Molecule System:

	High power solid state lasers 488nm (100 mW or better for Ax 488 , GFP, FITC fluorophores), 561nm (100 mW or better for TRITC, Rhodamine, Texas Red, Cy3, Ax 546), 405nm (50 mW or better for DAPI, Hoechst dyes), 640nm (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.	

Note / Other Important Points

	Bidders should clearly specify the after sales/service/application support capabilities. Warranty for the complete system. Provide all information as regards pre-installation requirements (i.e. room, environment) for system installation. Online UPS for the complete system including lasers should be included in the supply. Detailed list of users of the system in India with contact details to be provided. Onsite Training for personnel should be made available	Bidders should clearly specify the after sales/service/application support capabilities. 5 Year Warranty for the complete system. Provide all information as regards pre-installation requirements (i.e. room, environment) for system installation. Online UPS for the complete system including lasers should be included in the supply. Detailed list of users of the system in India with contact details to be provided. Minimum 2 installations in India are required Onsite Training for personnel should be made available Training: In-depth service training on the functioning, repair and maintenance of the system for one instrumentation personnel from NIAB to be provided at the manufacturers facility including travel, lodging and boarding etc all cost.